

DISTANCE EDUCATION STUDENTS' EXPERIENCES OF
ONLINE INTERACTION AT A RURAL-BASED UNIVERSITY

by

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DECLARATION

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I declare that the above title thesis is my own work and that all the sources that I have used or quoted have been indicated and acknowledged by means of complete references.

I further declare that I submitted the thesis to originality-checking software and that it falls within the accepted requirements for originality.

I further declare that I have not previously submitted this work, or part of it, for examination at UNISA for another qualification or at any other higher education institution.

A handwritten signature in black ink, appearing to read 'Maphosa', with a stylized, scribbled initial 'M'.

10 January 2023

SIGNATURE

DATE

KEY TERMS

Title of thesis

Distance education students' experiences of online interaction at a rural-based university

Key Terms

Distance education. Online learning. Online interaction. Online courses. Course instructors.

DEDICATION

They possessed that rare gift of seeing the end from the beginning—the true embodiments of unconditional love, indescribable selflessness and immense sacrifice. Rest in eternal peace, my heroes and heroines: Robson "Faustino", Nicholas "Gadzirayi", Marble "Ntombelanga" and Christina Charity "Fadzai".

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ABSTRACT

Online teaching and learning are consistent with the current generation of Open and Distance e-learning, which emphasises utilising available technologies to enhance teaching and learning in flexible and convenient ways. However, online teaching and learning were hastened in most developing contexts by COVID-19, hence its numerous challenges. One of the challenges associated with online learning is the lack of meaningful interaction, which impacts online learning experiences and, invariably, student attainment. The present study aimed to explore the distance education students' experiences of interaction in online learning at a rural-based university in Eswatini. Underpinned by two theories, connectivism and the Community of Inquiry framework, the study was in the post-positivist research paradigm. The study followed a mixed-methods research approach and utilised a concurrent-triangulation design. A stratified random sample of 361 students was selected to respond to a structured questionnaire that was administered online. For the study's qualitative aspect, data from four focus groups of ten students each were collected utilising a focus group discussion technique. A purposive sampling technique was used to choose the focus group discussion participants who were considered "information-rich sources" from four programmes with the most active courses on the Moodle Learning Management System. Quantitative data was analysed using SPSS version 29. Descriptive statistics were utilised in analysing data to respond to the sub-research questions in answer to the main research question. A thematic content analysis approach was employed to analyse qualitative data from the focus group discussions. The quantitative and qualitative results were merged at the analysis and interpretation stage. According to the study results, students had a positive view of online interaction but did not include using technology in their understanding of the concept. The study also found that despite technological issues, students profited from online interaction in many ways. Students were generally not given sufficient guidance or support regarding the various facets of the online learning system. The study also identified several elements that encouraged online engagement and some factors that hampered it. It was established that while some online teaching techniques were more frequently used in online learning, others were less so. The implications for online pedagogy were that while using rare approaches could raise the quality of online contact, using standard methods often promoted lower-order forms of interaction. The study concludes that although students positively perceived what online interaction encompassed, they did not include technological interaction in their understanding of it. The study also concludes that students benefited much from online interaction. Still, they did not benefit from fully utilising the LMS features and the affordances of their devices, which were considered hindrances. It is further concluded that a general lack of training and support was provided to students regarding the various aspects of the online learning system. The study further concludes that there were factors found to be crucial in positively affecting online interaction. However, several factors negatively affected online interaction. It is concluded that there were pedagogical shortcomings in online facilitation that would favour improved online interaction quality and the

attainment of higher-order learning objectives. The study's findings led to a proposed framework for an online teaching and learning agenda in a developing context. The framework is premised on addressing resource and skills gaps for course facilitators and students, underpinning online teaching and learning in scholarly instructional design approaches, online support, and online teaching and learning monitoring.

Keywords: Distance education. Online learning. Online interaction. Online courses. Course instructors.

MANWELEDZO

U funza na u guda nga kha lubuvhisia zwi elana na murafho wa zwino wa u guda nga lubuvhisia ho vuleaho u kule, zwine zwa khwaṭhisedza tshumiso ya thekhinoḽodzhi dzi re hone u Okhwaṭhisedza u guda na u funza hu tendelanaho na na ndila dzo teaho vhatu. Fhedzi, u dzheniswa ha u funzwa na u guda nga lubuvhisia zwo ṭavhanyedziswa kha dziṅwe nyimele nga u bvelela ha COVID-19, zwe zwa bveledza khaedu dzo vhalaho, hu tshi katelwa u shayea ha vhukwamani vhu pfadzaho, zwi re na masiandaitwa kha tshenzhelo dza u guda, kanzhi, vhukoni ha matshudeni.

Ngudo iyi yo sedza kha tshenzhelo dza matshudeni a pfunzo ya kule dza vhukwamani ho sedzeswa u guda nga lubuvhisia kha yunivesithi ya vhupo ha mahayani ngei Eswatini. Kusedzele kwa nga murahu ha vhasedza zwivhuya kwo ṭoka midzi kha vhuṭumani na thyeori dza muhanga wa tshitshavha tsha ṭhoḽisiso. Ngudo dzo tevhedza kusedzele kwa ngona dza ṭhoḽisiso dzo ṭanganelanaho na u shumisa nyolo ya ṭhofunderaru yo sedzaho zwoṭhe nga luthihi. Tsumbo nanguludzwa tshaya ndivhiswa yo dzidzanywaho ya matshudeni vha 361 yo nangiwa u itela u fhindula mbudzisombekanywa dzo ṅekedzwaho nga lubuvhisia. Thekiniki ya u nanguludza ire na ndivho yo shumiswa u nanga vhadzheneli vha tshigwada tsho sedzwaho, vhe vha dzhiwa sa “zwiko zwo ḽalaho mafhungo”, u bva kha mbekanyamushumo dzi re na khoso dzi shumesaho kha sisiteme ya ndangulo ya u guda ya Moodle (LMS). Data ya khwanthithethivi (yo sedzaho ndeme) yo senguluswa hu tsh shumiswa vesheni ya SPSS ya vhu 29, na kuitele kwa musaukanyo wa zwi re ngomu nga thero kwo shumiswa u saukanya data ya khwanthithethivi u bva kha therisano dza zwigwada zwo sedzwaho. Mvelelo dza khwanthithethivi na dza khwalithethivi dzo ṭanganyiswa musi wa musaukanyo na ṭhalutshedzo.

U ya nga ha mvelelo dza ngudo, matshudeni o vha na kuvhonele kwavhuḽi kwa vhukwamani fhedzi a vho ngo katela thekhinoḽodzhi kha kupfesesele kwavho kwa muṭalukanyo, matshudeni vho vhuvelwa u bva kha vhukwamani ha lubuvhisia nga naho ho vha na vhukondḽi ha thekhinoḽodzhi, hu tshi katelwa u sa shumisa zwishumiswa zwa eḽekithironiki na u sa wana vhugudisi na thikhedzo zwo linganaho u nva kha LMS dza kha lubuvhisia. Ho wanala uri musi hu khou shumiswa maitete a songo dowealeho hu na takulwa vhukwamani nga kha lubuvhisia, u shumisa ngona dzo ḽowealeho kanzhi zwo bveledza tshivhumbeo tsha vhukwamani ha fhasi. Ho khunyeledzwa uri vhuṭudzeṭudze ha pfunzo kha u tshimbidza zwithu nga lubuvhisia vhu tea u lavheleswa u itela u khwiṅisa vhukwamani ha lubuvhisia na u swikelela zwipikwa zwa nṭha zwa u guda. Mawanwa a ngudo o livhisa kha muhanga wa kushumele wo dzinginywaho u itela adzhenda ya u funza na u guda nga kha lubuvhisia kha nyimele l bveledzaho. Muhanga wa kushumele wo sedza kha u livhana na zwishumiswa na mavhaka a zwikili zwa vhatshimbidza khoso na matshudeni, zwi livhanaho na u funza na u guda nga kha lubuvhisia kha kuitele kwa nyolo dza ndaela dza vhorapfunzo, thikhedzo ya kha lubuvhisia, na u vhulavhelesi ha u funza na u guda nga kha lubuvhisia.

Maipfi a ndeme: Pfunzo ya kule, u guda nga lubuvhisia, vhukwamani nga kha lubuvhisia, khoso dza kha lubuvhisia, vhatshimbidza khoso.

UMXHOLO

Ukufundisa nokufunda ngonxibelelwano nge-Intanethi kuyahambelana nesizukulwana sangoku sokufunda okuvulekileyo kunye nokumgama i-e-learning, egxininisa ukusetyenziswa kobugcisa obukhoyo ukuphucula ukufundisa nokufunda ngeendlela eziguquguqukayo nezifanelekileyo. Nangona kunjalo, ukumiselwa kokufundisa nokufunda nge-intanethi kuye kwakhawuleziswa kwezona meko ziphuhlayo nge-COVID-19, okubangele imingeni emininzi, kuquka ukunqongophala konxibelelwano olunentsingiselo, olunefuthe oluchaphazele amava okufunda kwi-intanethi kwaye, ngokungaguququkiyo, ukuphumelela kwabafundi.

Olu phononongo lwalujolise ekuphononongeni amava abafundi bemfundo ekumgama yokunxibelelana nokufunda nge-intanethi kwiyunivesithi esekwe emaphandleni eEswatini. Uphando olwenziwe emva kwembono okanye isethi yezimvo zophando ezingqineke zifanelekile zamkelwa, *i-paradigm* zaxhaswa yimbono esekelwe kwingcamango esiyifundayo xa sinxibelelwana, okanye sakha amakhonkco onxibelelwano ngolwazi, kwaye siqhubeka nokwenza nokugcina unxibelelwano ukuze senze ulwazi kunye noluntu lweethiyori zesakhelo sophando iconnectivism. Uphononongo lulandele indlela yophando oluxubeneyo kwaye lusebenzise uyilo oluhambelanayo olunxantathu.

Isampula ehleliweyo yabafundi abangama-361 yakhethwa ukuba iphendule kwiphepha lemibuzo eyakhiweyo eyayenziwe ilawulwa kwi-intanethi. Ubuchule bokusampula obunenjongo busetyenziswe ekukhetheni abathathi-nxaxheba bengxoxo yeqela ekuza kugxininiswa kubo, ababethathwa “njengemithombo yolwazi olutyebileyo”, besuka kwiinkqubo ezine ezinezifundo ezisebenza kakhulu kwinkqubo yolawulo lokufunda iMoodle (LMS). Idatha yobungakanani yacazululwa kusetyenziswa i-SPSS version 29, yaze indlela yokuhlalutya umxholo wengxoxo yasetyenziswa ukuhlalutya idatha esemgangathweni evela kwiingxoxo zeqela ekugxininiswa kulo. Iziphumo zobungakanani kunye nomgangatho ziye zadityaniswa kwinqanaba lokuhlalutya kunye nokutolika.

Ngokweziphumo zophononongo, abafundi babenembono eyakhayo, nelungileyo yokunxibelelana kwi-Intanethi kodwa abakuqokanga ukusebenzisa itekhnoloji ekuqondeni kwabo lo ngcamango. Abafundi baye bazuza kunxibelelwano lwe-intanethi ngeendlela ezininzi ngaphandle kwemiba yetekhnoloji, kubandakanya ukungasebenzisi izixhobo zabo zombane ngokupheleleyo nokungafumani uqeqesho nenkxaso eyaneleyo kwi-LMS ekwi-intanethi. Kwathi kwacaca ukuba ngelixa ukusebenzisa iindlela ezingabileyo kunokuphakamisa umgangatho woqhagamshelwano kwi-intanethi, ukusebenzisa iindlela ezisemgangathweni bezihlala zikhuthaza iindlela eziphantsi zokusebenzisana. Kwagqitywa kwelokuba ukusilela-ngokwezokufundisa kuququzelelo lwe-intanethi kufuneka kuqwalaselwe ukuze kuphuculwe umgangatho wonxibelelwano nge-intanethi kunye nokufikelela kwiinjongo zokufunda ezikumgangatho ophezulu.

Iziphumo zophononongo zikhokelele kwisakhelo esicetyiswayo se-ajenda yokufundisa nokufunda kwi-intanethi kwimeko ephuhlayo. Esi sakhelo sisekwe ngenjongo yokujongana nezibonelelo kunye nezikhewu kwizakhono kubaququzeleli bezifundo nabafundi, ukuxhasa ukufundisa nokufunda nge-intanethi kwiindlela zoyilo lokufundisa, inkxaso ye-intanethi, kunye nokubeka esweni ukufundisa nokufunda kwi-intanethi.

Amagama angundoqo:

Distance education- Imfundo ekumgama
online learning - ukufunda ngokusebenzisa-intanethi
Online interaction- unxibelelwano nge-intanethi,
Online courses - izifundo eziqhutywa kwi-intanethi,
course instructors - abahlohli bezifundo
framework -imithetho, iingcamango, iinkcukacha ozisebenzisayo ukujongana
neengxaki okanye ukwenza isigqibo.

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ACRONYMS

ACRONYM	FULL MEANING
AU	African Union
CoI	Community of Inquiry
COVID-19	Coronavirus disease 2019
ESHEC	Eswatini Higher Education Council
HE	Higher Education
ICT	Information and Communication Technology
IDE	Institute of Distance Education
FGD	Focus Group Discussion
LMS	Learning Management System
MMR	Mixed Methods Research
MoET	Ministry of Education and Training
ODL	Open and Distance Learning
ODeL	Open and Distance e-Learning
OER	Open Educational Resources
RPL	Recognition of Prior Learning
SADC	Southern African Development Community
SMS	Short message service
SPSS	Statistical Package of Social Sciences
TBL	Team-based learning
UNISA	University of South Africa
UNESWA	University of Eswatini
VR	Virtual Reality

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CHAPTER ONE

ORIENTATION AND OVERVIEW OF THE STUDY

1.1 INTRODUCTION

The COVID-19 pandemic and the resultant restrictions on physical gatherings to curb the coronavirus spread prompted many higher learning institutions in Southern Africa to transition to online teaching and learning (Mpungose, 2020). However, as Bao (2020) notes, most institutions were forced by the pandemic to offer studies online without familiarity with the new mode of delivery. The University of Eswatini was one of the institutions that transitioned to online teaching and learning. The University had a long-established blended learning policy, which needed to be adequately implemented. The COVID-19 pandemic triggered the quick and somewhat abrupt implementation of the policy. Online teaching and learning were conducted through the Moodle learning management system. Implementing online learning involved training course instructors in the different aspects of online programme design and development and online pedagogies. Traditional courses offered through the face-to-face mode of delivery were offered online. The Institute of Distance Education at the University of Eswatini, responsible for offering academic programmes through the distance learning delivery mode, led the entire University to transition to online learning.

Teaching and learning in a traditional face-to-face setup are remarkably different from online teaching and learning (Baber, 2020; Basilaia & Kvavadze, 2020). Therefore, the transition to online teaching and learning faced many teething problems. The issue of interaction is easy to plan for and implement in face-to-face teaching but is a challenge in online teaching and learning. It has been observed to be difficult for course instructors to facilitate meaningful and effective interaction with students in virtual classrooms because they are accustomed to physical classroom teaching (Ferri et al., 2020). It is also important to note that with adequate interaction in learning, students are allowed rich learning experiences, which is essential for attaining the set learning outcomes. Interaction is 'pivotal' in any mode of delivery in teaching and learning (Kumar et al., 2021, p.1). Perceptions exist that online learning environments lack interaction compared to traditional classrooms, which are perceived to be

characterised by a high level of physical interaction (Baber, 2021; Lasfeto, 2020). Hence, the purpose of the proposed study was to establish the distance education students' experiences of interaction in online learning.

1.2 BACKGROUND TO THE STUDY

Online learning can be defined as learning that takes place over the Internet (Jinyoung, 2020). Such learning utilises a learning management system (LMS), an online learning platform where all aspects of teaching and learning occur. Promoting and sustaining student interaction is a critical aspect of online learning. The students' interaction in online learning occurs when students interact with the course instructor, peers, or course content (Mehall, 2020). Similarly, Oraif and Elyas (2021) note that the students may be physically 'distant' but digitally 'close' through online learning. Interaction in online learning brings about closeness. Eder (2020) notes that interaction in online learning advances active and collaborative learning. Students take control of their learning by actively engaging with others in the learning process. The importance of effective interaction in online learning is underscored by Kumar et al. (2021), who view it as a quality standard for online teaching and learning. This shows that effective teaching and learning online should involve students as they learn collaboratively.

Interaction in online learning also allows the students to feel connected and reduce feelings of isolation often associated with distance learning (Razali et al., 2020). As students utilise the available learning platforms, opportunities are made available to bridge the virtual spaces by engaging and working with other students. The quality of interaction in online courses influences the completion of the courses and the attainment of learning outcomes (Baber, 2020; Yunusa & Umar, 2021). Course designers and instructors should ensure that there is interaction in online courses and that the interaction is high quality.

Interaction in online learning is hinged on collaborative learning, generally defined as providing opportunities for two or more people to learn together (Hadwin et al., 2018; Surma & Kirschner, 2020). Regarding collaborative learning, Dhawan (2020) notes that online learning platforms should not be mere repositories for content. Instead, students should be allowed to actively engage with others as they co-create and share knowledge online. Active learning through carefully designed online collaborative

learning activities fosters students' understanding and enriches the online learning experience.

Participation is also an integral element of interaction, and in online learning, the students should participate fully in the learning process. A significant relationship exists between the students' success and their participation in online learning, as noted by "participation is key to learning" (Nieuwoudt, 2018, p. 53). This suggests that students who actively participate in online learning by interacting with fellow students stand a better chance of achieving the set learning outcomes compared to those who do not participate. As explained by Song et al. (2019), online student participation is a complex process of engaging in online learning activities, which should result in active and high levels of participation for meaningful learning. Online learning participation is a critical element of interaction in online learning. It is, therefore, essential to ascertain the nature and extent of student participation in online learning activities.

Interaction in online learning may also be viewed from the angle of engagement. Students' levels of engagement in higher education should be very high to achieve the set learning outcomes (Farrell & Brunton, 2020). Student engagement involves the extent to which students are willing to pursue different and complex learning tasks and, in the process, transform into active and self-directed students (Martin & Bolliger, 2018). Better and heightened engagement in online learning results in increased student success.

Online learning environments should promote students' social interaction, which is prevalent in face-to-face teaching and learning environments. Social intimacy linked to social interaction should be provided at the beginning and during the online course (Baber, 2020). Such social interaction assists students to feel part of a human environment in a course offering. An online learning environment with no social interaction frustrates the students (Wut & Xu, 2021). When students experience social presence in the learning process and are active in a social group, it aids their satisfaction in online learning (Razali et al., 2020). However, students should possess the required digital literacy skills to be fully involved in online activities involving them and fellow students.

Interaction is also necessary in advancing specific pedagogical approaches in the online facilitation of learning. Interaction entails students working reciprocally to achieve the desired learning outcomes, and in the process, the students assist each other and learn from each other (Hastuti et al., 2020). Furthermore, interaction is vital in investigative learning (Hussin et al., 2019). Such a pedagogical approach thrives on involving students in teamwork, where they may work together on a project. Through interaction, online students learn by solving problems and engaging in projects (Aslan, 2021). This involves the students working together to investigate authentic problems. The approach teaches students to follow precise steps in solving a problem while clearly defining the team members' roles in the investigation.

Interaction is an essential aspect of collaborative online learning. Collaboration in online learning involves students working together in virtual spaces in co-constructing and sharing knowledge (Kukard, 2020). The importance of collaborative learning is realised in how it promotes deep learning (Nooijer et al., 2021). As the students work together, they become deeply involved in learning and achieve higher-order learning outcomes. In an online environment, students form teams or groups and work online on instructional activities to achieve common educational goals (Nooijer et al., 2021). Collaborative learning online further promotes the development of soft skills such as communication, collaboration, problem-solving, and critical thinking skills (Le et al., 2018). It is, therefore, critical to realise that as students are involved in collaborative learning activities, the development of soft skills necessary for life-long learning is guaranteed.

Online learning platforms have discussion forums where students can have discussions in groups. Online discussion allows students to search for and interpret information before sharing it with others (Mtshali et al., 2020). Such an approach to learning is more student-centred and collaborative and is vital in making students take responsibility for their learning as they work with others. Therefore, participation in an online discussion enhances interactivity as the students can exchange information and ideas with others. The course instructor may post lead discussion questions, and the students respond to the questions and each other's responses. This way, the students engage each other and sharpen their critical thinking and communication skills.

The University of Eswatini, formerly the University of Swaziland, was established in 1972 as an amalgamation of the University of Botswana, Lesotho and Swaziland (UBLS), which were formerly known as the University of Basutoland, Bechuanaland and Swaziland (UBBS). In 1976, the University of Swaziland became a stand-alone entity. The University of Eswatini has grown to be the largest in Eswatini, with nearly eight thousand students in 2021. The University is a dual-mode institution, with the Institute of Distance Education offering academic programmes through distance learning.

The Institute of Distance Education (IDE) at the University of Eswatini was established in 1994. The current mandate of the Institute of Distance Education is to provide education and training opportunities to individuals who are unable to undertake conventional university academic programmes and courses. Over the years, the institute has used the print module as the primary way of delivering content to students, complemented with some face-to-face contact classes mainly during the weekends. In 2016, the University of Eswatini approved the blended learning policy, which provided some teaching to be conducted online through the Moodle LMS. The IDE has been the only institute to offer courses through the Moodle LMS since 2017. However, the offering has not been uniform, nor has adequate and systematic support been provided for staff and students to realise the meaningful implementation of online learning. The COVID-19 pandemic forced the University of Eswatini to offer online programmes, thus reviving the Blended Learning Policy. During this time, the IDE took leadership in offering training and support on Moodle usage to all staff and students at the university.

1.3 STATEMENT OF THE PROBLEM

The study was triggered by the quality and effectiveness concerns of online learning because of the urgent imperative to 'move online' caused by the COVID-19 pandemic (Houlden & Veletsianos, 2020). There is a need to focus on interaction as one of the quality standards for online learning. While online learning offers flexible and convenient ways of studying by transcending the limitations of place, space and time, Su and Waugh (2018) observe that online courses have higher attrition rates than conventional face-to-face classes. This is a cause for concern as high attrition rates are usually an indicator of inefficiency. Online learning should be associated with

success, which, according to Bates (2020), entails creating learning opportunities that fully engage all students to improve their academic outcomes. Similarly, Yu et al. (2020) note that the nature and quality of interaction in online learning predict learning persistence and academic achievement. Hence, the importance of focusing on the interaction experiences of distance education students in this study.

Despite a long-established blended learning policy, the transition to online learning at the University of Eswatini was a response to the COVID-19 pandemic. Course instructors and students needed to be adequately prepared for the transition. However, with many courses now offered online through the Moodle LMS (Mthethwa-Kunene & Maphosa, 2020), there is a need to establish the quality of online engagements from the students' perspective. The issue of students' interaction experiences in online learning is essential to investigate as a vital quality element.

The transition to online learning by many institutions of higher learning in response to the COVID-19 pandemic has resulted in concerns about the quality of learning, effectiveness, learning outcomes, and student satisfaction (Bao, 2020). The same applies to the University of Eswatini, where the rapid transition to online learning was a response to the pandemic. The rapid transition to online learning has raised concern over the effectiveness of the courses offered, initially developed for traditional classrooms. It is, therefore, essential to study how online teaching is conducted by establishing the quality of learning, the effectiveness of online learning, how students experience online learning and the extent to which they are satisfied. In instances where online courses are not designed, developed or facilitated well, student learning is negatively impacted (Stone & O'Shea, 2019). This engenders the need to establish students' interaction experiences in online learning and the implications for online pedagogy.

A concern that triggered the present study was how the Moodle online platform was utilised for online learning. This is against the realisation that an online learning platform should be used more than just as a learning content repository. The features of an online platform that allow collaborative learning should be fully utilised in pedagogically sound ways. As noted by Kukard (2020), there are concerns about how course instructors maintain collaboration and connection in online learning.

The study was further spurred by a desire to understand online learning from how the students experienced it as the intended beneficiaries. It seeks to empower students by establishing their voices, essential in understanding how they feel about online teaching and learning transactions and ascertaining what works for them (Keaton & Gilbert, 2020). The students' voices are often overlooked in the learning process, yet there are increased calls to democratise the learning environment by empowering the students. As universities migrate courses to be offered entirely online, there is a need to interrogate the implications of this migration for pedagogy by seeking ways of supporting and engaging the isolated student (Gillett-Swan, 2017).

How the students perceive online learning quality by reflecting on their experiences invariably reflects their motivation and persistence in online courses (Hassan et al., 2021). The present study sought to study the distance students' experiences of interaction in online learning to ascertain the meaningfulness of online learning experiences as an indicator of quality online teaching and learning transactions. It is observed that meaningful online teaching and learning differs from emergency remote teaching, where traditional contact courses are delivered online as a temporary measure of dealing with a challenge such as the COVID-19 pandemic (Bozkurt & Sharma, 2020). The quality of interaction is an indicator of carefully designed and implemented online courses.

The issue of transitioning from one mode of delivery to another often results in significant changes in the learning environment, which may cause anxiety to students (Stevanovi et al., 2021). Such anxiety may affect the way the students interact at different levels. In the context of the present study, it was essential to establish how the transition to online learning impacted the students in a rural-based university. The concept of rurality brings elements of disadvantage and unpreparedness in grappling with the requirements of a new online learning environment.

However, based on the above information, the main problem that triggered the undertaking of this study was to gain detailed and holistic insights into students' experiences of interaction in online learning and assess the implications for online pedagogy. Hence, the present study needs to establish how distance education students experience interaction in online learning at the rural-based university in Eswatini.

1.4. RESEARCH QUESTIONS

The study was guided by one main research question and six sub-research questions as follows;

1.4.1 Main research question

The study sought to answer the following main research question;

What are the distance education students' experiences of online interaction at a rural-based university in Eswatini?

1.4.2 Sub-research questions

The following sub-research questions were sought to be answered;

1.4.2.1 How do students understand interaction in online learning?

1.4.2.2 What benefits do students derive from interaction in online learning?

1.4.2.3 How are students trained and supported for interaction in online learning?

1.4.2.4 What factors promote or hinder interaction in online learning at the rural-based university?

1.4.2.5 What are the implications for online pedagogy at the rural-based university?

1.4.2.6 What model or framework can be designed for effective online pedagogy in developing contexts?

1.5 AIM OF THE STUDY

The study aimed to explore the distance education students' experiences of online interaction at a rural-based university in Eswatini.

1.5.1 Research objectives

From the aim, the study sought to address the following research objectives.

1.5.1.1 To ascertain students' understanding of interaction in online learning.

1.5.1.2 To establish the benefits students derive from interaction in online learning.

1.5.1.3 To find out how students are trained and supported for interaction in online learning.

1.5.1.4 To identify factors that promote or hinder interaction in online learning at the rural-based university.

1.5.1.5 To assess the implications for online pedagogy at the rural-based university.

1.5.1.6 To propose a model/framework for effective online pedagogy in developing contexts.

The following section discusses the research methodology in terms of the study's research design and methods.

1.6 RESEARCH PLAN OF ACTION

Table 1.1 summarises the research pathway, serving as a strategic guide for the study.

Table 1.1: Research plan of action

Guiding Research Question	
What are the distance education students' experiences of online interaction at a rural-based university in Eswatini?	
Sub-Research Questions	
<ul style="list-style-type: none"> - How do students understand interaction in online learning? - What benefits do students derive from interaction in online learning? - How are students trained and supported for interaction in online learning? - What factors promote or hinder interaction in online learning at the rural-based university? - What are the implications for online pedagogy at the rural-based university? - What model or framework can be designed for effective online pedagogy in developing contexts? 	
Paradigmatic Suppositions	
Epistemological Model	Post-Positivist
Methodological Model	Mixed-Methods
Theoretical Framework – Connectivism/ Community of Inquiry Framework	
Research Strategy – Concurrent Triangulation Design	
Selection of Respondents (Quantitative aspect) - Stratified Random Sampling	

Population size – 1815 students	Sample size – 361 students (20%)
Selection of Participants (Qualitative aspect) – Purposive Sampling	
40 participants (in four focus groups)	Selection criteria: At least two years of experience in online learning High level of participation in online courses
Data Collection	
Quantitative data	Structured questionnaire
Qualitative	Focus group discussions
Analysis and Interpretation of Data	
Quantitative data analysis	Use of SPSS software Descriptive statistics
Qualitative data analysis	Thematic content analysis
Merging of quantitative and qualitative data	At the data interpretation stage
Quality assurance measures	
Validity and Reliability – for the quantitative aspect	
Measures to enhance the validity	Expert opinion, pilot-testing
Measures to enhance reliability	Cronbach alpha calculation
Data trustworthiness – for the qualitative aspect	
Measures to enhance credibility	
Measures to enhance transferability	
Measures to enhance dependability	
Measures to enhance confirmability	
Ethical Considerations	
Ethical Considerations adhered to	Ethical clearance, permission to conduct research, informed consent, confidentiality and anonymity.
Conclusions	
Recommendations	

As shown in Table 1.1, the plan of action shows a clear direction followed in this mixed-methods study.

1.7 LITERATURE REVIEW

The review of literature germane to the study was carried out to understand the debates around interaction in online learning and build a base upon which the present study is built. It further centres on the concept of interaction in online learning, the benefits of interaction in online learning, student training and support for interaction in online learning, and the factors promoting or hindering interaction in online learning. A detailed review of the literature is provided in the third chapter.

1.8 THEORETICAL FRAMEWORK

The connectivist theory and the Community of Inquiry Framework underpinned the study. The connective learning theory by Siemens (2005) and Siemens and Downes (2009) is a contemporary theory that seeks to provide an understanding of online learning. The theory assists in understanding learning with technology and within organisations (Bell, 2011). The Community of Inquiry framework also framed the study as it sought to engage in the understanding of a learning community through the cognitive and emotional connections of the distance students as they learn together (Kozan & Caskurlu, 2018). The Community of Inquiry framework is premised on the importance of three presences: the cognitive, social and teaching presences, which serve as hallmarks for building and strengthening learning communities (Garrison et al., 2001). These three presences are interdependent in creating an enhanced and meaningful educational experience (Garrison et al., 2001). The second chapter of this study provides a detailed discussion of the theories and how they informed the study.

1.9 RESEARCH METHODOLOGY

This section explains and justifies the research paradigm, research approach, research design, population, sample and sampling techniques, data collection instruments, validity and reliability, trustworthiness, data collection, data analysis, and ethical issues.

1.9.1 Research paradigm

A research paradigm is a research philosophy that informs the researcher's views about research and the research process (Linake et al., 2022). The study was located in the post-positivist research paradigm. In discussing the post-positivist research paradigm, the researcher focuses on the paradigm's ontological, epistemological and methodological position. According to Letourneau and Allen (2006), post-positivists posit that maintaining the certainty that absolute truth is discoverable through science is untenable today. Post-positivism emphasises methodological pluralism, which balances positivist and interpretivist approaches (Panhwar et al., 2017). The post-positivist research paradigm does not seek to discredit positivism but looks at reality as multifaceted (Kock et al., 2008). Hence, there is a need for a multi-dimensional and multi-methodological thrust in explaining reality. The issue of experiences of

interaction in online learning by distance education students shall be considered contextual and multidimensional. This explains the location of the proposed study in the post-positivist research paradigm.

Epistemologically, post-positivism notes that truth can be pursued in research, but it is difficult to arrive at truth owing to the complicated nature of reality (McMurtry, 2020). Furthermore, truth is bound by context, human action and interaction (Tanlaka et al., 2019). The preceding assertion departs from the positivist viewpoint that knowledge is objective and can be tested and verified scientifically. The study accedes to the elusive nature of knowledge and seeks to employ multiple methods to investigate and arrive at conclusions.

1.9.2 Research approach

The study followed a mixed-methods research approach. A mixed-methods research approach is an emergent methodology of research that advocates the systematic integration or combination of quantitative and qualitative data within a single study (Creswell & Plano Clark, 2017). Mixed methods research entails collecting, analysing, and interpreting quantitative and qualitative data in a single study or a series of studies to investigate the same research problem (Johnson et al., 2007). A mixed methods research approach utilises a variety of approaches, data sources, data collection methods, and strategies for analysis, which are integrated to achieve the purposes of inquiry (Bazeley, 2018). The main thrust of the approach is that combining quantitative and qualitative approaches in one study provides a better understanding of a research problem than the use of either of the approaches (Creswell & Plano Clark, 2017). The study sought to understand students' experiences of interaction in online learning holistically. This was done by collecting quantitative and qualitative data at the same time.

1.9.3 Research design

Regarding the research design, the study followed a concurrent triangulation strategy design. In line with the mixed-method research approach, a concurrent triangulation strategy involves simultaneously collecting quantitative and qualitative data. Figure 1.1 illustrates the concurrent triangulation process.

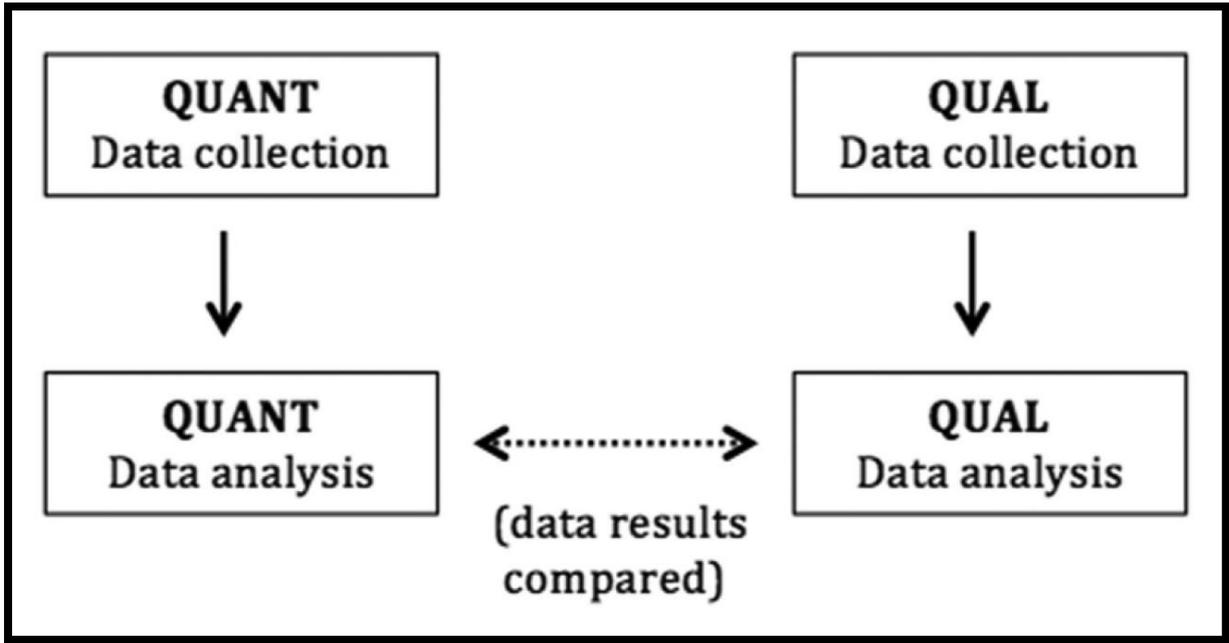


Figure 1.1: Illustration of the concurrent triangulation design

Quantitative and qualitative data are collected separately at the same time. The analysis is done separately using different data analysis techniques, and data are integrated at the interpretation stage (Creswell & Plano Clark, 2017). The results from the two data sets are then combined and compared to answer a specific research question. In the context of this study, the researcher sought qualitative data to explain some of the quantitative responses, thus providing a complete picture of the issue under investigation.

1.9.4 Population and sampling

The total number of students in the Institute of Distance Education at the time of conducting the study was 1815. For the quantitative aspect of the study, a stratified random sample was utilised to select a 20% sample size of 361 students. The strata considered in the sampling included the level of study, gender and programme. From a total of twelve academic programmes in the Institute with different numbers of students, the programmes, levels of study and gender constituted the strata. The researcher used alphabetical lists for all enrolled students per programme of study, level of study and gender, which were obtained from programme coordinators. Using the random number table, simple random sampling was employed within each programme list to determine the required number of students per programme, level

and gender. This method ensured the representation of all programmes, genders, and all levels of study. The details of the sampling procedure are contained in section 4.5.1 of the fourth chapter.

The participants' selection utilised the purposive sampling technique for the study's qualitative aspect. Purposive sampling is explained by Ames et al. (2019) as one that selects key informants with rich experiences such that they will provide in-depth insights on issues under investigation. A purposive sample of forty (40) students, 10 in each level of study, constituted the four focus groups. Details of the sampling and inclusion criteria are discussed in Section 4.5.2 of the fourth chapter.

1.9.5 Data collection instruments

The study employed a structured questionnaire and focus group discussions. The questionnaire in this study was a research instrument consisting of a set of standardised Likert scale-type questions to gather statistically valid information about a subject from respondents (Roopa & Rani, 2012). There are numerous benefits of using a questionnaire, such as its ability to generate large amounts of data and the fact that it is inexpensive and often uses easy-to-understand and easy-to-respond items whose responses are easy to quantify and analyse (Roopa & Rani, 2012).

Focus group discussions were employed to collect qualitative data. Ochieng et al. (2018) observed that a focus group discussion brings together participants from similar backgrounds to discuss an issue from their knowledge and experience. In this study, ten students with more than two years of experience in online learning constituted one focus group. They were brought together to discuss their experiences of interaction in online learning. The researcher considered a focus group discussion appropriate for collecting qualitative data because the participants were allowed to reflect on their online learning experiences, with particular emphasis on interaction. Guided by a set of questions constituting a focus group discussion schedule, the participants provided verbal responses to different questions from the researcher. Different viewpoints were solicited on individual interview questions. Four interview sessions with four groups were conducted online through the Zoom web conferencing platform.

1.9.6 Data collection process

The questionnaire was administered online through Google Forms. The questionnaire link was sent to the respondents who responded anonymously online. Modern-day technologies provide options for traditional face-to-face interviews (Krouwel et al., 2019). In line with the COVID-19 protocols, focus group discussions were carried out through the video-calling facility.

1.9.7 Data analysis

Quantitative data were analysed statistically using the Statistical Package of Social Sciences (SPSS) version 29. As Kaliyadan and Kulkarni (2019, p. 83) observed, descriptive statistics entails using tools such as frequency distribution tables, percentages, and other measures of central tendency, such as the mean and standard deviation. In the study, the collected numerical data were analysed by interpreting mean response scores to ascertain the respondents' level of agreement with the different question items on interaction in online learning. As further noted by Kaliyadan and Kulkarni (2019), descriptive statistics is also utilised to describe a single variable (univariate analysis) or more than one variable (bivariate/ multivariate analysis).

Qualitative data were analysed using the thematic content analysis technique. Thematic analysis, as noted by Kiger and Varpio (2020), involves analysing qualitative data by systematic search across a data set to identify themes and sub-themes emanating from repeated patterns. The details of the thematic content analysis technique and how it was utilised are provided in section 4.8.2 of the fourth chapter.

1.10 VALIDITY AND RELIABILITY

This section considers the proposed mixed-methods study's validity, reliability and data trustworthiness issues. In line with the quantitative aspect of the mixed-methods study, issues of validity and reliability were considered.

1.10.1 Validity: Validity refers to the technical soundness of a study (Creswell, 2014). To ensure construct and content validity, the questionnaire was given to an expert in online learning for validation. To ensure internal and external validity, the questionnaire was pilot-tested.

1.10.2 Reliability: Reliability is the degree to which research can be repeated while obtaining consistent results (Quinlan, 2011). The Cronbach alpha coefficient values were calculated to ascertain reliability of the structured questionnaire.

1.11 DATA TRUSTWORTHINESS

In enhancing the quality of qualitative data to be collected, the research addressed the four constructs by Guba (1981): credibility, transferability, dependability and confirmability. The following measures shall be taken:

1.11.1 Credibility - According to Lincoln and Guba (1985), credibility in qualitative research is about a study's internal validity or truth value. To ensure credibility in the study, the researcher triangulated findings. Data were collected through Focus Group Discussions. Member checking was also employed, as the FGD participants were allowed to check the discussion transcripts for accuracy.

1.11.2 Transferability - Transferability is about the degree to which qualitative results can be transferred to other contexts or settings or simply applicability (Lincoln & Guba (1985) cited in Korstjens and Moser (2018)). The researcher used thick descriptions in presenting the results of the present study in ways that make them applicable to similar contexts.

1.11.3 Dependability - According to Lincoln and Guba (1985), cited in Korstjens and Moser (2018), the dependability of results in a qualitative study is the consistency of results over time. The measures to ensure dependability include a detailed description of the research methodology, context, and participants. Member checking was also utilised as participants were allowed to check the authenticity of data provided through FGDs. Expert opinion was sought on the data collection instrument. The FGD schedule was given to an expert in online learning to interrogate it before it was fine-tuned for final use.

1.11.4 Confirmability - Lincoln and Guba (1985) note that conformability is the degree to which other researchers can establish the findings of a qualitative study. Confirmability was ensured by maintaining an audit trail of the data collection process and clearly describing the research process. Frequent debriefing sessions were also

utilised as the FGD participants were allowed to reflect on their responses as the data collection progressed, and this assured the collection of rich and accurate responses.

1.12 ETHICAL ISSUES

The researcher addressed the following ethical issues in the study:

1.12.1 Research permission – The researcher obtained ethical clearance from UNISA before collecting data. Explicit permission to conduct the study was also sought and obtained from UNISA and the University of Eswatini.

1.12.2 Informed consent – The researcher designed an informed consent form for the respondents. Respondents and participants were requested to sign to agree to participate in the study with no conditions tied to their participation.

1.12.3 Anonymity and confidentiality - The researcher also undertook to protect the identity of the respondents to the questionnaire. Respondents and participants were requested to respond anonymously, and their responses were treated in the strictest confidence.

1.12.4 Voluntary participation and withdrawal - Respondents and participants participated in the study freely and without coercion. Furthermore, they were free to withdraw from the study at any stage and for whatever reason. The more comprehensive details on ethical issues are discussed in Section 4.10 of the fourth chapter.

1.13 DEFINITION OF KEY CONCEPTS

In this section, the researcher defines the pertinent terms used in the study. The operational definitions are given according to how the terms will be used in the study.

1.13.1 Online learning: This is defined as learning organised and delivered through web-based or internet-based technologies (Singh & Thurman, 2019, p. 293). In online learning, students are separated geographically from the course instructor, and technology is utilised to mediate communication and learning. A Learning Management System (LMS) is utilised as the learning platform, and learning could be synchronous or asynchronous. Students' access to the appropriate technological devices and internet connectivity is vital in online learning. In the context of the

proposed study, online learning refers to learning planned, organised and delivered through an LMS.

1.13.2 Interaction: Interaction is associated with cooperation, collaboration and active learning (Kenny, 2002, as cited in Van den Berg, 2020). As further noted by Yanchenko (2019), interaction hinges on communities and networks, bringing to the fore the importance of students working together online. Interaction happens at different levels and for different purposes; hence, it should be understood holistically. In the present study, interaction shall refer to how students engage with fellow students, course instructors, course content, and technology in a virtual learning environment.

1.13.3 Learning community: A learning community is a group of students who work together and support each other for a common goal (West & Williams, 2017). In a learning community, the students can engage, interact, make sense of content, and create and share content through the virtual learning platform (Saadatmand et al., 2017). Through participation in an online learning community, the student learning online develops a sense of belonging with support from fellow students. This study's learning community refers to small and large student groups working online.

1.13.4 Collaborative learning: Collaborative learning is defined by Bergamin et al. (2019) as a type of learning where two or more students learn together. Collaborative learning is student-centred and allows students to be involved in group and team-based learning activities, which utilise discussion and active learning techniques (Scager et al., 2016). Through collaborative learning, there is student-led discovery and learning. In collaborative learning, students exploit the richness of their diverse experiences, backgrounds, and perspectives to enhance their learning experiences (McCollum et al., 2019). In this study, collaborative learning refers to how a group of students purposefully works together in a virtual learning environment to enrich the learning experiences mutually.

1.13.5 Distance education: Distance education entails learning taking place where there is a separation between the student and the course instructor (Keegan (1988), cited in Saykılı (2018, p. 3). The history of distance education is traced in terms of technology from the earlier postal days to the modern-day fully online approaches over

the internet. Technology is pivotal in mediating learning in the modern-day distance education systems. As noted by Aoki (2012), distance no longer matters in distance education because technology enables students to access content and engage in learning quickly. Learning has become flexible, convenient and cost-effective for the students. Using technology, the separated students and course instructors are connected virtually.

1.14 CHAPTER DIVISION

The study is made up of seven chapters, as explained below.

1.14.1 Chapter 1 - Orientation and Overview

This is the introductory chapter, which provides a detailed background to the study, a statement of the problem, main and sub-research questions, and the aim and objectives of the study. The theories underpinning the study are introduced. A brief methodology of the study is also explained in this chapter. The chapter defines the pertinent terms used in the study and provides the chapter division.

1.14.2 Chapter 2 - Theoretical Framework

In this chapter, the researcher undertakes an extensive and intensive discussion of the theories informing the study. The connectivist learning theory and its central tenets are discussed and linked to the study. In this chapter, the researcher shows how the connectivist learning theory 'frames' the present study. The chapter also discusses the Community of Inquiry framework by focusing on the interplay of the three 'presences': teaching, cognitive and social. The way the theory underpins the study is discussed.

1.14.3 Chapter 3 - Literature Review

In this chapter, the researcher undertakes a critical and extensive review of literature germane to the study by consulting current and varied sources aligned with the research objectives. The concept of interaction in online learning is discussed in detail, and the benefits of interaction in online learning are discussed. In the chapter, the researcher also reviews the literature on student support for interaction in online learning and the factors promoting or hindering interaction in online learning. The study reviews existing policies and frameworks in the Eswatini education system and its implications on online learning.

1.14.4 Chapter 4 - Research Methodology

The chapter on research methodology discusses and justifies all the critical methodological processes and the study procedures. This starts by looking at the research paradigm, followed by the research approach, research design, population and sampling, data collection tools, validity, reliability and data trustworthiness, data analysis and ethical issues.

1.14.5 Chapter 5 - Data Presentation and Analysis

This chapter presents, analyses and interprets the data. Quantitative data is presented through descriptive statistics in mean, median, mode and standard deviation. Qualitative data shall be presented in themes and sub-themes and supported by verbatim participant quotations. The quantitative and qualitative data sets are merged at the interpretation stage in line with the concurrent triangulation design.

1.14.6 Chapter 6 – Discussion of findings

In this chapter, the researcher discusses the results of the study. The discussion of findings is carried out against findings in the literature reviewed. The purpose is to establish if the study's findings confirm what is in the literature. Furthermore, the discussion of findings is carried out in the light of the theories underpinning the study. The veracity of the findings is ascertained using the theoretical lens,

1.14.7 Chapter 7 – Summary, Conclusions and Recommendations

This is the closing chapter summarises the study and provides conclusions and recommendations, emphasising contribution to the body of knowledge in terms of policy and practice.

1.15 CONCLUSION

The researcher introduced the study and provided an overview in this chapter. The study was put into context by providing a comprehensive background. The general background of online learning and interaction was covered, which led to the discussion of the Eswatini setting in which the study was conducted. The problem was stated after the background of the study was discussed. The researcher provided the main research questions, sub-research questions, the study's purpose, and research objectives. The researcher explained the brief methodology of the study by addressing

the research methodology, research methods and ethical considerations. The researcher also explained the fundamental concepts of the study. In the next chapter, the researcher discusses the theoretical underpinnings of the study by discussing the Connectivism learning theory and Community of Inquiry framework and how they informed the present study.

CHAPTER TWO

THEORETICAL FRAMEWORK

2.1 INTRODUCTION

The previous chapter placed the study in context by providing the background to the study and highlighting the statement of the problem, research questions and objectives, among other introductory aspects of the study. In this chapter, the researcher deals with the theoretical underpinnings of the study by explaining what the theoretical framework entails and its importance in carrying out the research study. The connectivist theory and the Community of Inquiry Framework as theoretical underpinnings for the study are discussed in detail, showing how they both serve as underpinnings of the present study.

Figure 2.1 summarises the conceptual understanding of the theoretical framework in this section.

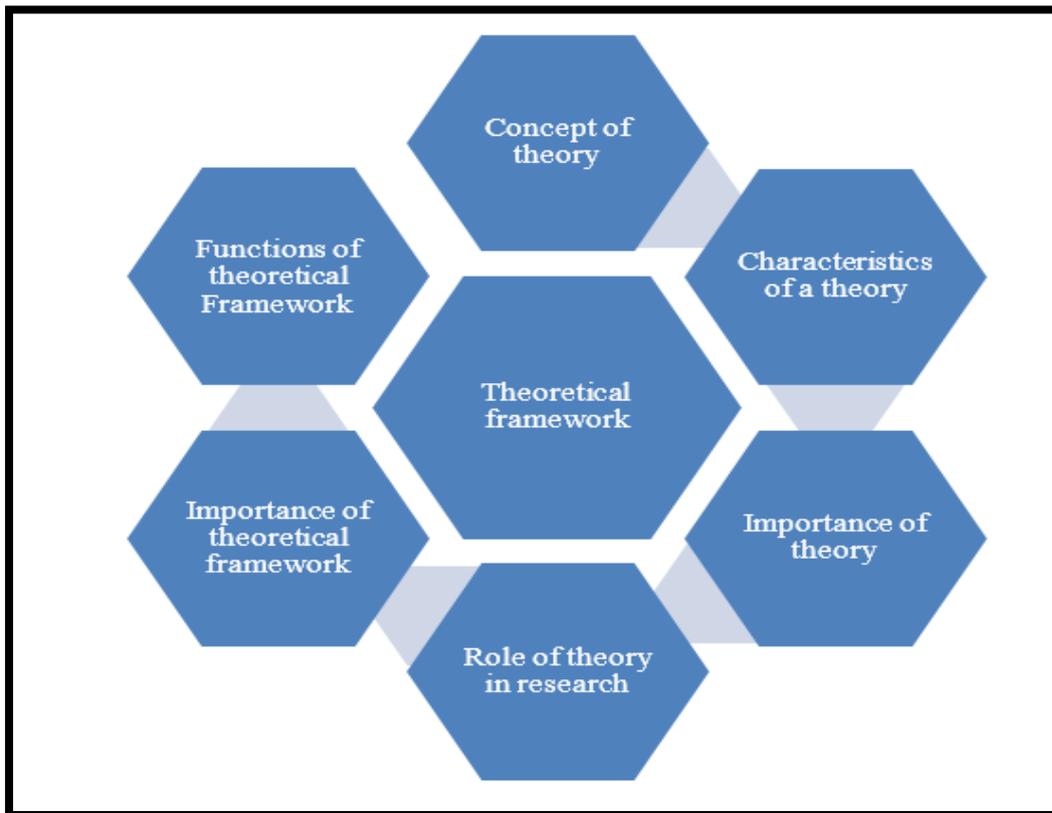


Figure 2.1: Understanding theoretical framework (Source: Researcher's own)

As shown in Figure 2.1, in this section, the researcher explores the concept of theory and explains its characteristics. Furthermore, the section discusses the importance of theory and its role in research before dwelling on the importance of a theoretical framework in framing a study. The following section unpacks the concept of theory.

2.2 THE CONCEPT OF THEORY

According to Rengasamy (2016, p. 120), theory "is an overview about a phenomenon that explains how or why the phenomenon occurs." In the context of the present study, a theory would provide a clear explanation of interactions in online learning, thereby clarifying the nature and extent of the interaction phenomenon in online learning. On the same note as how the theory explains phenomena, Sha (2018) observes that a theory is an idea or an explanation of how things work. The interaction concept would require a theoretical explanation of what it is and how it happens in a virtual learning environment. Furthermore, Babbie (2014, p. 9) defines theory as "a systematic explanation for the observations that relate to a particular aspect of life."

A theory should withstand the test of time; hence, it should be tried and tested and continue to provide a clear explanation of the phenomenon on which it is centred (Rengasamy, 2016). A theory should also be able to produce credible results when tested in different circumstances. The connectivist theory, for example, was propounded by Siemens in 2005 but remains critical in providing a valuable understanding of technology-driven and technology-informed teaching and learning. Although classical theories such as cognitivism and behaviourism might help provide teaching and learning in general, there is a need for a theory that looks at teaching and learning in a fast-changing technological world.

Bryman and Bell (2011) further note that theory documents observed realities or observations around people and is accepted by the people. The existence of the observed realities espoused in theory becomes a valuable lens for understanding a particular phenomenon. The way students should work together to maximise interaction is explained well in the Community of Inquiry (Col) framework, and this clearly shows how theory assists in making sense of reality. As the students work together, critical issues espoused by the Col framework are crucial to understanding interaction in a broader and holistic sense. To this end, the virtual classroom is a

synchronous online learning environment that seeks to deliver course materials to the students and affords live, contextual and interactive learning environments for students (Mpungose, 2020).

A theory is "a set of interrelated constructs (concepts), definitions, and propositions that present a systematic view of phenomena by specifying relations among variables to explain and predict the phenomena." (Kerlinger & Lee, 2000, p. 11). The connectivist learning theory by Siemens (2005) systematically explains learning with technology so that one understands the role of the student, the course instructor and technology in ensuring meaningful online learning interaction and deeper learning. The fundamental tenets of the theory assist in clarifying aspects of learning with technology, such as the importance of teaching students to be adaptable as they learn using constantly changing technology (Siemens & Downes, 2009, as cited in Mpungose & Khoza, 2020).

2.2.1 Characteristics of a theory

One of the characteristics of a theory is that the concepts and principles contained in it should be able to explain what is going on and why (Kivunja, 2018). In the theories chosen for this study, attempts are made to present variables on interaction and how they explain how interaction promotes meaningful learning in an online learning environment. It becomes essential to fully theorise interaction to understand interaction issues from different angles.

Another characteristic of a theory is that it must be logical and coherent (Kivunja, 2018). The theories selected as underpinnings for the present study are logical and coherent in explaining the issue of interaction in learning. The connectivist theory explicitly constructs what teaching in a technological environment would entail, giving primacy to forming connections with technology and virtual learning peers. Students learn better in virtual spaces by interacting with the technology and with fellow students. Similarly, the Col framework is logical and coherent by underscoring the importance of developing and sustaining the three 'presences', namely social, teaching and cognitive presence in online learning.

2.2.2 Importance of theory

In emphasising the importance of theory, Verbeeck (2016, p. 383) cites the famous statement by Kurt Lewin that "there is nothing more practical than a good theory." The preceding statement means that a theory helps practically clarify issues. A theory contains well-defined concepts (Verbeeck, 2016). Such concepts are usually symbolic representations of the actual issues. Numerous concepts are loaded in the interaction phenomenon in online learning, hence the importance of theorising the phenomenon. In theory, there are also principles, which are relationships between concepts. The concepts and principles assist the readers in understanding the phenomenon clearly and predicting future events through causal or correlational relationships. Any theory on interaction, therefore, provides a clearer understanding of the issue as it relates to learning online.

A theory is also essential as it provides concepts to name what is observed and explains the relationships between concepts (Johnston, 2014; Rengasamy, 2016). The way theory enables the researcher to name and explain concepts of a phenomenon, and the relationship between concepts allows the complete understanding of an issue before one undertakes research. In instances where students learn online, there is a need to understand this type of learning as different from face-to-face contact learning, hence the need to examine the issue through theories to understand interaction in virtual learning spaces.

A theory provides more precision, ruling out ambiguity (Johnston, 2014). It would be folly for a researcher to undertake a research study without a clear understanding of the issue or issues to be investigated. The issue under investigation in the present study is that of online learning experiences, and one should have a clear grasp of the concepts in online interaction and how they relate. The issue of interaction is considered an essential pedagogical aspect, especially in online learning, where students are separated physically from the course instructors. Several concepts should be understood regarding interaction in online learning, such as how students interact with course content, course instructors and fellow students (Kumar et al., 2021).

A theory is a means to assist in problem identification (Kumar et al., 2021). A research problem triggers any worthwhile research endeavour, and the research process unfolds to solve the problem. A theory helps to delve deeper into the research problem by identifying areas of inadequacy that the study may seek to address. The interaction issue in online learning pursued in the present study is multifaceted, as quality interaction in online learning requires problematisation through theory to establish problem areas that require systematic investigation. The role of theory in research is discussed in the next section.

2.2.3 The role of theory in research

In the social sciences, a theory explains why people act or do as they do (Biesta et al., 2011, p. 227). Similarly, Rasmussen (2017) notes that theory assists people in understanding how other people see and experience the world and, invariably, develops their understanding of how the world works. Theory in research enables the researcher and the research audience to illuminate and clarify issues. The present study centres on interaction in online learning, and there are different viewpoints on what interaction entails. They should be in a virtual learning environment, hence the importance of theorising such issues to understand them better.

A theory's role in research may be to predict and control action by applying the 'if-then' logic. This means that theory provides a logical explanation of a phenomenon to make control and prediction of events or actions possible (Saldana & Omasta, 2018). In the context of the present study, if theory clarifies the types of interaction, it becomes easy to judge if an online learning environment is meaningfully interactive. This is possible by establishing if online learning attaches to the types of interaction and the nature and extent of student involvement.

A theory also helps to account for variations within the issue under investigation (Anfara & Mertz, 2015). The complexity of a phenomenon in social science research may call for the need to have a holistic understanding of any issue by considering all the possibilities. Using existing tried and tested theories would provide a complete comprehension of an issue by considering its overt and covert features. For example, the interaction issue in online learning is multifaceted and would require theories to account for the variations and complexities to clarify and illuminate the complex issue.

The theory explains how and why something happens through causation. In explaining and clarifying phenomena, causation issues may be accounted for by a theory (Saldana & Omasta, 2018). On the phenomenon of interaction in online learning, theories will explain what promotes or negates meaningful interaction of online students in learning. Explaining such issues allows the researcher to be wary of critical issues around the phenomenon under study as it illuminates the researcher's understanding of how the issue can be investigated.

Understanding the concept of theory leads to a discussion of a theoretical framework. The following section discusses the theoretical framework and its role in a research study.

2.3 UNPACKING THE THEORETICAL FRAMEWORK

A theoretical framework is the blueprint upon which the entire research study rests. It can be regarded as the foundation upon which a study is built (Grant & Osanloo, 2014). A formal theory is a pivotal structure to guide how the researcher will 'philosophically, epistemologically, methodologically, and analytically approach the dissertation as a whole.' (Grant & Osanloo, 2014, p. 13). As a vital structure, a theoretical framework informs how the study will be carried out, depending on the study's philosophical perspective. The preceding observation ties nicely with Mertens's (1998, p. 3) assertion that the theoretical framework "has implications for every decision made in the research process."

A theoretical framework connects existing knowledge and previously formed ideas about complex phenomena (Collins & Stockton, 2018). The preceding assertion alludes to the point that issues worth investigating are often complex and require explanation and clarification from different and particular theoretical standpoints. It is often difficult to establish the variables in a research problem if the complex issue under investigation is clarified correctly, hence the importance of theorising issues.

2.3.1 Importance of a theoretical framework in research

A research study centres on an identified problem, and a theoretical framework informs the identified problem (Heale & Noble, 2019). It should delineate the research problem and how to investigate it. A theoretical framework also assists in defining the

parameters of the research problem. The present study sought to problematise the issue of interaction in virtual learning environments, which was made possible by looking at the issue from the relevant theories. Such theorising made it possible to consider students' interaction with subject content, course instructors, fellow students and technology.

A theoretical framework assists with demonstrating how one's research fits with what is already known by establishing the relationship between theory and research (Kuada, 2012). The interaction issue in online learning may be considered in general terms, but considering it through relevant theories helps link the general issues about the phenomenon to what has already been researched. This further assists in identifying what has been studied and what still requires to be studied, placing the proposed study in an appropriate context.

The linking of theory and research is vital in carrying out a literature review germane to the study (Creswell & Creswell, 2018). Issues are theorised in such a review, and the researcher can identify gaps in the literature. Any meaningful research study should include more than just replicating what has already been done but should advance the frontiers of knowledge by improving theory and practice. Using relevant theories to understand research phenomena contributes to identifying gaps that become focal areas of a research study in contributing to new knowledge.

A theoretical framework demonstrates the relationship of concepts of a complex issue to be investigated (Heale & Noble, 2019). The key concepts are identified, and the relationship between the concepts is explained. This will assist in refining the areas the study will focus on by shaping the research questions and hypotheses. Identifying a study's variables may be challenging if no theoretical lenses are applied in clarifying and explaining the issue under investigation. Regarding interaction in online learning, theories provide a clear explanation of the concept interaction and the related concepts, as well as the relationship between the concepts. This assists the researcher in gaining a clearer understanding of the concept before undertaking research.

A theoretical framework further assists in explaining the interaction of concepts in a theory and providing indicators of essential issues to consider in an investigation

(Heale & Noble, 2019). When one considers the interaction phenomenon in online learning, a theoretical framework would identify critical concepts and how they interact to provide a complete understanding. A theoretical framework becomes significant in establishing critical concepts of the issue under investigation and how they work together. A study not underpinned by theory may miss out on critical issues or concepts surrounding a phenomenon and how such issues are linked.

2.3.2 Functions of a theoretical framework in research

Any formal research should not be conducted in a vacuum. A theoretical framework assists in connecting the researcher to existing knowledge through established, tried and tested theories. Using relevant theories as theoretical underpinnings for a study, the researcher can "connect the issues they are investigating to the existing body of knowledge in the area" (Kuada, 2012, p. 64). The connection of one's study to the existing body of knowledge assists in broadening and deepening the understanding of issues under investigation.

The key variables influencing a phenomenon of interest are identified through a theoretical framework (Creswell & Creswell, 2018). Once the variables are specified, it becomes easy for the researcher to draft the research hypotheses or questions that guide the investigation. In the present study, which focuses on the phenomenon of interaction in online learning, theories such as the Community of Inquiry framework identify three 'presences' as critical features of interaction, and this guided the researcher to focus on 'experiences' to ascertain the distance education students' familiarity with interaction as they get involved in online learning.

According to Menken and Keestra (2016), a theoretical framework is crucial for research because it helps the researcher know the significance of the study's key variables, how they could differ, and under what conditions. The interaction issue in online learning may be positively or negatively affected by how the students interact with technology. Technology becomes an essential variable in interaction in online learning; hence, the researcher needs to understand the technologies utilised (availability and affordability) and the training and support offered to the students and course instructors.

A theoretical framework as a research blueprint allows the researcher to express the theoretical suppositions of a research study and, in the process, answer the question of why and how about a phenomenon (Lytje et al., 2015). In the expression of theoretical assumptions, abstract issues are concretised and clarified. In expressing the assumption of interaction in online learning, the connectivist theory highlights interaction in four areas. The students interact with course instructors, fellow students, course content and technology. In all this, the students learn by making connections with an observation that through interaction with technology, learning resides in non-human appliances (Siemens & Downes, 2009).

It is also important to note that a theoretical framework in research serves as a structure and support for the rationale of the research problem (Rudasill et al., 2017). A study is carried out on the premise of a worthwhile research problem or statement of the problem. Therefore, by theorising issues, the problem statement is clarified and strengthened. In the present study on online interaction experiences, the chosen theories, such as the connectivist theory, assist in broadening the understanding of what constitutes effective interaction in online learning.

As Rudasill et al. (2017) noted, a theoretical framework is essential for helping the researcher create the appropriate research hypotheses or questions. Research questions, for example, are the questions the study seeks answers for by collecting data from the identifiable unit(s) of analysis. In the present study, the research questions, as informed by the relevant theories, centre around students' understanding of interaction in online learning, benefits derived by students from interaction in online learning, training and support offered to students for interaction in online learning, factors promoting or hindering interaction in online learning as well as the implications for online pedagogy, with a view of suggesting a model or framework could be designed for effective online pedagogy in developing contexts.

A theoretical framework also assists the researcher in determining and justifying the research methods of a study (Walliman, 2018). To this end, theories inform the researcher's methodological processes and procedure choices. There are different research paradigms, approaches and designs that a researcher can utilise in a study, and the choice depends on epistemological assumptions guiding the study as informed by theories. The present study falls in the post-positivist research paradigm

because ontologically, post-positivism considers the subjectivity of reality and departs from the purely objective position of the logical positivists (Waismann, 2011).

2.4 THEORIES UNDERPINNING THE PRESENT STUDY

This section is devoted to an in-depth discussion of the theories underpinning the present study. The connectivist learning theory and the CoI framework inform the study. The two were carefully selected as they related to online learning, with the tenets of the theories providing pointers to interaction issues in online learning. Figure 3.2 provides a summary of the issues discussed in this section.

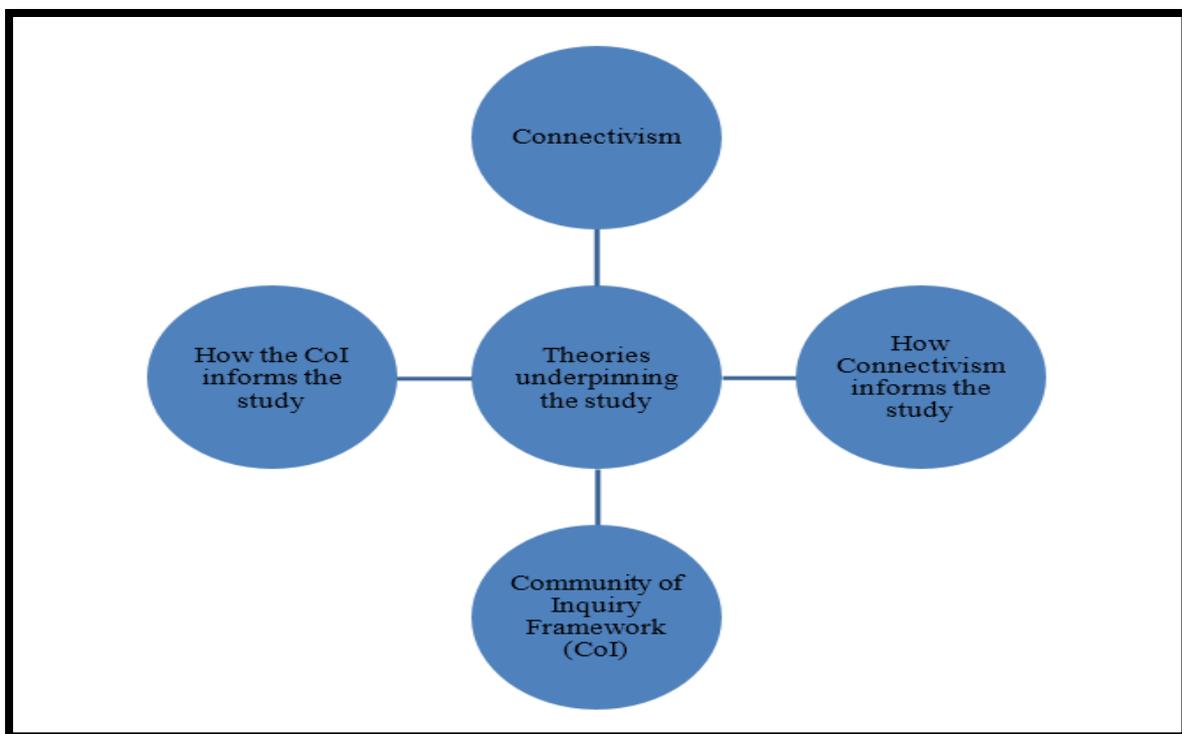


Figure 2.2: Theoretical underpinnings for the study (Source: Researcher’s own)

As shown in Figure 2.2, the study is underpinned by the connectivist learning theory and the CoI framework. The researcher discusses the two in detail in this section, showing how they frame the present study. In the next section, the connectivist learning theory is discussed.

2.5 THE CONNECTIVIST LEARNING THEORY

There is a need to trace the history of ODL in terms of pedagogies utilised to place connectivism in proper historical context.

2.5.1 Cognitivist-behavioural pedagogies

The first generation of ODL drew heavily on the cognitive-behaviourist pedagogy. The cognitivist-behavioural pedagogies draw from the classical behaviourist and cognitivist learning theories, which have dominated teaching and learning for a long time. In behaviourism, the purpose of learning is to change external behaviour. Behaviour is learned through interaction with the external environment (Anderson & Dron, 2011). To this end, methods such as drill, question and answer, and other rote-learning approaches, such as memorising facts, align with the behaviourist theory. Behaviourist principles in ODL are evident in teaching and learning approaches that are course lecturer-centred. Course materials, which include self-learning activities that require a low degree of processing, basic paired associations, discriminations and rote memorisation, draw from behaviourism (Anderson & Dron, 2011). Course lecturers must be aware that learning is more than basic stimulus-response associations. The purpose of learning is not merely to internalise and reproduce the content during assessment (Malatji, 2016). The cognitivist learning theory came as a reaction to behaviourism. Renowned cognitive theorists such as Piaget and Bruner are known for their contributions to pedagogy. The cognitive-behaviourist pedagogies in ODL are marked by the use of pre-packaged print material delivered to students as the primary source of content (Ma et al., 2012). Interaction between students and course lecturers, as well as among students, could have been more extensive. Students were made aware of the learning objectives, and all learning and student performances were meant to achieve the set objectives (Ma et al., 2012).

2.5.2 Social-constructivist pedagogies

The second generation of ODL is based on social-constructivist pedagogies. In this second generation, the social-constructivist theory informed ODL delivery (Anderson & Dron, 2011). Emphasis was on active instead of passive learning. Learning was more of a social activity, and available technologies assisted in bringing more students' social presence in learning. Learning was more student-centred, with the inclusion of social discussion and application of knowledge to genuine contexts (Anderson & Dron, 2011).

2.5.3 Connectivist pedagogy

According to Anderson and Dron (2011), the third generation is informed by the connectivist pedagogy of distance education. In this third generation, students learn by building connections with others and participating in online communities of inquiry. The connectivist learning theory was propounded by Siemens (2005) as the learning theory of the digital age. The theory postulates that students learn by making connections (Anderson, 2016). Students learn by making connections with technologies, course instructors and fellow students. At the heart of connectivism, therefore, is interaction.

2.5.4 Principles of the connectivist learning theory

Furthermore, the connectivist learning theory revolves around eight principles, which show how students learn in the digital age, and these are discussed below. According to connectivism, learning and knowledge rest in diverse opinions (Siemens, 2005). As the students learn together in a networked environment, they learn by sharing knowledge. The discussion forums of the learning management systems allow students to learn from one another through discussion. Online discussion on the LMS allows social interaction, a prerequisite for quality online learning (Afify, 2019). Connectivism, therefore, supports the importance of sharing and respecting different opinions in the learning process. In virtual learning spaces, there is a need for the students to work together.

Furthermore, according to connectivism, knowledge is strewn across a system of networks or contacts, and therefore, learning consists of the ability to relate well in the networks and negotiate meaning (Siemens, 2005). In online learning, the student learns in a virtual learning community and is expected to relate virtually with fellow students in co-constructing and sharing knowledge. This is the issue of interaction in online learning, which is the present study's focus. As informed by connectivism, it is essential to understand how students form relationships online and utilise the relationships for enhanced learning.

As further noted by Siemens (2005), in connectivism, knowledge is viewed as a set of connections formed by actions and experience. Of importance in the preceding observation is the nature of actions the students engage in online and the experiences

derived as they connect with course instructors, fellow students and technology. The present study sought to establish the students' experiences of interaction in online learning, and the issue of the connections they make in interaction was given primacy.

Connectivism emphasises that students learn through technology and with technology in the digital age, which is an essential consideration in establishing how students interact with technology (Abik et al., 2012). As further noted by Van den Berg (2020), interaction in online learning environments is possible when students can utilise technology effectively. Online learning occurs ordinarily through an LMS, and students should be able to navigate the LMS to derive maximum benefits from online learning. Connectivism, therefore, provides the dimension of students' interaction with technology as one worth pursuing in establishing distance education students' online learning experiences in the present study.

Connectivism believes that learning in a highly networked and connected world aims to connect students to different information sources (Kimmons et al., 2020). In the digital age, students are connected to various sources of information through electronic mobile devices with internet connectivity. Therefore, learning should inculcate digital and information literacy in students that enables them to identify and use relevant information for educational purposes. Students should learn ways of effectively accessing information and ethically utilising information in productive ways.

The importance of networked thinking is highlighted in connectivism as a learning theory (Kimmons, 2018). Networked thinking thrives on making connections with people and information in the learning process. In networked thinking, the students utilise a LMS's available technologies or tools to learn together and support each other. Central to networked thinking is collaboration in learning, where students challenge each other by exchanging information. In the context of the present study, there is a need to establish how students work together to challenge individual and collective thinking in virtual spaces.

Connectivism states that learning involves the utilisation of dialoguing and discussion (Siemens, 2005). Since online learning utilises a selected digital learning platform or LMS, it is vital for course instructors to exploit the different features of the LMS to involve students in exchanging information and knowledge to enhance learning. The utilisation of synchronous and asynchronous discussion assists students in creating

new knowledge as they are provided with opportunities to share learning as they respond to discussion threads, question and comment on fellow students' responses and, in the process, build their understanding of concepts through shared meaning (Zuheir et al., 2017)

In connectivism, learning entails connecting students with information resources (Siemens, 2005). It is important to utilise technology to connect students with information resources they engage with as they learn. Of importance is to connect students with Open Educational Resources. Hylén (2005, p. 1) defines OER initiatives as "open courseware and content; open software tools (e.g., learning management systems); open material for e-learning capacity building of faculty staff; repositories of learning objects; and free educational courses." In the context of the present study, it would be necessary to find out how course instructors expose students to Open Educational Resources, how students access the OER and work collaboratively to utilise OER in online learning.

In the connectivist learning theory, learning allows students "to exploit the affordances of Web 2.0 and to facilitate personal choices, participation, collaboration, and creative production" (McLoughlin & Lee, 2011, p. 51). The Web 2.0 tools such as WhatsApp, blogs, Twitter and Facebook allow students to communicate on social media platforms and learn collaboratively through the enhanced exchange of information. Through Web 2.0 tools, students are consumers and producers of content in a socially networked technological environment. The students should be provided opportunities to utilise Web 2.0 tools for academic purposes collaboratively. In the context of the present study, it would be essential to explore how the different Web 2.0 tools are utilised for learning in promoting collaborative learning.

Connectivism, as a learning theory, promotes learning as it happens external to an individual and learning may happen through social media. As Ansari and Khan (2020) noted, social media allows students to access course content through their electronic devices and provides valuable opportunities for academic collaboration. Given that social media is often and always utilised for social interaction and exchange of social information, it would be essential to establish the various social media platforms available for students at the University of Eswatini and how students utilise the platform for learning.

Connectivism also gives pre-eminence to learning in and through online networks. Students are expected to develop online networks with like-minded colleagues, and such networks are developed and sustained online to advance the learning cause. An online network becomes a learning community, and the students use their connectedness to co-create and share knowledge. Schreurs et al. (2019, p. 1) noted that networked learning has a self-organising element in which available technologies are utilised "to promote connections between students and their peers, students and tutors and students and learning resources." Students may organise themselves into learning communities as they work with peers, course instructors and learning materials.

Connectivism emphasises using technology to improve online students' learning experiences by connecting students to information sources (Kimmons, 2018). Central to the preceding view is the importance of identifying information sources and making them available to students online directly or through links in different multimedia formats.

Connectivism also states that learning can happen outside of an individual through online networks (Siemens, 2005). Networked learning is learning in which information and communication technologies promote emergent connections between students, their fellow students, course instructors, and students and learning resources (Schreurs et al., 2019). The said connections may not be deliberately designed for but are self-organising. To this end, learning networks may be formal or informal, allowing students to exchange views and experiences in the learning process.

The connectivist learning theory also advances the view that learning and knowledge rest on diverse opinions (Banihashem & Aliabadi, 2017). The preceding viewpoint notes that online learning should not focus merely on transferring knowledge or information to students. Instead, students should access information sources and engage with the sources by working collaboratively with other students in co-constructing knowledge. In the collaborative learning exercise, the diversity of opinions is respected. There is, therefore, a need to understand how students utilise virtual learning spaces to actively engage with technology, knowledge sources and fellow students in constructing knowledge.

In connectivism, nurturing and maintaining connections are needed to facilitate continual learning in online learning (Banihashem & Aliabadi, 2017). The students should be connected through the available technologies. Students should also be connected to online learning resources and the course instructors. The issue of connectedness is vital in reducing isolation, loneliness and psychological distance, which are all associated with online learning (Hehir et al., 2021). In designing an online course, the instructor should plan to use digital teaching resources that promote student connectedness.

Connectivism as a learning theory also places great value on the connection between learning and real-life experiences (Moore, 2016). Of importance in the preceding observation is the view that virtual learning platforms and associated technologies should be utilised to assist students in learning by addressing real-life issues. Technology has pervaded people's socio-economic and political lives as most functions have been digitised, and people are connected through technology (Dufva & Dufva, 2018). There is, therefore, a need to connect the online student to real-life experiences in the technological and highly digitised world. In the context of the present study, the concept of the connectedness of students in the virtual learning environment while working to solve real-life technological issues was sought. The investigation of the nature of interaction in online learning was multifaceted and meant to bring out the different aspects of interaction.

The connectivist learning theory makes it obligatory for students to participate actively in their learning (Moore, 2016). In taking an active role in learning, online students are expected to be active students who engage directly with the course material through active involvement in online discussion, debate role-playing, and practice and application of what is learnt (Bernstein, 2018). Active learning contrasts with passive learning, where students may watch or listen to online lecturers without active participation. Students must be placed at the centre of learning in planning and implementing online courses in line with the connectivist learning theory. To this end, the course instructors should deliberately provide opportunities for students' interaction with the course content. The course instructors and fellow students have much online support (Moore, 2016). The present study pursued active learning aspects to understand students' online learning experiences.

The connectivist learning theory emphasises students learning collaboratively through online interaction, communication, and the easy flow of knowledge (Banihashem & Aliabadi, 2017). As informed by connectivism, the course instructors should reflect on utilising the LMS's different functions to enhance communication and interaction. High levels of interactivity should mark the virtual learning spaces. The students should exploit the collective strengths of a group as well as group motivation and support and, in the process, engage in the collective development of knowledge (Stoytcheva, 2017). It is also important to note that collaborating with others is an essential soft skill in the 21st century (Francis-Cracknell et al., 2019). The students develop essential values of cooperation as they learn collaboratively online.

Connectivism, according to Siemens (2005), notes that learning occurs when students can see connections between fields, ideas, and concepts. Establishing connections is an essential skill that students should develop. Ames (2016) observed that using inquiry-based instructional approaches, which provide opportunities for students to discover knowledge and information, is vital in teaching the making of connections. Through discovery learning in virtual learning spaces, the students engage in deep reflective learning through critical thinking (Ames, 2016). Such learning approaches promote more rewarding learning experiences than direct instruction. However, the use of more engaging teaching approaches rests on the quality of online course instructors in the planning and facilitating of online courses.

The connectivist learning theory postulates that the capability to know more is more critical than what is currently known (Siemens, 2005). It is, therefore, imperative that in teaching online, there is a need to inculcate in the students values of learning on their own to know more. As the students learn more, they can adapt to different changes and innovate (Zhao & Watterston, 2021). Learning becomes some means to an end, not an end. Such a learning view has pedagogical implications as online course instructors are expected to utilise student-centred and inquiry-based approaches (Wehmeyer & Zhao, 2020). Course instructors should be adequately trained and supported in online teaching endeavours to utilise appropriate approaches.

The connectivist learning theory is also premised on the view that all online learning activities should be based on current, accurate and up-to-date knowledge (Siemens,

2005). As Zalat et al. (2021) noted, students learning online should capitalise on the availability of current and up-to-date information from various internet sources to enhance their learning. There are no restrictions on access to current information online, and students should be taught information literacy, from the ability to search for information to the ethical handling of information available online. The multimodal nature of delivery in online learning exposes the students to rich sources of information (Lockee, 2021). The issue of access to current and up-to-date information is, therefore, a crucial aspect of learning online.

As a learning theory for the digital age, the connectivist learning theory emphasises decision-making as a learning process (Siemens, 2005). The students learning online are faced with many choices regarding the use of technology and the selection and use of information from varied sources. Making the right choices and decisions should be a skill and a value that permeates online curricula and teaching approaches (Mettas, 2011). Regarding decision-making, learning online involves the ethical use of information available online. It is further noted that it is essential to teach the students the proper use of technologies and the selection and use of information in ethically sound ways (Hamiti et al., 2014).

There are several strengths of connectivism as a learning theory in the networked and digital age, yet some criticisms are levelled against the same theory. According to Morrison et al. (2011), connectivism is more of an instructional theory than a learning one because it is prescriptive and situation-specific. Similarly, connectivism is explained as a theory of curriculum as it specifies education goals in a digital environment and how students should learn. It is less of a theory of learning (Verhagen, 2006, as cited in Veletsianos, 2010). However, whether connectivism is an explicit learning theory significantly informs online teaching and learning, hence the choice to utilise it as a theory framing the present study. In the next section, the researcher discusses how connectivism serves as the theoretical underpinning for the present study.

2.5.5 How connectivism informs the study

The way the theory informs the study is explored by looking at how the theory shapes the title of the study, assists in problematising research issues, identifies critical terms

for the study, illuminates areas for review of literature, identifies units of analysis, assists with methodological considerations and providing pointers for data interpretation and analysis.

2.5.5.1. Shaping the title of the study

The study's title is on exploring distance education students' experiences of interaction in online learning in a rural-based university. In conceptualising the study, an initial idea was to have an in-depth understanding of online teaching and learning. As noted by Grant and Osanloo (2014), theory-driven thinking assists in shaping the research topic. The connectivist theory introduced the researcher to the issue of connectedness, emphasising how the student learns by being connected in the technological space. The researcher then narrowed the topic to how, through connectedness, students interacted in virtual learning spaces, and the focus was on establishing such experiences. Furthermore, the observation by Siemens (2005) that connectivist learning involves dialoguing and discussion between and among students brought up the concept of student interaction as an issue of focus.

2.5.5.2 Problematising the research issues

A well-defined problem is central to a study based on a researchable topic. The connectivist learning theory revealed critical areas that required deliberate and systematic research to understand further. Figure 2.3 summarises some areas that assisted in problematising the research issues as informed by the theory.

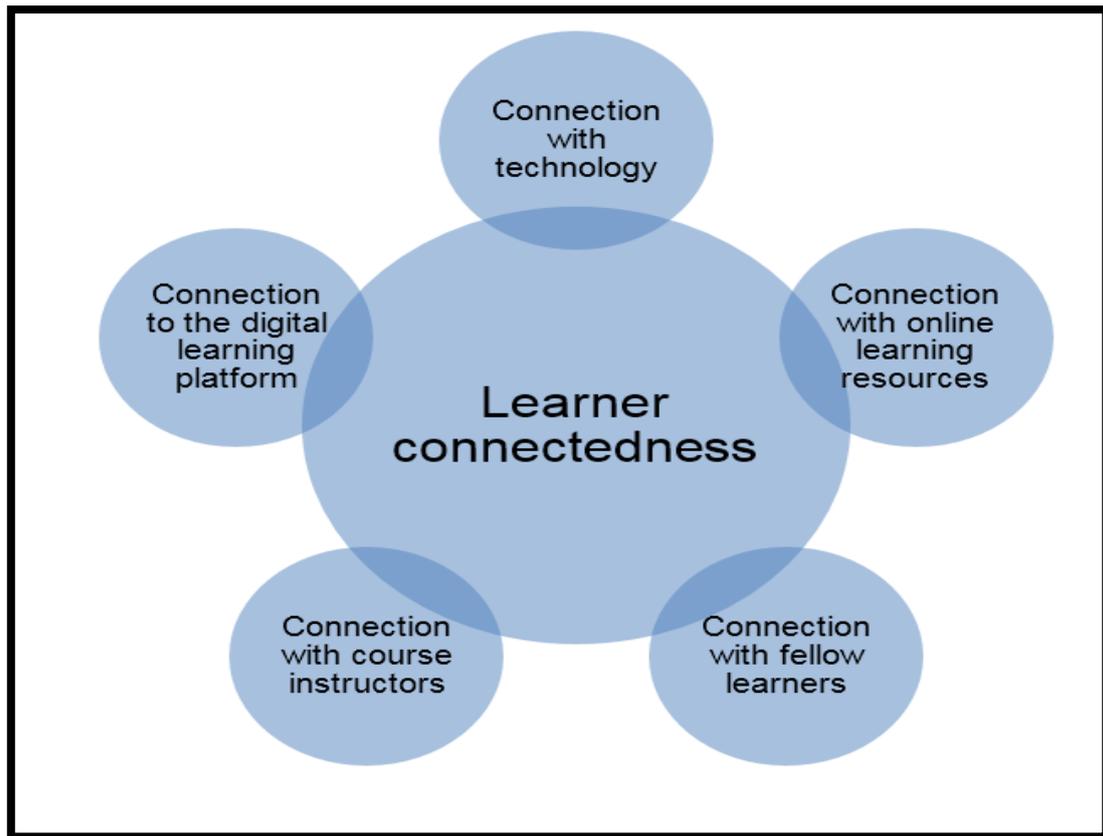


Figure 2.3: Critical issues drawn from connectivism (Source: Researcher's own)

To understand the critical issues related to the study as espoused by the connectivist learning theory, the researcher sought to establish the role of technology in interaction. Technology is central, and it was essential to ascertain the availability, accessibility, affordability and appropriate use of technology in online learning in ways that enhanced interactivity. The way students accessed online learning resources and shared them with fellow students was also considered pertinent and worth exploring. The students were also expected to interact with fellow students and course instructors online, and the nature and extent of this connection were also considered necessary. Online teaching and learning utilise a digital learning platform, and how course instructors and students exploit appropriate features of the platform contributes to heightened interactivity. The connectivist learning theory, therefore, assisted in greatly problematising the study.

2.5.5.3 Identifying pertinent terms

The connectivist learning theory and its fundamental tenets assisted the researcher in identifying and explaining one of the pertinent terms of the study, online learning, in the first Chapter, section 1.13. Through the connectivist learning theory, the researcher was exposed to concepts such as virtual learning, electronic learning, and web-based and digital learning, which all assisted in understanding and operationalising the meaning of online learning as learning that happens over the internet. In operationally defining the term, the theory assisted in understanding online learning as involving the students' skills and expertise in using the given technology.

2.5.5.4 Illuminating areas for literature review

The extensive discussion of the connectivist learning theory assisted the researcher in identifying critical areas for literature review. The connectivist theory attempts to discuss learning in the digital age as it happens through developing and sustaining connections online. The issue of online learning became the starting point in the literature review to understand what it entails, its forms and benefits, as discussed in the third Chapter, section 3.3.1. On the issue of developing and sustaining connections online, the connectivist learning theory assisted the researcher with indications of exploring the concept of interaction in literature, which was done in the third Chapter, section 3.3.2.

2.5.5.5 Identifying the unit of analysis

A unit of analysis is the "who" or the "what" the research will analyse in a study. According to Babbie (2012), it is crucial to properly define the unit of analysis so that the study's conclusions are drawn from the correct unit of analysis. The connectivist learning theory provides an understanding of learning in the digital age from the student's perspective, showing how the student learns. The unit of analysis in the present study became the distance education student. The study explored the distance education students' interaction experiences in online learning. Data were collected from the students as the unit of analysis to understand the issue under investigation from the students' point of view.

2.5.5.6 Assisting with methodological issues

The connectivist learning theory brought the complexity of digital learning to the fore, providing the researcher with insights into the importance of methodological plurality in the present study. To fully understand the issue under investigation, the researcher had to utilise a mixed methods research approach, as discussed in detail in the fourth Chapter (section 4.3). As noted by Molina-Azorin et al. (2018), the strength of a mixed-methods study is in how qualitative and quantitative approaches complement each other in a single study. The researcher, therefore, attributes the decision to adopt a mixed-methods approach to the present study to the connectivist learning theory and how it addressed the complexity of learning in the digital age.

Aspects of the connectivist learning theory assisted in designing the study's research instruments. The structured questionnaire and the focus group discussion schedule had question items drawn from the theory. Some of the question items sought information about the following aspects drawn from the theory:

- Specific aspects in which students worked with others online
- Nature and extent of collaboration with fellow students
- Ability to navigate the learning technologies
- Access to different sources of information, including OERs
- Nature and extent of knowledge creation and knowledge sharing online
- Access to current and up-to-date sources of information
- Nature and extent of decision in online learning

The fourth Chapter (Section 4.6) of the study discusses the data collection instruments whose question items included some of the issues highlighted above.

2.5.5.7 Providing direction for data interpretation and analysis

The connectivist learning theory also provided direction for interpreting and analysing data, especially on the qualitative aspect of the study. The thematic content analysis method discussed in the fourth Chapter was informed by the need to gain an in-depth understanding of the online interaction experiences of distance education students. The realisation in the connectivist learning theory that online learning should be looked at from different angles assisted in interpreting and analysing the collected qualitative data from a theoretical lens of the multifaceted nature of interaction in online learning.

2.6 THE COMMUNITY OF INQUIRY FRAMEWORK

This study is also informed by the CoI framework (Garrison et al., 2001), a process model of online learning that underscores the view that establishing and sustaining a community must be a deliberate objective of online learning and not something expected to be inherent. The CoI is a framework for the enhanced design, development and implementation of online learning in virtual spaces in ways that promote critical thinking, critical inquiry and dialogue among students and course instructors (Garrison et al., 2001). The CoI framework by Garrison (2009) is premised on the importance of students forming communities of practice to enhance their online learning experiences. The framework foregrounds the view that creating and developing deep and meaningful online learning is based on collaborative and constructivist principles.

2.6.1 The Community of Inquiry framework rooted in the collaborative-constructivist learning

In collaborative-constructivist learning, students learn collectively by building synergies with other students (Thoib, 2021). Building links in the learning process is an essential aspect of learning as it is consistent with establishing learning communities in online learning. In underscoring the importance of learning communities, Cegarra-Sanchez et al. (2018) note that online learning provides opportunities for students to share knowledge by utilising virtual spaces. Central to this observation is the students' ability to use technology to heighten online interaction, hence the importance of training and supporting students in technology use, especially in rural environments where technology integration in teaching and learning may not be well-established.

Online learning communities cater to student differences as students learn together, taking advantage of their strengths and weaknesses (Thoib, 2021). Learning by exchanging ideas assists students to learn from each other by drawing from individual expertise and experience. The more knowledgeable others assist, the less knowledgeable and, in the process, learning becomes a mutually beneficial exercise. In the context of the present study, which investigates online learning experiences of distance education students, the issue of learning communities is worth exploring to

promote interaction as distance education draws students with different learning styles, abilities and experiences.

Online learning communities support any-time interactions of students (Cegarra-Sanchez et al., 2018). Students learn online using computers connected to the internet, and there is synchronous and asynchronous interaction with course instructors and fellow students (Dhawan, 2020). Unlike in face-to-face traditional contact teaching and learning, where student interaction with course instructors and fellow students may be limited to the time allowed by physical meetings, the flexibility of online instruction is an obvious advantage. However, it must be pointed out that online interaction depends on several factors, such as the availability of appropriate devices and internet connectivity.

The utilisation of learning communities assists in promoting any-place interactions where the students' interaction is not restricted to a particular physical place (Dhawan, 2020). In distance education, for example, students are only sometimes in one centralised place, and networked technology allows students to interact from anywhere. It has, however, pedagogical implications on how the course instructor should build interaction as part of the online course design process. Schreurs et al. (2019) noted that an LMS has built-in and plug-in features that can be utilised effectively for student interaction in pedagogically sound ways. Student interaction should be planned as online courses are designed and developed.

The collaborative-constructivist view of learning in which the Col is rooted provides opportunities for equal participation in learning. In instances where there is unequal participation in online learning activities, it becomes a threat to collaborative learning, and this negatively affects student persistence and students' satisfaction in online courses (Capdeferro & Romero, 2012). It is, therefore, imperative that in designing and implementing online courses, the course instructors attend to issues of equal participation. All the students need a sense of belonging when allowed to participate freely and on equal terms with others in all the set online learning activities. A case in point is how a course instructor manages online group discussions in ways that allow the students to participate equally.

In the collaborative-constructivist learning perspective, students should be allowed to reflect on their learning (Chang, 2019). Through reflection, students are provided with opportunities to document their learning journey and, in the process, think deeply about the learning process, which is vital in developing students' lifelong learning capabilities (Helyer, 2015). Lin et al. (1999, p. 46) observed that "Reflective thinking is an active, intentional, and purposeful process of exploration, discovery, and learning." Students may use online tools such as e-portfolios to engage in self-reflection or reflective dialogues as they develop reflection skills. Using the e-portfolio, the students can utilise multimodal digital presentations to document their learning and, in the process, develop thinking and problem-solving skills necessary for lifelong learning (Chang, 2019).

2.6.2 The three 'presences' in the Community of Inquiry framework

According to the Col framework, meaningful online learning experiences depend on the interdependence of three 'presences', namely the social, cognitive and teaching presence. In the Col framework, the presences are viewed as the functions performed and shared by the course instructor, the students and the course materials (Ice & Nagel, 2010). The cited three 'presences' are the critical components of the Community of Inquiry Framework. Fiock (2020) notes that meaningful and higher-order learning depends on how students can build communities and ensure interaction. The three 'presences' become essential to understanding the nature and extent of interaction in online learning. Each 'presence' in the Col model frames aspects of the learning environment that capture interactions among students, instructors, and content. The interdependence of the three 'presences' is shown in Figure 2.4;

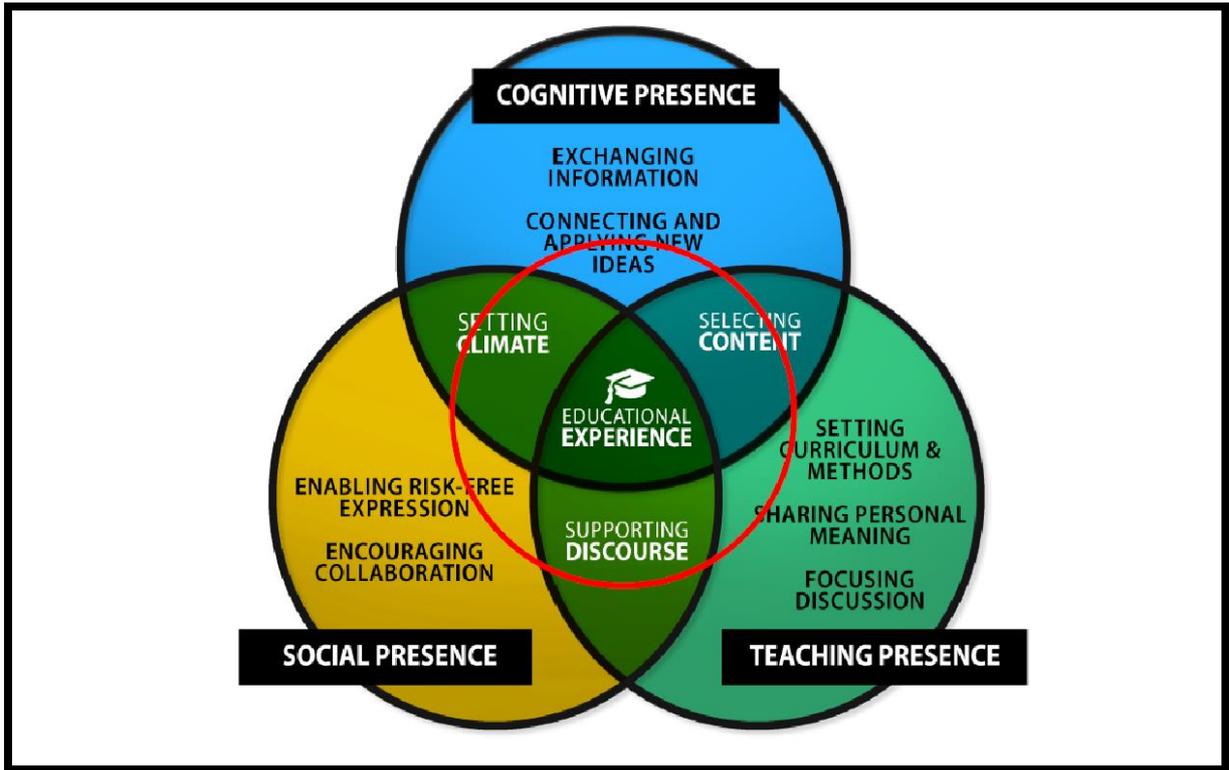


Figure 2.4: Community of inquiry framework. (Recreated version from Garrison et al., 2001, p. 88).

The interdependence of the three 'presences' in a learning community predisposes students to participate in meaningful inquiry and deep learning, which are essential for any higher education system. While the emphasis is on the interdependence of the three 'presences,' it is crucial to have a deeper understanding and appreciation of each of the 'presences' as highlighted in the following three subsections.

2.6.2.1 Cognitive presence

Cognitive presence is "the extent to which the participants in any particular configuration of a community of inquiry can construct meaning through sustained communication" (Garrison et al., 2001, p. 89). The emphasis is placed on constructing meaning, and this alludes to the fact that online students should be involved in cognitively challenging learning tasks on which they work collaboratively with other students in co-creating and sharing knowledge. Communication points to the importance of clear instructions before students undertake any activity and sustained feedback on the students' progress through helpful comments that guide the learning process.

In cognitive presence, students should be able to construct and confirm meaning through sustained reflection (Anderson et al., 2019). The component of reflection becomes an essential one in the online learning process. For example, challenging questions through probing and prompting in discussion tasks allows students to think deeper and critically about issues. Critical thinking is a soft skill required in graduate attributes for the 21st century. In underscoring the importance of self-reflection and critical thinking, Mthethwa-Kunene et al. (2022) aver that 21st-century graduates need skills that will enable them to function well in the socio-economic and political environment.

According to Garrison et al. (2001), cognitive presence may be understood in terms of a four-stage process of practical inquiry. The first stage entails triggering an event, where an issue or problem is identified and defined for further inquiry. At the exploration stage, the students engage in an in-depth exploration of the issue or problem by working individually and as a community through reflection and discourse. The third stage of integration is where students construct meaning from ideas developed during exploration, and this process results in solutions to a problem, where students apply the new knowledge (Garrison et al., 2001). The need to practically involve the students in the problem-solving processes as they learn is of importance in the practical inquiry approach.

Cognitive presence in the Col framework is about learning through sustained discourse (Anderson et al., 2019). Since the students access their course content and learning activities online, there is a need to provide self-instructional materials that guide the students in the learning process. The course instructor's voice should be embedded in the material and activities to engage the students fully in the learning process. As Iqbal et al. (2019) noted, self-instructional materials should fully engage the students in learning.

The issue of discourse also extends to opportunities for communication and collaboration of students with peers and the course instructor. The student exchanges knowledge and ideas with others using synchronous and asynchronous discussion activities. As Aderibigbe (2021) observed, using discussions provides opportunities for the students to develop the necessary skills in the subject content, work collaboratively with fellow students, and engage with the course instructor. Online learning is often

associated with student isolation, hence the need for sustained discourse to keep the student engaged and connected.

To enhance cognitive presence in online learning, the course instructors should develop learning modules that provide endless opportunities for active learning. According to Ferns and Duffy (2019), active learning is a pedagogical approach involving teaching approaches and strategies that actively engage students with course material and fellow students. The course instructors should use activities that allow the students to apply their minds, individually and collectively, in working on the given tasks. It would also assist students in obtaining immediate feedback as they work online. Ferns and Duffy (2019) further noted that such feedback is essential for remediation and enrichment of the learning process.

In content presentation, cognitive presence is also promoted by providing various types of content and assignments in various multimedia formats (Akhter, 2017). Content may be in simple text, video or audio formats, allowing students to engage as individuals or groups. Content presented in different formats should allow students to participate in the learning process actively. Problem-based and case-based learning make learning purposeful in solving challenges in virtual spaces. Problem-solving learning allows students to develop problem-solving, communication and interaction skills as they work with their online partners to exploit virtual spaces to solve real-life problems (Aslan, 2021). Learning ceases to be theoretical as students apply their knowledge and problem-solving skills.

Of importance in the cognitive presence is the course instructor providing the online students with opportunities to connect and apply new ideas. The students learning online must be exposed to higher-order learning outcomes in which they apply what is learnt (Ferreira et al., 2018). Such an approach is consistent with Bloom's digital taxonomy, where learning with technology goes beyond applying to creating, and students are expected to design, produce, invent, publish or even broadcast (Churches, 2009). The emphasis on higher-order learning outcomes is essential in providing opportunities for students to take charge of their learning in virtual learning spaces (Wedlock & Growe, 2017). In line with promoting higher-order learning outcomes, the students may be allowed to work collaboratively on group tasks, emphasising creativity (Raymundo, 2020).

Cognitive presence in online learning may be enhanced using Virtual Reality. A view advanced by Kenwright (2018) is that VR is a computer-based technology that offers students a collaborative and multi-sensory learning experience. Similarly, Inoue (2012, p. 3407) defines VR as "an interactive computer-based application that provides a synthetic digital environment – and thus, virtual reality provides a way to simulate environments, objects, actions, and processes." It is also known as artificial reality, virtual worlds, or cyberspace.

VR increases students' engagement in online learning by interacting with them in many ways. VR is a related technology that leverages computer technology to create an artificially created digital experience. VR heightens student engagement, and simulation-based technology allows students to experience what they learn as they participate, which is challenging and promotes retention of what is learned. The 3D virtual learning systems offer interactive environments with a more immersive and social learning experience. It is essential to note that rural-based universities whose online teaching and learning initiatives may still be developing may find it challenging to realise the benefits of VR in online learning.

Gamifying the learning environment is another way of ensuring cognitive presence in online learning. Deterding et al. (2011) explain that gamification uses games, game mechanics, and techniques ordinarily applied in traditional educational game activities. Similarly, Clark et al. (2016) note that some game elements are utilised in gamification in non-game settings. It is clear that games may be adopted and adapted to achieve specific learning outcomes or game elements are incorporated into the learning process. Through gamification, learning becomes competitive and exciting.

2.6.2.2 Teaching presence

Teaching presence is explained by Anderson et al. (2019, p. 5) as the "design, facilitation, and direction of cognitive and social processes to realise personally meaningful and educationally worthwhile learning outcomes." From the preceding explanation, teaching presence commences with the appropriate course design and development. In the design and development process of the online course, the instructor deliberately organises the online learning experiences to attain the learning outcomes. According to Baker and Taylor (2010), a course instructor is deemed

'present' in an online course when 'visible' to the students taking an online course. The students should feel the course instructor's presence, support and guidance.

Teaching presence should also be felt in online learning by outlining student expectations from the onset of an online course. According to Hart (2012), there should be a precise alignment between the online students' and course instructors' expectations in an online course. The clarifications of expectations include stipulating the roles of student and instructor, the nature and extent of peer interactions, the precise organisation of the course organisation, and the use of technology (Bork & Rucks-Ahidiana, 2013). A misalignment of the expectations may lead to the frustration of online students who may end up dropping out of the course.

Teaching presence is also evident in the design and organisation of an online course. At the start of a course, all students' expectations about the course should be outlined. As Khan et al. (2017) observed, online students must have all the course expectations outlined from the onset. Once the expectations are outlined, it provides the students with the necessary guidance as they navigate the course in virtual spaces. The learning outcomes should be spelt out, and such outcomes should be aligned with the content and learning and assessment techniques. In constructive alignment, as Biggs (2014) explained, the intended learning outcomes should be stated before learning takes place. Furthermore, teaching and assessment methods should be connected to the outcomes in ways that make it easy for students to achieve them.

Teaching presence is also marked by how the course instructor facilitates discourse on online discussion. It has been noted that online classes' success depends on how online discussion is carried out and that online discussion should create a platform on which online students learn and grow as they create and share knowledge in a learning community (Lee, 2020). The course instructor should facilitate online discussion that promotes critical and deeper thinking in students through timely probing and prompting, settling disagreements and clarifying issues. The course instructor should encourage insightful contributions and deal with participants who would dominate the discussion, thereby denying others the chance to be heard.

How the course instructor conducts direct instruction contributes to teaching presence in online learning. One way of conducting direct instruction effectively is by providing

intellectual and scholarly leadership. The course instructor is a discipline expert who should be able to influence the students' behaviour in a technologically mediated virtual learning environment (Alotebi et al., 2018). The online students should be provided with clear direction on the subject matter through the able leadership of the course instructor.

In teaching presence, the course instructor should keep the online students engaged with the content all the time (Chen et al., 2021). Keeping the students engaged depends on the course instructor's ability to employ online active learning strategies. As Khan et al. (2017) noted, students in online learning environments may be kept engaged through well-planned discussions and other group activities. In such activities, the students develop essential teamwork and collaborative problem-solving attributes. The teacher's presence should be felt in all the active learning activities through clear instructions, facilitation and feedback provision.

The course instructor should also provide the online students with relevant, rich and up-to-date content, which is a good sign of teaching presence. The online course instructor should be thoroughly grounded in discipline content knowledge, with a remarkable ability to apply and relate content to the realities of the socio-economic, political and technological environment (Adhiambo, 2021). In other words, the course instructor should not be theoretical in discipline expertise but able to apply knowledge to real-life situations. The course instructor should keep abreast of the changes and developments in the discipline.

Teaching presence is also evident in the way assessment is handled in an online environment. Gikandi et al. (2011, p. 2334) observe that "teaching and learning processes need to be assessment-centred to provide students with opportunities to demonstrate their development of skills and receive support to enhance their learning." Effective assessment techniques are central to effective online teaching and learning as the students should be assessed formatively, and immediate and rich feedback is provided to guide the learning process. The course instructors should embrace e-assessment and utilise the ICTs to assess students and students' work online (Sianou-Kyrgiou & Tsiplakides, 2012). Different digital tools would assist in assessing, marking, reporting, storing and analysing performance (Fontanillas et al., 2016).

The course instructor should provide clear expectations on assessment tasks, and timely feedback should be provided for all the assessment tasks (Hasiri, 2021). In instances where course and assessment expectations are not clarified to the students, it may result in confusion and anxiety in students. It may contribute to frustration and attrition from an online course (Luck & Rossi, 2015). It is, therefore, imperative to clarify course and assessment expectations from the onset. The provision of feedback is also a vital issue. Some feedback could be immediate, taking advantage of the technological features of the Learning Management System. According to Bloom's taxonomy of educational objectives, course instructors should also use assessment tasks that promote higher-order thinking (Adams, 2015).

Teaching presence should permeate the course facilitation, with the instructor exhibiting pedagogical, managerial, social and technical skills. These are what Khurshid (2020) terms e-pedagogical skills. In e-pedagogical skills, different appropriate teaching and learning approaches should be utilised to cater to the different learning styles (Huang, 2018). The course instructor should be a manager of the online learning process, providing the necessary guidance and support. Online students are also required to be treated as human beings with emotions, and by attending to the emotional needs of the students, the course instructor brings the social element into learning (Taylor, 2015). Whenever the students require technical support, the first point of contact should be the course instructor, who can assist with technical matters.

In an online course, teaching presence is optimised by the course instructor's setting of clear course expectations (Sheridan & Kelly, 2010). At the beginning of the course, the course instructor should provide students with a course outline that stipulates all the course expectations. A course outline should provide students with prerequisites for the course, course description and objectives, expected learning outcomes, course materials and how to locate them, learning approaches and expectations, assessment approaches and rubrics, assessment tasks, and technical support, as well as ethical issues such as anti-plagiarism. The setting of clear expectations from the onset, as noted by Sogunro (2017), is an essential component of quality instruction. It would be necessary to establish how course instructors exploit features of an LMS to set clear course expectations.

In establishing the teaching presence in an online course, the course instructor should be able to make significant and timely announcements. Announcements become an essential first point of contact for online students with the course instructor every time they log onto the course (Pritts, 2020). Using timely and transparent announcements provides clear guidance to the students as they learn online. Announcements are the course instructor's voice that shows an implicit presence of the instructor in the learning process.

The course instructor is also expected to provide clear instructions on tasks conducted by the students online as a critical aspect of teaching presence. Rhalmi (2010, p. 1) avers that "the most important point that determines how successfully students will learn is the way instructions are formulated," The preceding statement suggests a correlation between the nature of instructions given and how students perform in the given task. In online learning, it may be difficult for students to seek clarification, hence the need for clear instructions on the given tasks. Breiburd et al. (2017) further observed that instructions should be clear, specific and concise.

Facilitation of discourse is another helpful way of maintaining and sustaining teaching presence in online learning. Discussion is an essential online learning tool, and the course instructor should be able to facilitate online discussion for enhanced learning. Lima et al. (2019) noted that discussion forums on a Learning Management System are significant as a tool to promote the exchange of information, reflection and interaction of online students. The course instructor should be able to pose relevant and engaging questions and probe and prompt students to reflect on their responses and those of others—effective facilitation of discourse in online discussion results in meaningful teaching presence.

The issue of providing meaningful, detailed and timely feedback in online learning is meaningful in heightening teaching presence (Conrad & Donaldson, 2012). The nature of the feedback provided to students and how timeous it is guides the students towards the attainment of learning outcomes; as further noted by Conrad and Donaldson (2012), meaningful online feedback is crucial as it provides information on strengths and inadequacies of performance, allowing students to build on their strengths and address their challenges. Constructive feedback can be provided to the student from both the course instructor and fellow students. Positive feedback from the instructor

encourages and motivates students to be active participants (Atkinson & Lim, 2013). The course instructors should, therefore, use different computer-mediated communication systems such as computer conferencing systems, audio recording software, email, and video recording devices, among others, to provide constructive, meaningful, clear and timely feedback to enhance online learning.

2.6.2.3 Social presence

Effective online teaching and learning should be marked by the social presence of the students and the course instructor. Garrison (2009, p. 352) defines social presence as "the ability of participants to identify with the community (e.g., course of study), communicate purposefully in a trusting environment, and develop interpersonal relationships by way of projecting their personalities." As further noted by Akcaoglu and Eunbae (2016), social presence is a compulsory element in online learning since the desire to maintain social connections is a human need.

The social presence in online learning is essential in addressing the students' emotional needs (Kaplan-Rakowski, 2020). Despite learning online, the students remain human beings with feelings and emotional needs that should be accommodated in virtual learning spaces (Akcaoglu & Eunbae, 2016). The course instructors should find ways of addressing the online students as individuals, appreciating their presence in the online learning environment. Online students should feel emotionally secure as they deal humanely with course instructors and other students. When students are emotionally secure, this will invariably positively affect their learning and ultimate attainment of the set learning outcomes.

Social presence in online learning is evident through well-planned and sustained engagement (Whittle et al., 2020). According to Kahu et al. (2014, p. 523), student engagement is defined as "a student's emotional, behavioural and cognitive connection to their study", and such engagement directly affects the student's success and achievement. The course instructors should utilise online pedagogies that promote and nurture the student's connection to his or her studies. The online student should not feel lonely but should feel connected to the course instructor and other students.

Social presence in online learning is heightened by interacting with other students (Rapanta et al., 2020). As observed by Rodriguez-Ardura and Meseguer-Artola (2016), interaction in online learning involves the online students' participation in online learning activities synchronously or asynchronously. Furthermore, Van den Berg (2020) notes that the nature and extent of students' interaction is an essential factor contributing to the success of online learning. One way of enhancing student interactivity in online learning is the involvement of the students in online discussions where they share knowledge and learn from others.

The students should utilise virtual learning spaces to build and sustain a learning community (Sobaih et al., 2020). Garrison (2007, p. 61) defines an online learning community as "a group of individuals who collaboratively engage in purposeful critical discourse and reflection to construct meaning and confirm mutual understanding." In an online learning community, the students can co-create and share knowledge with others. The students communicate with others in constructing knowledge and learn important values of collaboration and teamwork.

Social networking sites or social media such as Facebook and WhatsApp may be incorporated into the online learning environment to enhance social presence (Weidlich & Bastiaens, 2019). Social media has pervaded people's social lives in the modern day and provides excellent opportunities for online students to be socially and collaboratively connected as they learn online (Elverici, 2021). As further noted by Chen (2018), using social media in an online learning environment enhances the students' social presence by enabling them to be in touch with others, get social support and create and share information with others.

2.6.2.4 Criticism of the Col

Some criticisms are levelled against the Col framework despite the immense illumination of how learning should happen online. One of the criticisms is that the Col framework places prominence on three presences, namely cognitive, social and teaching and downplays the role of technology in the online teaching learning milieu (Walisundara, 2017). The multimodal nature of technology is also crucial in shaping the nature of online learning experiences for online students. In understanding online learning, one must recognise the role of technology as the nature and extent to which

the students can use technologies utilised in learning influences direct access to online course content and participation in online collaborative learning activities (Walisundara, 2017). The issue of technology influencing interaction in online learning was considered seriously in the present study.

Shea and Bidjerano (2012) contend that students should be fully accountable for their education in virtual learning environments by using self-directed and self-regulated learning strategies, which is why they support the inclusion of learning presence in the Col. The self-directed characteristics of remote learning students are directly addressed by the "learning presence". This is especially relevant to the current study because distance education necessitates a high level of autonomy and self-direction on the part of the students. Learning presence is crucial because it enables students to navigate, manage, and control their own learning processes in online environments in addition to interacting with classmates, instructors, and the material (Shea & Bidjerano, 2012).

2.6.3 How the Col Framework informs the study

In this section, the researcher discusses how the Col underpins the present study, showing how the theory 'frames' the study.

2.6.3.1 Shaping the title of the study

The title of the present study is about the online interaction of distance education students. The concept of interaction is at the core of the Col. Hence, the wording of the study's title gives prominence to interaction. In shaping the title, one should be specific in stating the main point of focus of the study and the unit of analysis. In the title, the issue of interaction experienced by distance education students in virtual learning spaces was foregrounded as informed by the Col.

2.6.3.2 Problematising the research issues

The Community of Inquiry framework assisted the researcher greatly in understanding the problem triggering the undertaking of the present study. Exposure to the three 'presences' provided more profound insights into interaction in online learning. The theory illuminated the desire to explore the nature of interaction experienced by distance education students in the light of the presence, including interaction with

technology. The first sub-research question focused on the students' understanding of interaction, and the purpose was to ascertain the understanding through the theoretical lens. The second sub-research question on the benefits students derived from interaction also stemmed from the four 'presences' by understanding how interaction impacted learning.

2.6.3.3 Identifying pertinent terms

The Col framework also assisted in identifying and defining three key terms: interaction, learning community and collaborative learning. The three identified terms are part of discussions around the Col framework, and they assisted in clarifying essential concepts in the present study.

2.6.3.4 Illuminating areas for literature review

The Col framework proved very useful in assisting the researcher in identifying areas for review of literature. Section 3.3.1 on defining online learning in the third Chapter was deemed necessary in providing a thorough understanding of the concept of online learning as the Col is a theory that seeks to explain what obtains in online learning. The researcher also devoted a whole section to interaction in online learning, and section 3.3.2 in the third Chapter highlighted the different facets of interaction, drawing from the Col framework. The section on the benefits of online learning in the third Chapter of the study (section 3.4) hinged on how the different types of interaction influenced teaching and learning in online environments.

In the third Chapter on the review of related literature, the researcher also reviewed the literature on student support for interaction in online learning (as shown in section 3.5). Elements were drawn from the three 'presences', namely cognitive, teaching and social presences, indicating how online students could be supported to enhance their interaction levels in online learning. In section 3.6 of the third Chapter, the researcher reviewed the literature on factors that promote or hinder interaction in online learning, and the Col framework provided the theoretical lens for looking at the issues. In the last section (Section 3.7), discussing interaction and online pedagogies, the researcher drew heavily from the Col framework to understand how teaching could be conducted online to enhance interaction.

2.6.3.5 Identifying units of analysis

The Col framework also assisted the researcher in establishing the distance education students as the unit of analysis in the study. As Kumar (2018) noted, a unit of analysis is a person or object from which the researcher seeks to collect data or the entity for analysis. In the present study, as informed by the Col framework, interaction revolves around the student as one involved in online learning. There was a need to focus on the students in distance education and understand their experiences in online interaction.

2.6.3.6 Assisting with methodological perspectives

In understanding the issue of interaction holistically by addressing three 'presences', namely social, teaching and cognitive, the research sought to follow a mixed methods approach, which is explained in detail in the fourth Chapter (sections 4.3.1 and 4.3.2). In bringing out the three presences and how they influence online teaching and learning, the Col framework looks at online teaching and learning in detail and from different angles. This points to the need to utilise a research approach that addresses qualitative and quantitative aspects of a phenomenon, hence the mixed methods approach.

2.6.3.7 Providing pointers for data interpretation and analysis

The choice to collect quantitative and qualitative data sets in a single study, as informed by the Col framework, also led to the need to analyse data statistically and through thematic content analysis, as explained in the fourth Chapter, sections 4.8.1 and 4.8.2. To gain a complete understanding of the results, the two data sets were merged at the interpretation stage, to establish the complementary nature of the two data sets in providing conclusions.

2.7 CONCLUSION

In this chapter, the research discussed the theoretical underpinnings of the study. The connectivist learning theory and the Community of Inquiry framework, as the two main theoretical underpinnings for the study, were discussed in detail, highlighting the central tenets and how the tenets linked with the present study. The researcher also showed how the two theories served as underpinnings of the study by discussing how

each one of the two theories assisted in shaping aspects of the present study, such as refining the research title, problematising the research issues, identification of pertinent terms, identification of areas for literature review, identification of the unit of analysis, assisting with methodological perspectives and providing pointers for data interpretation and analysis. The next chapter focuses on a review of literature germane to the study.

CHAPTER THREE

THE ONLINE INTERACTION TERRAIN AND POLICY CONTEXT

3.1 INTRODUCTION

The researcher discussed the theories underpinning the present study in the previous chapter. The connectivist learning theory and the Community of Inquiry framework inform the present study, and the researcher discusses the central tenets of the two theories. The previous chapter further showed how the connectivist learning theory and Col framework informed the present study. In this chapter, the researcher reviews literature related to the study. Figure 3.1 summarises the key concepts around the undertaking of the literature review in this chapter.

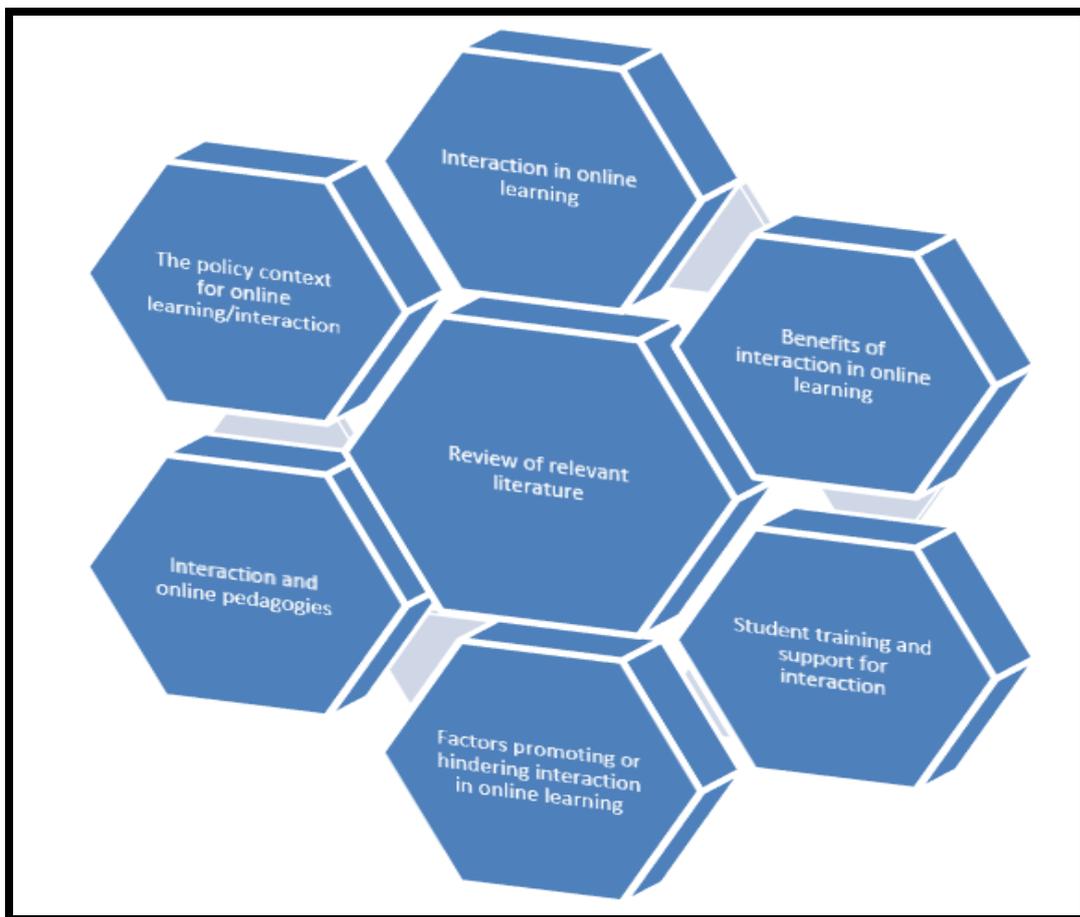


Figure 3.1: Summary of issues covered in the literature review (Researcher's own).

As shown in Figure 3.1, the process of undertaking a review of the literature commences by unpacking the literature review and its role in research. The concept of interaction in online learning is discussed by first assessing online learning as a mode of educational delivery in the digital world. The discussion also centres on the benefits of interaction and ways of ensuring student support for interaction in online learning. The literature review also assesses the enabling and hindering factors for interaction in online learning. The review ends by discussing the pedagogical implications of interaction in online learning. The discussion also focuses on the policy context of online learning.

3.2 LITERATURE REVIEW AND ITS ROLE IN A RESEARCH STUDY

In this section, the researcher defines the literature review, what it entails, and its pivotal role in a research study.

3.2.1 Unpacking literature review

According to Winchester and Salji (2016, p. 308), a literature review is "an evidence-based, in-depth analysis of a subject." This means that the researcher should consult multiple and varied sources to critically analyse issues and gain a deeper understanding of issues related to one's study. Similarly, Maggio et al. (2016, p. 297) argue that a literature review is "a synthetic review and summary of what is known and unknown regarding the topic of a scholarly body of work, including the current work's place within the existing knowledge." A literature review entails critical engagement with works related to one's study to build on what already exists.

A literature review, as further observed by Maggio et al. (2016), assists the researcher in "joining the conversation" by engaging in the debates around one's study. In joining the conversation, the researcher can locate their research area within the wider academic community of the scope of research. The researcher is familiar with essential scholars in the study area and the critical viewpoints that would have been advanced. Understanding developments around the study assists in separating one's study from existing ones by providing a clear focus and unique contribution of the study undertaken to the body of knowledge.

In reviewing existing literature, the researcher establishes the knowledge and ideas already conveyed on a topic by consulting published works (Pejić-Bach & Cerpa, 2019). The researcher assesses the significant debates on the topic under study, showing the strengths and weaknesses of the arguments and highlighting the outstanding issues. It is important to note that the published works consulted for review should be varied, relevant and related to one's study. Therefore, textbooks, published peer-reviewed journal articles, book chapters, periodicals and conference proceedings, among others, may be consulted.

3.2.2 role and functions of a literature review in a research study

The conducting of an extensive and intensive review of relevant literature by a research student is premised on the view that no research is conducted in a vacuum. As noted by Winchester and Salji (2016), a research study should be contextualised, and this is only possible by engaging in contemporary debates around the area of study. The researcher should be able to place his or her study in proper context by issues around the study to avoid duplicating issues or merely 'reinventing the wheel.' Hence, the importance of showing the areas in which one's study will differ from what has already been done.

A comprehensive and systematic literature review allows the researcher to identify gaps in the literature that he or she should fill. Webster and Watson (2002, p. xix) noted that "a review should identify critical knowledge gaps and thus motivate researchers to close this breach." It is only possible to identify knowledge gaps in the literature by conducting an extensive survey of what has already been done. The researcher should be able to analyse previous works concerning the work. Any knowledge or methodological deficiencies of the previous works would be highlighted to address the gaps.

A literature review also assists in bringing clarity and focus to one's research problem (Paré et al., 2015). A researcher's issue of investigation is best understood in the wider scholarly community of the discipline or topic. It is, therefore, prudent for the researcher to read broadly and analyse issues around the proposed research problem. Such an analysis provides new insights into the research problem and assists the researcher in gaining a clearer understanding of the research issue. The focus of the

study may be adjusted because of the new insights, which may result in redefining the research topic and questions.

A well-carried literature review assists the researcher in identifying research gaps (Robinson et al., 2011). A study should be carried out after referring to related research studies to establish what has been researched and is still outstanding. The issue of identified research gaps is crucial for doctoral studies, which are expected to contribute to new knowledge in terms of policy and practice. A study is, therefore, deemed original if it does not replicate other studies but makes a unique contribution by addressing identified research gaps.

A literature review may reveal some methodological gaps in previous works, and this would assist the researcher in improving his or her research methodology (Jesson et al., 2011). Upon embarking on a research study, a researcher may need clarification about the methodological processes and procedures. However, by familiarising oneself with previous studies undertaken by other scholars, a researcher may identify methodological gaps. The methodological gaps may then be exploited in the researcher's study. Researchers in previous studies may indicate methodological challenges encountered, which would assist the researcher in undertaking his or her study by being aware of the challenges or pitfalls.

A literature review also helps broaden the researcher's knowledge base in the selected research area (Rowe, 2014). One must effectively conduct a study with a deeper and broader understanding of the research area. A broad knowledge base assists the researcher in further understanding essential variables of the study, hence crafting appropriate hypotheses or research questions. The researcher should also be familiar with scholarly debates in the research area to contribute meaningfully to the topic or discipline. Broadening the knowledge of an area helps identify topics or questions requiring more investigation (Paré et al., 2015). In the context of the present study, it was deemed essential to understand debates and scholarly thoughts around interaction in online learning.

Paré et al. (2015) further noted that a literature review helps the researcher generate new frameworks and theories for the study. As the researcher interrogates works

conducted by other researchers, there is exposure to conceptual and theoretical frameworks employed and how they were utilised. Such exposure allows the researcher to adopt and adapt the conceptual frameworks relevant to one's study. In the context of the present study, the researcher commenced the study with a desire to utilise only the Col framework as a theoretical underpinning. However, the review of literature exposed the researcher to how the connectivist learning theory was utilised in related studies by Mpungose (2020), Mpungose and Khoza (2020) as well as Kumar et al. (2021). In the end, connectivism was accommodated as a theory underpinning the study, as shown in the second chapter (section 2.5).

A literature review should allow the researcher to expand knowledge beyond a single setting (Maggio et al., 2016). Of importance in the preceding view is the need to review published works on a topic as drawn from different contexts. In the context of the present study, works from Europe, America, Asia and Africa, among other contexts, were reviewed. The purpose was to understand and appreciate issues around interaction in online learning as they happen in the developed and the developing world. The present study is centred on a sub-Saharan African country, yet it is essential to expand one's viewpoints by looking at phenomena in different contexts.

3.3 THE CONCEPT OF INTERACTION IN ONLINE LEARNING

In this section, the concept of interaction in online learning is explored. The general concept of online learning is discussed as a precursor to interaction in online learning.

3.3.1 Defining online learning

Online learning is "learning experiences in synchronous or asynchronous environments using different devices (e.g., mobile phones, laptops) with internet access. In these environments, students can be anywhere (independent) to learn and interact with instructors and other students" (Singh & Thurman, 2019, as cited in Dhawan, 2020, p. 7). Similarly, online learning refers to a learning environment that uses the Internet and other technological devices and tools for synchronous and asynchronous instructional delivery and management of academic programs (Huang, 2019; Usher & Barak, 2020). In online learning, as shown in the preceding definitions,

learning utilises the relevant electronic devices connected to the Internet. The virtual learning activities may be live or delayed.

A more comprehensive definition of online learning is provided by Anderson (2011, as cited in Rapanta et al., 2020), and the definition alludes to the geographical separation of the student and the course instructor, with technology being utilised to bridge the separation by allowing communication and teaching in real-time and in delayed ways. In this mode of delivery, the online student utilises technology to interact with the course instructor and other students, and of importance is online support that is provided to students as they learn in virtual spaces. As further noted by Bates (2020), online learning involves deliberate and pedagogically informed planning and implementation of online courses.

Of importance in online learning is the flexibility and convenience of learning, as learning is not restricted to the walls of the classroom. The students can learn from any place and at any time. The students can also take charge of their learning as independent students, individually and collaboratively. As noted by Dhawan (2020), through online learning, students can learn anytime and anywhere and, in the process, develop crucial lifelong learning skills. Live lectures afford the students and course instructors real-time interactions, and the students can obtain immediate feedback (Littlefield, 2018).

Online teaching and learning may utilise video conferencing approaches that allow course instructors and students to live interaction (Basilaia et al., 2020). The threaded discussion in synchronous and asynchronous ways may be utilised to enhance interaction and collaboration. The possibility of students accessing live and recorded lectures makes online teaching and learning rich, and such learning may be accessed through mobile devices, allowing students to learn on the go (Lynch, 2020). However, it is essential to note that online learning may contribute to unequal access to education due to the digital divide. Students from deprived socioeconomic backgrounds may need more resources and infrastructure for online learning. The challenges must be addressed because, as Dhawan (2020) notes, online learning is no longer an option but a necessity.

Online learning often utilises a selected digital learning platform, a Learning Management System (LMS). An LMS is an online system or software used to plan, execute, and assess a specific learning process (Suradi et al., 2018). An LMS can create, foster, deliver, and facilitate learning anytime and anywhere (Swart, 2015). As e-learning software, it assists with the administration, documentation, tracking, and recording of learning activities. There are open-access LMS software such as Moodle and Sakai and some commercial ones such as Blackboard. The choice by institutions considers the financial implications. The effective use of an LMS depends on how the course instructors and students are trained and supported. There are features of an LMS that may be utilised for collaborative learning activities and features such as discussion forums should be utilised for enhanced online learning experiences.

Whilst online learning offers a convenient and flexible approach to learning consistent with the digital age (Bates, 2020), it has numerous challenges. Online learning may result in unequal access to education due to the digital divide or digital inequality (Mathrani et al., 2021). Individuals and institutions in different countries have different levels of digital competence and access to technological infrastructure and resources. There is a massive gap between those with the competence and access to digital resources and those without. This disparity has severe implications for access to education. Education is for the privileged class, leaving out children from disadvantaged backgrounds.

In developing countries, the digital divide is vast, as there are significant disparities between those who have access to ICTs and can use them and those who do not have access and cannot use the technologies (Ranieri et al., 2018; Rogers, 2016). The disparities result in digital exclusion, which has severe implications for equal access to education and is a serious social justice issue (Sianou-Kyrgiou & Tsiplakides, 2012). The University of Eswatini, in which the present study was carried out, is a rural one with disparities in the access and utilisation of technologies for online learning. There is, therefore, a need to address issues of the digital divide by supporting students and course instructors to realise the benefits of online learning for all.

3.3.2 Interaction in online learning

In this section, the concept of interaction in online learning is explored. First, interaction is defined, scholarly and operationally, and the different types of interaction in online learning are assessed.

3.3.2.1 Defining interaction

Interaction is "the student's engagement with the course content, other students, the instructor, and the technological medium used in the course" (Thurmond, 2003, p. 4). If the interaction is proper, there must be a meaningful engagement of the student with the course content, the course instructors, fellow students and the technology utilised in the online learning activities. Furthermore, the engagement should be reciprocal. The reciprocity aligns with Wagner's (1994, p. 8) definition of interaction as "reciprocal events that require at least two objects and two actions." To this end, there should be mutuality and knowledge or information exchange in interaction in online learning.

Interaction is also viewed by Parker (1999) at the level of the actors, where it is explained as the nature and extent of the students' involvement in the instructional experience. Student involvement entails student engagement in the learning process, which Kahu et al. (2014, p. 523) explain as "a student's emotional, behavioural and cognitive connection to their study." The extent to which the student is engaged in the online learning process invariably impacts student success and achievement (Farrell & Brunton, 2020). It is, therefore, essential to utilise an LMS's online teaching approaches and technological features to fully involve students in the learning process, individually and collectively.

In online interaction, the course instructors could connect with the students through virtual connections (Keaton & Gilbert, 2020). Connections play a critical role in online learning as the students feel connected all the time and are provided adequate Guidance and support as they learn. As noted by Laurillard (2013), support and Guidance result in student engagement, which is marked by interaction, dialogue and feedback between students and course instructors and among students. Such engagement is a critical factor in the achievement of online learning outcomes. Interaction is, therefore, significant for meaningful and rich online learning experiences.

Interaction is considered a vital quality standard when quality-assuring online teaching and learning (Alhih et al., 2017). The preceding statement implies that the course instructor should pay particular attention to interaction at different levels in online course design and implementation. In this regard, interaction becomes a crucial factor in determining the quality of online learning (Laurillard, 2012). Highly interactive online courses yield positive results in the learning process compared to courses where students are alone and feel isolated. Croft et al. (2010) observed that building online learning communities is a crucial way of overcoming student isolation in online learning.

3.3.3 Types of interaction

In this section, the different types of interaction are discussed. The types of interaction include student-content, student-instructor, student-student and student-technology interaction. The first three types of interaction are derived from Moore's (1989) three types of interaction, and the fourth one is an extension of the three.

3.3.3.1 *Student-content interaction*

Interaction in online learning occurs at different levels; hence, there are different types of interaction. Students are expected to interact with content in the online learning environment. The student/content interaction is defined by Moore (1989, p. 2) as "the process of intellectually interacting with the content that results in changes in the student's understanding, the student's perspective, or the cognitive structures of the student's mind." The course content has to be planned and presented so that the students undergo cognitive transformation after engaging with the content. The course content should enrich students. Similarly, Kumar et al. (2021) argue that student-content interaction is pivotal in realising the achievement of the set learning outcomes. As Kumar et al. (2021) noted, electronic content includes content in various multimedia formats such as course readings, multimedia links for demonstration, simulations, discussion forums, case studies, and different types of course assignments. All aspects of the electronic course content are meant to promote learning.

3.3.3.2 Student-instructor interaction

According to Keaton and Gilbert (2020, p.140), student-instructor interactions are any form or type of communication or engagement between the student and the course instructor to assist the student in the online learning process. Such communication and engagement help the student navigate through the course content in a structured way. Kim et al. (2015) noted that student-instructor interactions may take the form of synchronous or asynchronous means and assist in motivating the online student to persist with studies. It is essential for online students to feel connected to the course and the course instructor to reduce or eliminate feelings of isolation, which are detrimental to learning. The issue of isolation is a risk factor for student engagement and academic success (Kotera et al., 2021). In the planning and implementation of online courses, there is a need for course instructors to ensure the maintenance and sustenance of connection with the students.

As noted by Hunter and Ross (2019), there is a correlation between online students' academic achievement and the nature and extent of student-instructor interaction. There is an observation by Jagers and Xu (2016) that in instances where interaction between the student and course instructor is frequent and practical, the students are encouraged to perform at a higher level. Therefore, the students should feel the instructor's presence in an online course through continuous Guidance and support in the learning process. The course instructor should be trained in online pedagogies to select and utilise different approaches and techniques for interacting with the students in virtual spaces. It is also important to note that one quality indicator in online learning is student satisfaction. The quality of student-instructor interaction directly results in enhanced student satisfaction with online courses (Watts, 2016). Suppose online students are to show high levels of satisfaction with online courses, as shown in surveys that may be carried out. In that case, this will indicate the quality of student-instructor interaction.

The students and the course instructor should interact in ways that promote critical thinking in the students (Archila et al., 2022). Through student-instructor interactions, online learning should utilise varied active learning strategies that involve students in thought-provoking activities that allow them to be debaters, problem-solvers, critical thinkers, decision-makers, and self-directed students (Zhu & Liu, 2020). The course

instructor should plan for such activities at the course design level such that when the course is offered online, there are opportunities for the students and course instructors to interact in ways that promote higher-level learning outcomes. The course instructor should be able to provide students with the opportunities “to collaborate, construct, experiment, interact, and reflect, but also to think about what and why they are doing this” (Archila et al., 2022, p. 3). From the preceding viewpoint, there are profound pedagogical implications for online teaching and learning, as the course instructor's ability to stimulate and sustain intellectual curiosity in students is critical.

The quality of student-instructor interaction is also linked to the high chances of the students' completion of online courses (Budash & Shaw, 2017; Ley & Gannon-Cook, 2014). The issue of high attrition and low completion rates in online courses is well-documented in the literature (Bawa, 2016; Boton & Gregory, 2015; Waugh & Su-Searle, 2014). The quality of any educational programme is measured against the completion rates. Online courses must minimise dropout rates and increase completion rates, hence the importance of enhancing the quality of student-instructor interaction in online courses. One way of enhancing student-instructor interaction is how the instructor participates in and guides online discussion as an online learning tool. To this end, Van den Berg (2012) notes that course instructors should possess the requisite skills to manage online discussions for effective learning.

3.3.3.3 Student-student interaction

Student-student interaction brings an important social element to online learning, and as explained by Keaton and Gilbert (2020), this type of interaction permits the students to see their fellow students and course instructors as real people and not be able to see others as “human” in an online environment can be a negative consequence of online learning. However, when done correctly, social interaction can minimise feelings of disconnection and isolation, which may negatively affect online learning and persistence. As further noted by Phirangee (2016), student-to-student interaction assists in enabling students learning in an online environment to feel connected.

According to Phirangee (2016), student-student interaction is vital in building and operationalising online learning communities. Online learning communities are student groups meant to promote collaborative learning through focused discourse and

reflection, resulting in a shared understanding of the different aspects of the course material (Gao et al., 2013). Establishing online learning communities allows students to participate in a community with a sense of belonging. Such participation enhances the learning process and ultimate attainment of the set learning outcomes. The present study sought to establish the nature and extent of distance education students' participation in established learning communities by understanding their experiences of such participation.

As further noted by Phirangee (2016), student-student interaction in an online learning community is necessary to allow students to work with fellow students. This involves students freely participating in online group activities, providing their ideas and challenging other people's ideas, as well as sharing ideas and drawing from the diverse opinions of others. Student-to-student interaction also occurs between individual students, between small groups of students, or among the students in the course (Allred, 2016). Different aspects of the LMS, such as discussion boards, can enhance student-student interaction synchronously or asynchronously.

In student-student interaction, there is purposeful interpersonal interaction in online learning (Mehall, 2020). As further noted by Mehall (2020), purposeful interpersonal interaction involves the student's interaction with online instruction, interaction with other students for social purposes, and supportive interaction. Purposeful interpersonal interaction is explained in terms of the quality of communication and engagements between and among online students for enhanced learning. Furthermore, purposeful interpersonal interaction is significant for attaining online learning outcomes. The building of quality social relationships is also essential in successful online learning. Of importance in purposeful interpersonal interaction worth pursuing in the present study is the aspect of supportive interaction, as it is crucial to establish how students support each other in online learning.

3.3.3.4 Student-technology interaction

One of the essential types of interaction is the students' interaction with technology. Teaching and learning online are mediated by technology, and the students' interaction with technology significantly impacts online learning. As observed by Danesh et al. (2015), the technology utilised for online learning may be new to the

students, and they require some time to interact with the technology to master a certain degree of competence in its use. Furthermore, time and effort spent learning the technology may affect the interaction with course instructors, fellow students and the content. The importance of student-technology interaction is supported by Van den Berg (2020), who states that since learning in an online environment is mediated by technology, there is a need to consider the student's interaction with technology as a significant aspect of learning in virtual spaces.

Regarding students' interaction with technology, access to the technology utilised in online teaching and learning may be challenging. In all parts of the world, students have unequal access to technological devices and the Internet, which are prerequisites for online learning (Ong, 2020). This unequal access results from the digital divide, where students from higher socioeconomic classes have access while those from lower society remain disadvantaged. Such a scenario is against the principle of social justice in education, which calls for equal access to education. Similarly, Patel et al. (2017) note that e-learning is a challenge for most students from poor backgrounds in historically disadvantaged South African universities without the availability of the required technological devices. In the present study in a rural-based university, access to technological devices and data becomes an essential factor influencing interaction.

Key in the students' interaction with technology is digital competence as opposed to mere digital literacy (Borthwick & Hansen, 2017). While digital literacy entails the ability to use digital tools, resources and services correctly, digital competence is at a higher level, and it is more than the ability to use devices and applications (Janssen et al., 2013). According to the European Commission (2007), digital competence involves a combination of knowledge, skills and attitudes towards utilising technology in a manner appropriate to the context. It is essential for students and course instructors to operate at an expected level of digital competence to benefit fully from the different digital technologies available for online teaching and learning.

Online students may need to be trained and supported on technology for effective online learning. As Roddy et al. (2017) noted, online students may need more technological skills to be utilised for online learning, and this lack may negatively impact their practical learning and attainment of the set learning outcomes. It becomes

imperative for institutions offering online courses to deliberately plan and implement ways of training and supporting online students. Similarly, Aluko (2021) notes the importance of providing different ways of supporting students, including using call centres, which the students can utilise for technology troubleshooting whenever they encounter challenges. In the present study, the researcher sought to establish the nature and extent of student support for online learning.

Online learning utilises digital learning technologies, which come at a cost to students. Students are expected to interact with technology that they may need help to afford. As noted by Dhawan (2020), there is no digital equity in most countries, and some educators and students may need the appropriate devices for online teaching and learning and the required internet connectivity. With the required devices and internet connectivity, some students may be able to participate in online learning fully and, in the process, gain out on learning opportunities. In the South African context, Letseka et al. (2018) observe the socioeconomic challenges of most black communities and how these negatively affect their participation in e-learning.

The practical implementation of online learning is negatively affected by the digital divide. In most developing countries, there is unequal access to ICTs between the rich and the poor social classes (Venkatesh & Sykes, 2013). The differences extend to the actual use of digital devices, with students from lower socioeconomic classes requiring more training and support in using digital technologies for learning. The online students' ability to utilise the LMS as independent students results in how they derive the maximum benefits from online learning (Bradley, 2021). The students should, therefore, be trained and supported in using all the technology used in mediating learning, as failure to navigate the technology predisposes students to poor or limited participation in online learning.

3.3.4 Interaction and student satisfaction

Ensuring that the students are satisfied with online learning experiences is essential. As defined by Moore (2011), student satisfaction is when the students succeed in online learning and have excellent and enjoyable online learning experiences. Bollinger and Erichsen (2013) argue that online students invest time, finances and effort as they engage in online learning. They should get value for their investment by

being involved in worthwhile learning opportunities. The present study sought to establish the distance students' experiences of online learning, and the issue of student satisfaction was sought in analysing their experiences.

The issue of student satisfaction is directly linked to the students' completion rates of online courses (Turley & Graham, 2019). Open distance learning, in general, and online learning are associated with low completion rates and high dropout rates (Boton & Gregory, 2015). While numerous factors contribute to online students dropping out of courses, the issues of perceived lack of satisfaction and negative online learning experiences are some of the factors. When students feel isolated and lack some support, they often eventually opt out of online learning programmes. It is, therefore, imperative to plan for and implement high-quality interaction in online learning to enhance the online learning experiences of the students.

The nature and extent of interaction in online learning impact student satisfaction with online courses (Fatma & Mustafa, 2016). In a study that sought to establish the relationship between interaction and online learning satisfaction in online courses, She et al. (2021) found a strong relationship between the two and that students exposed to highly interactive and engaging online environments were satisfied with their online learning experiences. Similarly, Alqurashi (2018) underscores student satisfaction as an essential indicator of the success of an online course. Furthermore, the issue of student satisfaction with online learning is also related to completion and dropout rates in online courses (Kim & Kim, 2021).

3.3.5 Interaction and transactional distance

Interaction should promote the reduction of transactional distance. According to Moore (1997), transactional distance involves structure, dialogue and autonomy. The structure involves aspects regarding the course design such as learning outcomes, teaching and learning activities, learning materials, and assessments as planned by the course instructor, whilst dialogue is how communication is carried out in the learning process, and autonomy is how the students are provided with opportunities to control and manage their learning. It has elements of self-directed learning (Moore, 1997).

Transactional distance increases when the students feel disconnected from the course instructor and peers, hence the importance of enhancing dialogue. As Quong et al. (2018) noted, how course instructors and students communicate in virtual learning spaces may need more human-like aspects, and students may feel disconnected in the online learning environment. There is a need to ensure that the course instructors' virtual visibility is maintained through constant communication with the students. The students should also communicate with the course instructor and fellow students to enhance teaching and learning to reduce transactional distance.

The course instructor may use social networks to foster students' engagement, interaction, and social presence to reduce transactional distance in online learning environments (Quong et al., 2018). In a study on ascertaining the role of social media in fostering collaborative learning, Ansari and Khan (2020) found that using different elements of social media was very impactful in promoting interactivity between course instructors and students and among students. Social media also influenced knowledge sharing as students and course instructors could easily share content in different multimedia formats. Social media and mobile devices were affordable and convenient tools for obtaining and sharing information. In the context of the present study, it was considered worthy to establish ways the course instructors utilised to promote interaction in online learning.

Another way of using social media to promote collaborative learning and reduce transactional distance is to provide opportunities for online students to create, edit and share the course contents in textual, video or audio forms (Nasir & Khan, 2018). Such an approach allows the students to be actively involved in knowledge co-construction using technologies available and shared through social media. Online students cease to be passive consumers of course content but are actively involved in the learning process with the Guidance of the course instructor. The way the online students were involved in collaborative knowledge construction and sharing was an important focus point in the present study.

3.3.6 Interaction and student success

Studies have shown the relationship between interaction and student success in online learning. There are varied meanings of student or student success, as it may mean

student satisfaction with a course, achievement of good grades or completion of a programme of study (Alyahyan & Dustegor, 2020). In the context of the present study, student success is multidimensional. It includes academic achievement, achievement of the set learning outcomes, acquisition of the required knowledge, skills and competencies, satisfaction, and persistence (Arulkadacham et al., 2021). In a study on predictive factors of student success in online learning, Kauffman (2015) concludes that many factors influence student success, such as instructional methods, support, course structure and design. Such factors influence student satisfaction and, invariably, student success. Whilst interaction in online courses is essential, it is not the sole or significant determinant for student success.

Students' success in online courses should be understood from the perspective of critical indicators of effective online learning (Arulkadacham et al., 2021). Arulkadacham et al. (2021) further noted that understanding indicators allows course instructors to plan and implement discipline-specific strategies to design courses and support students for success in online learning. It is clear from the preceding observation that there is a need for a holistic approach to understanding student success in online courses. The issue of interaction, therefore, should be considered together with other course design and course delivery factors.

It has been established that students exposed to highly interactive activities form a solid support base necessary for persistence (Mohamedhoesein & Crul, 2018). Of importance in the preceding observation is the realisation that online learning could be a lonely experience when there is no adequate socialisation and support, hence the need to provide students with opportunities to work with others. Loneliness is explained by Savci et al. (2022) as the lack of social interaction that the individual may require. Students in an online learning environment require care and support as they interact with others. On the issue of loneliness, Stoliker and Lafreniere (2015) note that it results in learning burnout, which hurts learning ability and achievement. One must emphasise the need for a support group that provides the online student a platform to work collaboratively with others.

As Kotera et al. (2021) observed, loneliness is a bad state of psychological well-being, resulting in challenges in one's social network. Loneliness is a risk factor for poor academic performance, poor engagement with course content and success (Lin &

Huang, 2012). The observation that loneliness is a risk factor for student success makes it mandatory for course instructors to incorporate very high levels of social presence and socialisation in online courses. There should be numerous teaching and learning techniques that promote students' interaction with their peers in building effective online learning communities for enhanced learning. In the online learning communities, the students should utilise the digital space to actively engage each other in collaborative and student-centred learning activities (Andrews-Todd & Rapp, 2015). In the next section, the benefits of online interaction are discussed.

3.4 BENEFITS OF INTERACTION IN ONLINE LEARNING

Research has revealed numerous benefits of interaction in online learning. In this section, the benefits such as learning from other students, working together with others in performing online tasks, mutual support in learning, the support provided by the course instructor, effective utilisation of the LMS and its functions, effective utilisation of the electronic device and its functions, Guidance on aspects of the course content, obtaining course expectations from the course instructor, obtaining assessment expectations from the course instructor as well as the receiving assessment feedback are explored.

3.4.1 Learning from other students

Online students can learn from their fellow students through interaction with other students online. The team-based approaches to learning in the virtual learning environment provide students with opportunities to co-construct knowledge (Wu et al., 2022). While working collaboratively to construct knowledge, students exchange ideas and learn from one another. In the case of distance education students, there is richness in their diversity as they hail from different backgrounds and carry crucial cultural capital, which they share for enhanced learning experiences.

Using well-planned and online-supported group discussions allows the students to learn from one another through collaborative discourse (De Wever & Strijbos, 2021). Students are given opportunities to present different viewpoints on a topic, and as they make individual contributions, they learn from each other. Through online discussion, students learn from each other by exchanging knowledge and insights from their experiences (Mtshali et al., 2020). Interaction through online discussion becomes an

essential way of promoting deeper learning and has profound pedagogical implications on how the approach is utilised to enhance online learning. It would be essential to establish how students reflect on their online learning experiences by ascertaining how they learnt from each other.

3.4.2 Working with others in performing online tasks

Interaction in online learning allows students to work together in performing online tasks. Students working online may be tasked to work in teams, and the team-based approaches ensure that the students work collaboratively to acquire or construct new knowledge (Ficapal-Cusía & Boada-Grau, 2015). Team-based approaches in virtual learning foster in students the much-needed graduate attribute of teamwork. A student should be able to work in a team to further team goals. Providing opportunities for online students to undertake collaborative online tasks is essential to effective online teaching and learning. In the context of the present study, it was worthy to establish how distance education students experience collaborative learning online.

Working in teams promotes active learning in which the students take control of their learning (Ficapal-Cusía & Boada-Grau, 2015). Learning approaches in higher education should be more student-centred. Student-centred learning has immense benefits, such as promoting critical thinking, problem-solving and active citizenship skills (Gover et al., 2019). As further noted by the same authors, the three attributes mentioned are necessary to prepare students for work and life as responsible citizens. Student-centred learning is also vital in achieving the United Nations' Sustainable Development (SDG) Goal Number 4, which aims to; "*Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all*".

3.4.3 Mutual support in learning

Interaction allows students to support each other mutually as they work online, essential for enhanced engagement and satisfaction (Berry, 2019). Through community-building and involvement in online community activities, the students develop closeness to a community, and there is mutual support in the learning process. Maintaining close connections through peer interaction offers the much-needed academic support necessary for the online student's persistence (Athens, 2018). It has been observed that the online student may quickly stay in a programme

or course with peer support and other forms of online support, such as academic support. Building and sustaining online learning communities for mutual academic support becomes critical.

In a related study on establishing the strategies helpful in the promotion of engaged learning in an online introductory nutrition course, Banna et al. (2015) found that through interaction with fellow students in synchronous sessions as well as social media, students were able to derive benefits from the support from other students. Similarly, Self et al. (2018) note that with adequate support from each other, online students are engaged in learning and improve their chances of success. The critical observation is the relationship between one's level of engagement and its influence on success; online students should, therefore, work in mutually supportive ways to enhance their online learning experiences and success.

3.4.4 Support provided by the course instructor

The benefits of interaction in online learning are also evident in the nature and support provided by the course instructor. As the course instructor facilitates discourse in online learning, the online students feel guided to stay focused on their learning (Watson et al., 2017). Online students should feel the instructor's presence through instructions provided to regulate discussion and comments and feedback on their attempts. The way the course instructor facilitates discourse in online learning is an essential aspect of virtual interaction, directly affecting student persistence and performance. Online students who feel supported tend to persist with the online course and invariably perform well (Costley & Lange, 2016).

Online students feel supported by the course instructor through well-planned and well-executed aspects of direct instruction. In such aspects of direct instruction, the course instructor provides direct intervention in correcting the areas where the students may go wrong, providing sources and information and showing examples of the correct ways of undertaking tasks and solving problems (Swan et al., 2009). Of importance in the preceding viewpoint is the realisation that the course instructor should show a heavy instructor presence as students derive maximum benefits from virtual interaction with the instructors through clear Guidance and support.

3.4.5 Effective utilisation of the LMS and its functions

Teaching and learning online utilises a carefully selected and defined LMS. A standard LMS enables the course instructor to plan and deliver course content, learning activities, and assessment processes (Bradley, 2021). The LMS contains features that allow online collaborative groupings, online discussion and enhanced synchronous and asynchronous communication (Quinn & Gray, 2020). Therefore, students learning online derive maximum benefits by effectively using the features and functions of an LMS for enhanced learning. As further noted by Bradley (2021), as the students interact with the LMS, they can utilise the different features of an LMS, and they may be involved in inquiry-based learning, which promotes deeper learning and improves their online learning experiences.

Another benefit that the students derive from their interactions with the LMS is the development of autonomy and independence in online learning (Alkhasawneh & Alqahtani, 2019). The students must be autonomous and independent as they learn online because they can search for information independently and engage in the set learning activities. In the process, online students develop essential life-long skills by learning how to learn. The ability to learn how to learn is an essential skill that will assist students to learn throughout their academic careers. The students will not rely on a course instructor to learn but can learn independently. In the context of the present study, it was deemed proper to establish how the students derived benefits from their interaction with the Moodle LMS in the university under study.

A learning management system also contains features that enable students to monitor their progress (You, 2016). The monitoring of one's progress is a crucial component of independent learning. However, students must be trained and supported in utilising the LMS to derive maximum benefits, such as monitoring their progress. Once the students can identify and use the appropriate features of an LMS to monitor their progress, they will develop essential skills such as being independent students (You, 2016). It was also considered helpful in the present study to establish the benefits the students derived from the different functions and features of the Moodle LMS. This was an essential aspect of interaction with technology, which is necessary for improved online learning experiences.

3.4.6 Effective utilisation of the electronic device and its functions

In another aspect of interaction with technology, the student learning online should derive maximum benefits from the effective utilisation of electronic devices used for online learning (Limniou, 2021). In instances where the students cannot use the different functions of the electronic device, such as a mobile phone, tablet or laptop, they may need to interact better with the electronic device and derive maximum benefits from the interaction. The preceding observation has severe implications for the nature and extent of student support in using electronic devices for online learning. This also points to the need for purposely developed policies on electronic device usage for online learning.

In the students' interaction with technology through the effective utilisation of electronic devices for learning, technology should not be a distraction in the learning process (May & Elder, 2018). If technology becomes a source of distraction, the whole teaching and learning process is negatively affected. The students' interaction with technology becomes a considerable challenge. Students should, therefore, be taught how to effectively utilise technological devices for academic and social purposes without compromising the quality of the online learning processes through distraction. In the context of the present study, it was also essential to ascertain, from the participants' experience, how they utilised technology for online learning with minimal distraction.

Online students' effective utilisation of technology results in seamless learning (Sung et al., 2016). In seamless learning, the students enjoy the flexibility of learning from one learning model to another in different scenarios and utilising multimedia content. To this end, online learning students should enjoy rich learning experiences, which is only possible when they can fully utilise the functions and features of electronic devices. Students should be trained and supported in understanding the technology utilised for online teaching and learning to derive maximum benefits from the interaction with technology. With deliberate training and support, it will be easier for the students learning online to use electronic devices effectively.

3.4.7 Guidance on aspects of the course content

One of the fundamental roles of the course instructor in online teaching and learning is guiding content delivery (Lee, 2020). As the online student engages with the content

and learning activities, there is a need for clear instructions and Guidance. When the student encounters challenges in understanding the course content, there should be virtual support from the instructor to provide the needed Guidance. The students should have ways of communicating the difficulties online and receiving the necessary Guidance. This interaction makes it possible for online students to progress with their studies. According to Kumar and Kumar (2020), the continuous interaction between course instructors and students is essential for student retention in online courses.

As the students engage in different learning activities in an online course, there should be interaction with the course instructor through instructions and a clear explanation of the content (White et al., 2018). The course instructor should structure and present the content pedagogically soundly so that the students can interact with the content and understand and apply the concepts learnt. The course instructor may also present content in smaller segments, known as chunking (Humphries & Clark, 2021). The content presentation in chunks allows students to engage in manageable units, which assists with retention. The course instructor, therefore, interacts with online students through how the course content is presented, guiding the students.

The course instructor is expected to guide the students in engaging in fruitful and meaningful online discussions (Seethamraju, 2014). Adequate Guidance in online discussion assists the students in improving their critical thinking and problem-solving skills, decision-making ability, written communication skills, and the ability to organise and analyse information (Seethamraju, 2014). Students should be able to engage with each other online with Guidance and support from the course instructor.

3.4.8 Obtaining course expectations from the course instructor

The students learning online can interact virtually with the course instructor and benefit from obtaining clear course expectations. The course instructor needs to communicate well with the students learning online, and this communication is a crucial aspect of the teaching presence, which helps to motivate and inspire the students (Florescu & Pop-Pacurar, 2016). In a related study on what students considered as present in an online classroom, Hajibayova (2017) viewed the communication of course expectations and sustained communication throughout the course duration as essential aspects of teaching presence in an online course. It is imperative for the

students to feel the Guidance provided by the course instructor through clear instructions and explanations of concepts.

It has been noted that it is beneficial to the students learning online that all the course expectations are clarified from the onset of the online course (Hajibayova, 2017). When the students are clear about what is expected of them in the course and the specific learning and assessment activities, they become motivated to persist. Furthermore, clarifying course expectations enhances the students' intrinsic motivation and a sense of control of the course as they become inspired to learn (Kebritchi et al., 2017). It was also deemed necessary in the present study to establish how the students learning online experienced the different facets of teaching presence. The nature and extent of teaching presence through clear communication of course expectations are critical elements of online learning.

In virtually interacting with the course instructor, the students learning online derive maximum benefits from close and frequent interactions with the course instructor (Kebritchi et al., 2017). Therefore, the course instructor must be 'visible' in the virtual learning platform to provide continuous Guidance to the students. The preceding view is consistent with Garrison's (2011) assertion that online learning facilitation entails continuous monitoring and providing comments and feedback on the students' work in a way that maintains and sustains their interest, motivation, and engagement in the course. The students are motivated to persist with the course when they feel supported by the instructor.

3.4.9 Obtaining assessment expectations from the course instructor

The assessment expectation should be clarified to the students from the onset to align the assessment with the teaching and learning activities in an online course (Huss & Eastep, 2015). Similarly, Koenen et al. (2015) note that what the course instructor plans to do with the students in terms of the teaching and learning activities should be aimed at achieving the set learning outcomes. To this end, all the assessment activities should align with the learning outcomes and activities. The nature of assessment activities, how they will be carried out and for what purpose should all be made clear to the students studying online, and nothing should surprise them.

In the online course design process, there should be a deliberate attempt to closely link learning outcomes and teaching and assessment strategies (Sylvestre & Maitre, 2018). The preceding view ties nicely with the classical view by Biggs (2014) that underscores the importance of constructive alignment in teaching, which entails aligning teaching methods and assessment so that all aspects of teaching support student learning. In the process of constructive alignment is the desire to inform students of the assessment processes in the online course.

In further underscoring the importance of constructive alignment, Biggs (2014) states that what is intended to be taught to students and how it would be ascertained that they have learnt should be stated and clarified to the students before teaching and learning occurs. It is, therefore, essential to inform students of the assessment expectations before an assessment is conducted. As the students interact virtually with the course instructor, they should benefit from receiving information about the assessment expectations in an online course. The information prepares and guides students to achieve the learning outcomes.

3.4.10 Receiving assessment feedback

Assessment, especially formative assessment, is a critical aspect of online learning. As Chung et al. (2006) noted, formative assessment is critical as it involves course activities and tasks to provide the student with important information about learning progress. The student's feedback in the learning process is pivotal in achieving the set learning outcomes.

It has been noted that the nature and extent of feedback in the learning process provide the course instructors with opportunities to engage their students in self-directed learning (Atkinson & Lim, 2013). The online students are guided in the learning process through timely and detailed feedback. The LMS may be utilised to provide automated responses that provide students with valuable, immediate feedback necessary for progress in learning. As Beebe et al. (2010) noted in a virtual learning environment, learning and assessment are not separate phases as both directly influence student learning. Students learn more from feedback from formative assessments as they can identify their strengths and weaknesses, build on them, and address their weaknesses.

Formative assessment, also known as assessment for learning, is pivotal in enabling students to learn through effective feedback. While working with the feedback, they fully understand their learning and the goals they aim to achieve (Beebe et al., 2010). There is, therefore, a need for course instructors to provide quality and detailed feedback to online students. The students utilise the feedback provided by the course instructor to improve their learning, hence the importance of addressing feedback in online learning environments. In the next section, the researcher reviews the literature on student training and support for interaction in online learning.

3.5 STUDENT TRAINING AND SUPPORT FOR INTERACTION IN ONLINE LEARNING

The students taking online courses would require training and support to derive the maximum benefits of interaction in online learning. This section reviews the literature on different aspects of training and support for interaction in online learning, including training and support for general LMS usage, interactive features of the LMS, plug-in features of the LMS, and social media usage for learning, among others.

3.5.1 Training and support in the general use of the LMS

Learning online utilises an LMS. The LMS provides the course instructors and students with an online classroom where all the teaching and learning processes occur (Bradley, 2021). Unlike the traditional classroom, where the students would access some physical space and engage with the lecturer, the virtual interface utilises technology, and students should be able to navigate the virtual learning environment. Using the LMS, the students can access course content in various multimedia formats (Jung & Huh, 2019). The students should have the knowledge and skills to navigate the LMS to access the course content. In underscoring the importance of e-learning technological training and support for students, Maphosa and Bhebhe (2019) indicate that the students' digital literacy skills should be enhanced to benefit from e-learning.

Digital literacy entails the student's ability to navigate the digital learning platform so that there is active involvement in learning (Brodie, 2018). The student should be able to utilise the LMS by performing essential functions such as logging onto the LMS and downloading and uploading material. Without the essential ability to work on the LMS, online learning becomes a considerable challenge for the student. The digital divide

must be addressed as students learn online, as there are students who possess technical skills and those who do not (Cloete, 2015). Institutions should be able to identify students who need more technological skills to train and support them so they can meaningfully participate in online learning without being left behind.

Through the LMS, the course instructor and the students can communicate and share learning materials, and the students can also submit assignments and take some tests (De Oliveira et al., 2016). An LMS is, therefore, software that the course instructors utilise to plan, implement and evaluate learning. If the student is to derive maximum benefits from online learning, there is a need for deliberate training and support for students on using the LMS. Interaction with technology becomes the most fundamental and significant form of interaction as it is the basis for other forms of interaction.

3.5.2 Training and support in the use of interactive features of the LMS

An LMS is a digital learning platform that allows online students to be involved in the co-construction of knowledge (Chang & Kuo, 2021). The co-construction of knowledge is essential in empowering students to be independent and take charge of their online learning by working with others to create and share knowledge. People view an LMS as a boundary object differently in different settings (Chang & Kuo, 2021). Therefore, there is a need to consider the socio-cultural differences of the LMS users and train and support the students to utilise the LMS effectively features for co-construction and shuttering of knowledge.

An LMS also provides students with online interactive features such as threaded discussions (Mtshali et al., 2020). Through participation in an online discussion forum, the students utilise computer-mediated communication using a web-based application to bring people with a shared interest together to explore ideas from different viewpoints (Mtshali et al., 2020). Online discussion forums also provide opportunities for social interaction and teamwork as students may interact and exchange ideas asynchronously, with a degree of flexibility and convenience (Alzahrani, 2017). However, enhanced learning training and support should be provided for students to participate meaningfully in online discussions. Such training assists the students to

contribute meaningfully to discussion and responding to others in mutually beneficial ways.

In online discussion forums, students are involved in deeper learning by mentally engaging in learning through deep thinking and interactive activities (Salter & Conneely (2015). A student must read widely before making a meaningful post to the discussion forum. A student is also expected to read other students' posts and respond through insightful comments or questions. Such a learning approach is not only interactive but active and engaging. Through online discussion, students and lecturers should be able to interact and share knowledge through digital technologies, hence the need to adequately train and support students to develop the required digital literacy (Salter & Conneely, 2015).

3.5.3 Training and support in interactive plug-in features such as an Interactive whiteboard or Jamboard

An LMS works with add-on or plug-in tools from external sources, such as the virtual interactive whiteboard, Google Jamboard or Miro board. The tools foster active and cooperative learning strategies for engaging students in the classroom and improving learning (García-Almeida & Cabrera-Nuez, 2020; Montrezor, 2021). The virtual interactive whiteboard, Google Jamboard or Miro Board allows students to organise information in meaningful ways and explain and share it with others in the virtual learning space. The students are also able to work collaboratively with others online. However, students require training and support to use the add-on or plug-in features of the LMS.

A Jamboard is a web-based whiteboard system that allows real-time co-authoring using a browser on any laptop, tablet or smartphone (Sweeney et al., 2021). A new Jamboard can be created and shared with students, or a link to the Jamboard may be shared with students to access it on the Jamboard; up to fifty students may work collaboratively and simultaneously, creating different slides or working on a single slide time (Sweeney et al., 2021). Collaborative learning is heightened as many participants may edit the same or different slides simultaneously (Sweeney et al., 2021). The course instructor may mark or comment on students' work, providing real-time feedback. Training and support enable students to make effective use of the Jamboard.

The Jamboard is an effective online collaborative tool for teaching and learning as it allows students to be engaged with their peers in an online class (García-Almeida & Cabrera-Nuez, 2020). The students use the tool to work together and share knowledge, as they can work together on one document simultaneously or at different times. The course instructor should explain clearly how Jamboard works and how students can practically work on it to create and share knowledge. To this end, deliberate training and support programmes are required to develop the students' capacity and enhance their online learning experience. An online learning tool is only helpful if the students can utilise it fully.

3.5.4 Training and support in the use of social media for learning

Using the different social media platforms for learning is vital in promoting collaborative learning. Social media is defined as 'a group of Internet-based applications that build on the ideological and technological foundations of Web 2.0, and that allow the creation and exchange of user-generated content' (Kaplan & Haenlein, 2010, p. 59). Examples of the most popular social media platforms are Facebook and WhatsApp, as they allow users to create and share content in different multimedia formats and using WhatsApp groups, learning is supported by sustaining learning communities that alleviate students' loneliness and isolation (Van den Berg & Mudau, 2022). Wickramanayake and Muhammad (2018) noted that content shared through social media platforms could be in ordinary text, videos, audio or pictures. The implication of content creation and sharing through social media is that the students should be able to create and share content, hence the need for deliberate training and support. Students may be able to use social media for other non-academic purposes, and the use of the same for educational purposes requires some training.

The importance of utilising social media in the online teaching and learning environment is to foster collaboration through enhanced interaction and communication (Wickramanayake & Muhammad, 2018). Through active participation in social media learning activities through Facebook and WhatsApp, the students engage in active and self-directed learning where they collaborate with others in the learning process. As Neier and Zaye (2015) noted, students may combine formal and informal learning approaches that enhance their online learning experiences through participation and interaction with others in social media activities. In the context of the

present study, it was considered necessary to establish how the students were trained and supported using social media for interaction.

In a related study that surveyed the students' views on using social media in the learning environment, Wickramanayake and Muhammad (2018) found that the respondents in the study were generally agreeable that social media assisted them in improving their critical thinking and problem-solving skills. This shows that social media is a powerful tool for deeper learning if incorporated into learning in pedagogically sound ways. There are views that social media may be a source of distraction, which may negatively affect the students' learning (Lim et al., 2014). The possibility of social media as a distraction makes it imperative for institutions to train students on the responsible use of social media platforms for learning.

3.5.5 Training and support in the use of Open Educational Resources

Students' interaction with content is an essential aspect of interaction in online learning. Open educational resources (OER) are defined as "teaching, learning, and research resources that reside in the public domain or have been released under an intellectual property license that permits their free use and repurposing by others" (Hewlett, 2017, p. 1). Content may be available in OER available online. OER have grown in popularity because they have allowed internet users to access learning material without any hindrances or costs (Christoforidou & Georgiadou, 2022). Hewlett (2017) states that OER are different learning materials, such as lecture material, reference books and readings, simulations, experiments and demonstrations, syllabi, curricula and teachers' guides. Many learning materials are readily available online, and students should be taught information literacy skills to search and select appropriate OER for educational purposes. The proper use of OER is critical in the students' interaction with content.

Innovative and meaningful online courses should be OER-based, which means that in the online course, students and course instructors should be able to use OER extensively (Sandanayake, 2019). In designing the courses, the course instructors should use and refer students to different OERs to enjoy the liberty of using copyright-free materials for academic work (Clements & Pawlowski, 2012). As further noted by Sandanayake (2019), OER assists students, especially in developing countries where

there may be challenges in accessing relevant materials, as such materials are available at the "free and open" concept. However, for students to benefit from interaction with content through OER, training them on the proper and ethical use of the resources is necessary.

OER ensures that students studying online courses access different learning materials, richer and more valuable than printed text (Christoforidou & Georgiadou, 2022). The meaningful utilisation of OER in different multimedia formats is underpinned by the student's ability to select such sources and use them appropriately for academic purposes. In the training of students in the use of OER, there is a need to provide awareness of the different online information databases and repositories containing OERs, how to identify OERs and make proper use of them in learning. As further noted by Christoforidou and Georgiadou (2022), institutions may also develop frameworks or policies for OER usage apart from training students. Such frameworks or policies would assist students in OER usage.

In a related study on students' awareness and use of OER, Christoforidou and Georgiadou (2022) found that some students had challenges in locating OER in appropriate repositories, and the use of OER was limited to the type they could easily access online. The preceding observation has severe implications for training and support for students in OER usage.

3.5.6 Support for online technical challenges

Distance education students may encounter technical challenges as they work online. There is always a need to support students in troubleshooting technical challenges. The nature of challenges faced by open and distance e-learning (ODEL) are different from those faced by students in the older generations of distance education students, as the current students face challenges related to new communication tools and how to utilise the technologies for learning (Rotar, 2022). Institutions should implement programmes to train and support course instructors (Nawaz & Khan, 2012).

There are growing calls for open and distance e-learning institutions to operate with fully functional call centres that can offer students all forms of support on-demand, including technical support (Kondra et al., 2011). In instances where call centres are fully operational, online students always have a way of seeking and receiving support

whenever they encounter technical glitches as they work online. It is frustrating for a student to encounter technical challenges and fail to get assistance, as this negatively impacts learning progress, resulting in feelings of isolation and neglect. Issues of isolation and lack of support for distance students have been identified as causes of student attrition in online courses (Su & Waugh, 2018).

3.5.7 Support for online learning community activities

Students working online also require support in understanding an online learning community and how to participate in online community activities for enhanced learning. Students who belong to an online learning community are bound to be engaged in learning and, invariably, derive satisfaction from online learning experiences (Berry, 2019). Similarly, students with a sense of community derive immense academic benefits such as enhanced classroom participation and deep learning (Garrison et al., 2001). The course instructors should assist students by supporting them to participate in online learning communities by providing opportunities to interact with peers with a deep sense of connection (Koslow & Pina, 2015). Berry (2019) noted that course instructors should invest in strategies that connect students in virtual learning spaces when teaching online.

Research has indicated that students who participate in online learning community activities remain motivated to learn as they feel the support of others (Hilliard & Stewart, 2019). Furthermore, in collaborative community activities, students are assisted to engage with course content through group or team-based tasks. As they work collaboratively online, they develop a sense of cooperation, shared responsibility, and rewarding online learning experiences (Fiock, 2020). Given the importance of online learning communities, it is imperative for course instructors to provide students with the required support to participate in online community activities to enhance their online learning experiences.

The course instructors may use deliberately developed tutorial guidelines on how students should participate in online learning communities by spelling out roles, responsibilities and forms of acceptable behaviour and netiquette (Fiock, 2020). Once the roles, responsibilities and expected codes of behaviour are indicated, participation in online community activities becomes easy for students as they will be guided by

clear expectations (Fiock, 2020). Through the expectations, students become aware that participating in online learning communities is a course requirement for mutual benefit.

In this section, a literature review focussed on student training and support for interaction in online learning. The following section discusses the literature on factors promoting or hindering interaction in online learning.

3.6 FACTORS PROMOTING OR HINDERING INTERACTION IN ONLINE LEARNING

Some factors may promote or hinder online students' interaction in online learning. In this section, the researcher discusses the factors, intending to build on the positive factors and ameliorate the deficiencies. Some factors discussed include course instructor online support, course content, students' willingness to work with other students, collaborative learning opportunities, and Internet connectivity.

3.6.1 Course instructor online support

The instructor should be present in an online course, and the presence should be evidenced by actively and visibly engaging with students in the teaching and learning process (Richardson et al., 2016). A course instructor who is 'visible' in the virtual learning environment influences the students' participation in learning through virtual interactions. The course instructor's availability for support and 'visibility', also known as instructor presence, is evident in how the learning role is facilitated online (Lee, 2020). Students learning online require constant support from the course instructors, and the course instructor should be aware of multiple supportive roles to be played (Lee, 2020). As a facilitator, the course instructor should guide the learning process by providing learning and support opportunities, constantly monitoring the learning activities, and being available to support the students when needed (Martin et al., 2018). The excellent facilitation skills exhibited by the course instructor enable students to interact well with the instructor, the content, peers and the technology.

There is a need for instructor connectedness in the virtual learning space, and instructor connectedness refers to "a person's sense of belonging or presence, feelings of support, and level of communication/interaction with the instructor.

Students who perceive a sense of connectedness with their instructor are likely to feel satisfied and perform well in their online courses” (Gallien & Oomen-Early, 2008, p. 468). In addition, D’Alba (2014, p. 8) defines instructor connectedness as the “perceived closeness between the student and instructor as well as the instructor and student.” The closeness between the instructor and the students may manifest in how the instructor regularly communicates with students, the timeous response to students’ queries, the availability to clarify issues, and the provision of timeous feedback from assessment tasks. The instructor’s connectedness heightens the students’ interaction.

One of the essential ways of maintaining instructor presence in online learning is how accessible the constructor is to the students. Students should have access to the course instructor through the ability to contact the instructor in multiple ways, through the contact instructor forum, email, phone or virtual office hours (Martin et al., 2018). Students should be able to access the course instructor as they will feel connected and without support. The feelings of disconnection and lack of support negatively impact students’ engagement in the learning process (Martin et al., 2018).

3.6.2 Course content structured with clear expectations

How online course content is presented to the students influences the way the students learn. Course content presented in different multimedia formats, such as videos, should be self-instructional, and the videos should not be too bulky, hence the importance of segmenting or chunking information to allow the students to engage with manageable pieces of information (Brame, 2016). When students interact with manageable content, chances for retention are high.

In presenting online course content, the instructors should attempt to utilise the different features in synchronous sessions to interact with students, including polls, emoticons, whiteboard, text, or audio and video chat (Martin et al., 2020). As the course instructor reaches out to the different students in different multimedia approaches, the students will be meaningfully involved in learning. The use of different approaches is also given the realisation that the students learn differently, hence the need to consider the individual differences in content presentation. The course instructor should also communicate the course requirements and expectations to motivate and encourage students to learn (Cheung & Cable, 2017).

The course instructor should also humanise the online learning environment in content presentation. In humanising the online learning environment, the course instructor should be empathetic, understand issues from the student's perspective and be sensitive to the students' needs (Pacansky-Brock, 2017). The humanising approaches are deeply rooted in culturally responsive instruction, which emphasises course instructors' awareness of the students' different cultural experiences and shapes teaching and learning to address the differences (Mehta & Aguilera, 2020). Students interact better with content, fellow students and the course instructor in a learning environment where they are valued as unique human beings without exclusion.

3.6.3 Willingness of students to work collaboratively

It is an essential positive factor that students should be willing and able to work collaboratively online to enhance interaction. In collaborative learning, the students are not passive receivers of information but are active students who work in pairs or small groups to co-construct and share knowledge (Straub & Rummel, 2020). Students may be involved in collaborative tasks that require higher-order skills in line with Bloom's digital taxonomy of educational objectives, where they show high abilities such as creating (Husain, 2020). Students may produce, design, or invent authentic technological products through their ability and willingness to work together. Working together in a technological environment allows students to apply knowledge and solve problems, which are critical graduate attributes.

The challenge with group or team-based approaches in collaborative learning is free riders. Some students may not participate in group or team activities. There is a need to ensure that even if students work in groups or teams, measures are implemented to ensure individual accountability (Chen et al., 2018). Students may need to be assessed individually and as a group to ascertain individual contributions to the group activity. Where the individuals exert themselves entirely in a team or group task, productive interaction is necessary for improved learning experiences.

Collaborative learning promotes self-directed and self-regulated learning as the students engage in socially coordinated inquiry and knowledge creation, facilitating higher mental processes through collaborative inquiry (Hadwin et al., 2018). To this

end, as students work together online, they exploit their collective strengths and pool resources for enhanced learning. In self-directed, the students can take charge of their learning and manage the whole learning process from the beginning to the end, with self or peer assessment embedded in the learning process (Boyer et al., 2014). Therefore, students' willingness and ability to work collaboratively is essential for interaction in online learning.

3.6.4 Course instructors providing opportunities for collaborative learning

The course instructors should provide online students with opportunities to work together. The ability to work in a team is one attribute of a graduate expected in the world of work (Faja, 2013). In a study on students' perception of collaborative learning in online courses, it was found that there was a positive relationship between how the students perceived interaction and their perceived learning (Faja, 2013); similarly, Chiong and Jovanonich (2012) found that social learning as students learn by communicating and sharing knowledge benefits students through enhanced learning outcomes. It is, therefore, important for course instructors to involve students in learning activities that promote collaboration, co-construction and exchange of information.

Students who are provided opportunities to work collaboratively online "mutually engage in a coordinated effort to solve the problem" (Suriyakumari, 2016, p. 602). At the centre of any collaborative task should be a problem to solve, and students should be able to harness their collective strengths and knowledge to solve a problem. All students in a group or team should take collective responsibility for the effort and result of the learning process. The nature of the tasks provided to students to work collaboratively on should be that they require the participation of all the group or team members (Suriyakumari, 2016). Interaction is inherently promoted and enhanced when the course instructor deliberately plans for and provides students with opportunities for collaboration. Students learn to be autonomous and to take leadership in learning.

Providing students with opportunities for collaborative learning should be extended to assessment. Traditional assessment is instructor-planned and instructor-led, with the student being assessed by the course instructor. Nevertheless, there is a need to

involve the students to work collaboratively in assessment (Meijer et al., 2020). Students should be involved in peer or group assessment activities where they may assess the learning process and the work of their fellow students, and in the process, students can learn from each other and benefit from different forms of feedback (Zou et al., 2018). Teamwork assessment is crucial as it allows students to assess their and fellow students' contributions to a group activity. Involving students in assessment processes empowers them and heightens their understanding of the learning process.

3.6.5 Internet connectivity

Online learning occurs over the Internet (Mpungose, 2020; Van Deursen & Van Dijk, 2019). Internet connectivity is essential for online learning, allowing students to interact with course instructors, peers and course content. It has been noted that the issues of internet connectivity and the availability of appropriate technological devices were significant challenges to online teaching and learning (Aboagye et al., 2020). Students require data to connect to the Internet to access the LMS and get involved in the learning process, and without connectivity, no learning takes place. This also extends to appropriate bandwidth with the capacity to allow students to connect without challenges. The Internet may be available, yet it may be inefficient (Asio et al., 2021).

In most developing countries, there is great concern about the digital divide as the difference between students with access to high-quality broadband connectivity and those without is vast (Cullinan et al., 2021). Students from poor socioeconomic backgrounds may need access to quality internet connectivity in their homes, negatively impacting their online learning initiatives. In a report, Jordaan (2020) stated that during the initial COVID-19 lockdown in South Africa, about half of the university students needed access to data to connect to the Internet to study online. Given technological and internet access differences, some South African universities devised programmes to support disadvantaged students with data and devices (Du Plessis et al., 2022; Oyedemi & Choung, 2020).

3.6.6 Individualistic tendencies by some students

Interaction in online learning may also be negatively affected by the learning behaviours of some students. As noted by Wildman et al. (2021), there may be a challenge of lack of self-management of team members, which may negatively affect

the involvement of individuals in team or group activities. The lack of proper self-management skills may result in team members' failure to undertake assigned tasks or even forgetting to attend planned virtual group meetings. Such behaviours result in slowed progress in group activities and may ultimately impact the achievement of group targets. Individuals in a group should take responsibility and play an active part in the good of the group.

In understanding the dynamics of teamwork, there is a need to consider individual members' contributions to the team regarding their personality and diversity (Humphrey & Aime, 2014). A team working on a particular task online may be heterogeneous, hence the importance of understanding the individual members' ability to work with others and contribute meaningfully to group activities. Due to cultural considerations, some people may be unable to work with people of a particular gender, religion or race. Some group or team members may be introverts whose learning style is individual-oriented, while others may be over-dominant. In both cases, personalities would negatively affect group activities. There is, therefore, a need to understand group members as individuals and how their personalities assist or inhibit group activities,

The context in which the team activities are carried out may also need to be considered an essential factor affecting interaction (Humphrey & Aime, 2014). Online group activities occur in a technologically mediated environment, and the assumption for effective group activity would be that all team members would be digitally literate to contribute meaningfully. Team members may need to be digitally literate, so their contribution and participation in group activities may be compromised.

3.6.7 Provision of prompt and meaningful feedback

The issue of prompt and detailed feedback is an essential factor influencing the nature and extent of the students' interaction with course content, technology and peers in online learning (Cavalcanti et al., 2021). The students working online require Guidance through prompt and meaningful feedback. Feedback is essential in providing students with information about their strengths and weaknesses in the learning process so that they progress well and improve (Dawson et al., 2019). There are features of a Learning

Management System that produce automated and prompt feedback, which is vital for students' learning progress.

Feedback is more important for students learning online than face-to-face contact learning. Students learning online are separated from the course instructor by space and time. They would require prompt and meaningful feedback, motivating them to continue interacting with course content and peers (Phillips et al., 2019). Prompt and meaningful feedback in online learning activities enhances student satisfaction with an online course. It is, therefore, important in online course design to build vital elements of prompt and meaningful feedback, as feedback is an essential factor influencing progress in online learning.

It has also been noted that assessment feedback in online learning assists students in making important decisions in the learning process, which helps improve their learning outcomes (Pitt & Norton, 2017). As they learn online, the nature of feedback students receive allows them to decide on continuation with a task or revise it, hence the importance of ensuring that feedback is integrated into the learning process. The importance of feedback is captured in Carless' (2015) definition of feedback as a process in which the students can make sense of information regarding their performance and utilise the same information to improve the quality of their work.

3.7 INTERACTION AND ONLINE TEACHING AND LEARNING APPROACHES

Interaction, which is considered by Mu and Wang (2019) as a prerequisite for deep learning in the context of online education, is promoted through the utilisation of appropriate online pedagogies. This section discusses a few selected online teaching and learning approaches, showing how they encourage online interaction. Some teaching and learning approaches discussed include discussion forums, social media, team-based learning, small group activities, problem-solving strategies and peer assessment.

3.7.1 Discussion forums

The modern-day students in higher learning institutions are called digital millennials, who are very interactive and learn by optimally interacting with peers through digital learning platforms (Edeh et al., 2019). An online discussion forum is a digital platform

for online learning that allows students to discuss, share knowledge and disseminate information (Biriyai & Emmah, 2014). The course instructors should utilise online discussion forums to encourage and promote interaction in exchanging ideas for learning. Online discussion forums provide students with opportunities to exchange information conveniently and flexibly beyond the classroom walls, as students can post ideas and respond to posts in the threaded discussion asynchronously on their own time (Premagowrie et al., 2014).

Using an online discussion forum allows students to post messages to the discussion threads and, in the process, interact and obtain feedback from their peers and the course instructor in creating a deeper understanding of the subject matter (Biriyai & Emmah, 2014). The course instructors should deeply entrench discussion as an online learning tool by allowing students to exchange information on a discussion thread. As the students research on a thread, post their opinions, receive comments on their posts and comment on their peers' posts, they deepen their understanding of the issues under discussion. As observed by DeWitt et al. (2014), students' participation in online discussions deepens knowledge construction and fosters independent learning.

An online discussion forum is also a planned educational forum that allows online students to reflect on learning and connect students by sharing information (Adetimirin, 2015). Online students must stay connected in learning as they work together to create and share knowledge. Discussion forums are an essential teaching and learning tool to promote student interaction and collaboration in online learning. The discussion forums should be well-planned, with the course instructor guiding participation moderating and regulating discussion, all to enhance online learning experiences (Adetimirin, 2015).

3.7.2 Use of social media for learning

Another critical online pedagogy is incorporating social media for learning. Social media are internet-based applications on which people create and share content and build social networks (Greenhow et al., 2019). Social media are cheap and convenient ways of obtaining and sharing information (Ansari & Khan, 2020). The students participate in social media activities because of the popularity of such activities. There

is a need to bring social media platforms to online learning. As noted by Elkaseh et al. (2016), social media are perceived as valuable and easy to use by users and, therefore, come in handy for utilisation in the online learning environment. The course instructors should use social media platforms like Facebook, Twitter and WhatsApp to train and sustain knowledge-sharing behaviours (Ansari & Khan, 2020). It is important to note that through social media platforms, knowledge is accessed and shared in different multimedia formats, enriching online learning experiences.

Communication is vital in online teaching and learning, and social media should be utilised to enhance communication in terms of staying connected, bonding and exchanging information (Jaggers & Xu, 2016). As the students participate in sharing information and communicating online through social media, they remain connected throughout the online course. The different media platforms support student-student as well as student-course instructor communication. Online learning is enhanced through sustained communication in cost-effective ways, hence the need to embrace social media in communication. Communication in an online learning environment entails exchanging information, which should be done sustainably (Jaggers & Xu, 2016).

Social media should be utilised to promote collaborative learning in virtual learning environments. There are affordances in social media platforms that allow users to work in groups, and the same affordances should be harnessed for collaborative learning (Greenhow & Galvin, 2020). Students could engage in collaborative content creation activities through applications that enable students to access and work synchronously and asynchronously on an identified digital product (Greenhow et al., 2019). Students contribute collaboratively to creating a digital product and can work together on a single product.

Social media platforms foster community, as students can join and participate in online learning communities (Greenhow & Galvin, 2020). Students can work in groups on a social media platform, and belonging to a learning community where one participates equally as a member and is accepted is an essential element of social presence in online learning. The sense of community is vital in overcoming loneliness as a feeling of belonging to a group as an active participant often results in satisfaction in online courses (Croft et al., 2010). Students should, therefore, be part of online learning

communities, and as part of online course design, the functions of online communities and tasks to be performed should be pre-planned.

3.7.3. Online collaborative learning

The course instructors should foreground the importance of collaborative tasks in online learning. Online collaborative learning strategies are groupings of students as they get involved in group work in a sizable number (Ajayi & Ajayi, 2020). Similarly, collaborative learning involves “small group activities through which students strive for both them and their friends to reach the highest levels” (Kormaz, 2012, p.1162). Students may be provided with opportunities to work on collaborative group projects. The different affordances of the Learning Management System should be utilised for students to conduct projects online. Students who work collaboratively on online group projects should achieve higher-order learning outcomes by generating creative ideas, exploring ideas and applying new knowledge to solve real-life problems in a technological environment (Holz, 2017). Learning should cease to be theoretical but practical in applying knowledge and skills.

3.7.4 Team-based learning

Online teaching and learning may also be enhanced by utilising team-based learning. Team-based learning (TBL) entails students taking ownership of their learning by acquiring knowledge in small groups (Wyszomirska et al., 2021). TBL is also considered an active and structured form of small group learning in which student accountability is realised through participation in defined steps such as pre-class preparation, readiness for learning, problem-solving activities, and immediate feedback (Burgess et al., 2020). In TBL, students apply knowledge and skills through active participation in problem-solving. The course instructors should make learning problem-based as students work in small teams to plan how to solve a problem and solve the problem through clearly defined and documented steps.

3.7.5 Live lessons on video-conferencing platforms

Online lessons could enhance interaction in online learning. Live online lessons are a form of synchronous online learning that takes the form of live virtual classrooms (Vu & Fadde, 2015). This could be through web conferencing. The University of South

Africa (2010, p. 11) defines video conferencing "as an interactive means of communication between two or more locations. The interactivity is accomplished by various means, but the most common include live video and audio feed in both directions". The course instructor may utilise different ways of presenting content through video conferencing, thereby promoting discussion and interaction. According to Mkhonta-Khoza and Rugube (2021), the BigBlueButton offers enhanced classroom interaction synchronously and asynchronously. The BigBlueButton is a software or web conferencing online system designed to offer online classes (Al Hashimi, 2020). Through built-in features such as chat messaging and live audio and video feeds, the course instructor can interact with students, and the students can interact with one another for enhanced online learning experiences (Mkhonta-Khoza & Rugube, 2021).

In the next section, the researcher discusses the global, national and institutional policy context for online teaching, assessing the implications of online interaction to enhance the students' online learning experiences. The policy affects and influences practice; therefore, being aware of relevant policies is essential. The policy context assists in understanding online learning as an imperative in the developments in teaching and learning in the 21st century,

3.8 GLOBAL, NATIONAL AND INSTITUTIONAL POLICIES INFLUENCING ONLINE TEACHING AND LEARNING

In this section, the researcher discussed the policy imperatives around online learning globally, nationally and institutionally, assessing implications for online interaction. It is also essential to discuss the policy context in full realisation that relevant policies inform online learning. The policy imperatives discussed in this section are captured in Figure 3.2.



Figure 3.2: Policy imperatives informing online teaching and learning

As noted in Figure 3.2, several global, national and institutional policies inform online teaching and learning. This section discussion centres on the United Nations (UN) 2030 Agenda for Sustainable Development, The African Union Agenda 2063, the African Union Continental Education Strategy for Africa (CESA 16-25), the Southern African Development Community (SADC) Regional Open and Distance Learning Policy Framework (2012), The Eswatini National ODL Policy, The Eswatini Ministry of Education and Training Sector Policy (2018), The University of Eswatini Blended Learning Policy and The University of Eswatini Teaching and Learning Policy.

3.8.1 The United Nations (UN) 2030 Agenda for Sustainable Development - SDGs

Higher education institutions should play a pivotal role in implementing The United Nations (UN) 2030 Agenda for Sustainable Development with the 17 Sustainable Development Goals (SDGs) (Holmes et al., 2022). SDG Number 4 ("Quality education") aims to "ensure inclusive and equitable quality education and promote lifelong learning opportunities for all." The issues of inclusive and equitable quality

education resonate well with Open and Distance e-learning provisioning. The ODeL mode of delivery is flexible, cost-effective, and essential in enhancing access to education at all levels (Purnomo et al., 2021).

The SGD Goal number 4 also discusses the importance of creating lifelong opportunities for everyone. The ODeL mode of delivery also allows mature adults to continue their studies without attending full-time study. Including students from diverse backgrounds and allowing them to pursue studies regardless of age and other factors improves lifelong learning (Purnomo et al., 2021). The online element of ODeL further allows students to study without any constraints of time, space and place (Farid et al., 2018). Students can study from any place and at any time.

The flexible and multiple entry routes associated with it make ODeL a viable option for delivering higher education to potential students seeking to continue education at any point in life (Maphosa & Bhebhe, 2020). Since ODeL systems operate without rigid entry requirements and may consider mature entry and Recognition of Prior Learning (RPL), lifelong learning is possible as most people who seek access to higher education have opportunities to enrol for studies through the multiple entry routes. Adult students learn better through interaction and sharing of experiences to foster understanding. It is crucial to consider suitable pedagogical and pedagogical approaches to assist adult students enrolled in ODeL programmes in promoting lifelong learning.

3.8.2 The African Union Agenda 2063

The African Union Agenda 2063 states its first aspiration as “A prosperous Africa based on inclusive growth and sustainable development” (African Union Commission, 2015, p. 2). The said aspiration has implications for the role of higher education (HE) institutions in Africa in producing the human resources needed for growth and sustainable development in the continent. HE plays an essential role in investing in human capital development, which contributes to Africa's economic development (Tilak, 2017; World Bank, 2017). To this end, the issue of the role of technology in higher education delivery is critical as higher education systems should produce digitally literate graduates who can operate in a highly technological environment and

ensure students graduate with the requisite skills to contribute meaningfully to the workforce

The African Union Agenda 2063 also states the need for "well-educated and skilled citizens, underpinned by science, technology and innovation for a knowledge society" (African Union Commission, 2015, p 2). There cannot be well-educated and skilled citizens without underscoring the role of technology in transforming higher education. Higher education's role is to produce graduates with the appropriate graduate attributes to spearhead economic development in Africa. As Mbithi et al. (2021) noted, Higher education institutions in Africa would need to work more closely with stakeholders such as industry to inculcate the required attributes in graduates. It is also important to note that attributes such as cooperation, collaboration, communication, teamwork and problem-solving are inculcated through online learning, hence the importance of online learning in higher education institutions in Africa.

In terms of the call to action, which are measures to achieve the AU Agenda 2063 vision, the African Union Commission (2015, p. 14) states that there is a need to "catalyse education and skills revolution and actively promote science, technology, research and innovation, to build knowledge, human capital, capabilities and skills to drive innovations for the African countries." The aspect of revolutionising education with an emphasis on promoting science and technology to build human capital for innovation links closely with online teaching and learning, which embraces technology. The students learning online develop the essential technological skills required to drive innovation. The issue of online teaching and learning should be considered in the broader context of achieving the AU Agenda 2063, which is essential for development in African countries.

The African Union Continental Education Strategy for Africa's (2016 - 2025) first strategic objective is to revitalise the teaching profession to ensure quality and relevance at the different levels of education. One way to revitalise the teaching profession is by upskilling the teachers so that they possess the required technological and pedagogical skills to teach online. The third strategic objective notes the need to utilise ICT to enhance access, quality and management and training systems; the objective is in line with the need to institutionalise online learning in higher education institutions in Africa to improve the access and quality of higher education.

3.8.3 SADC Protocol on Education and Training

The SADC Protocol on Education and Training (1997) defines the regional vision of education and training. Specifically, through Article 4 on Cooperation in Policy for Education and Training, the protocol commits for member states to widen access to education and enhance the quality of education (SADC, 1997). The commitment by the Southern African regional body is consistent with the view by Sadeghi (2019) that open and distance e-learning (ODeL) is positioned as a critical driver to enhance access to education as it presupposes the utilisation of technology in bridging the physical and geographic separation of students and teachers. As further noted by Arinto (2016), technology and internet connectivity allow people access to knowledge without going to a conventional classroom setting to learn.

The SADC Protocol on Education and Training also defines areas of cooperation to ensure that the region has standardised and harmonised education and training policies and programmes (SADC, 1997). In Article 4, the Heads of State and Governments agreed on specific areas of cooperation and that cooperation could be facilitated more effectively by developing and formulating comparable, harmonised and standardised policies to widen the provision of and access to education and training (SADC, 1997). Elsewhere in this review of literature, the researcher alluded to the Eswatini National ODL policy, which stipulates the vision and aspirations of the country insofar as ODeL is concerned and the utilisation of ODeL as a critical driver for enhancing access to education for all.

3.8.4 The Southern African Development Community (SADC) Regional Open and Distance Learning Policy Framework (2012)

One of the challenges associated with ODL provisioning in the SADC region is insufficient ICT and quality assurance capacity, leading to unequal access to education (SADC, 2012). There is, therefore, a need to develop the capacity of ODL institutions in the SADC region to enhance the utilisation of technology in distance education delivery. Improvement in infrastructure, equipment and delivery skills would position the ODL institutions to offer programmes online. In instances where the programmes are offered online, there is also a need to make use of appropriate quality assurance mechanisms. As Udo et al. (2011) noted, online learning should meet some defined quality standards to influence student satisfaction positively.

The seventh policy issue in the SADC Regional Open and Distance Learning Policy Framework (2012) is ODL staff Development and Training (SADC, 2012). Suppose there is a need to develop the capacity of ODL practitioners in the different aspects of PDL delivery, such as teaching and material development. In that case, there is a greater need to develop the capacity of ODL practitioners for online teaching and learning. It has been noted that teaching online in most institutions of higher learning is negatively affected by the course instructors' lack of pedagogical and technological skills by the course instructors (Ndzinisa & Dlamini, 2022). The course instructors whose capacity is developed through deliberately implemented professional development courses will have their teaching online underpinned by theoretical persuasions and would see the need to involve online students in the learning process.

3.8.5 The Eswatini National ODL Policy

The Eswatini National ODL Policy informs ODL provisioning in Eswatini of 2021. One of the key ODL challenges in the Eswatini National ODL policy is the negative perceptions of ODL as a mode of delivery (Ministry of Education and Training, 2021). Negative perceptions about ODL as a viable education delivery system may stem from quality concerns. There is a need to ensure the quality of all the ODL processes and enhance the teaching and learning as well as student support systems to produce high-quality graduates (Zuhairi et al., 2020). Once ODeL institutions operate with effective teaching and learning methods and student support systems, they can produce high-quality graduates; negative perceptions will ease away.

The Eswatini National ODL policy also points out inadequate ICT infrastructure and the high cost of internet connectivity as challenges affecting ODL provisioning in the country (Ministry of Education and Training, 2021). The effective delivery of online courses is only possible if the country and institutions of higher learning have the necessary ICT infrastructure and students have access to affordable, reliable, robust and stable internet connectivity (Oyedemi & Choung, 2020). Most of the online pedagogies that enhance interaction in online learning require seamless internet connectivity for students to derive maximum benefits from the online learning experiences.

The fourth Key Focus Area of the Eswatini National ODL policy is on Staffing, Training and Development, which centres on the realisation that “ODL institutions in Eswatini lack appropriately qualified ODL staff for the development and delivery of ODL” (Ministry of Education and Training, 2021, p.18). The policy further underscores the need to entrench continuous professional development programmes in institutions to develop the capacity of ODL practitioners. Facilitation of online courses is different from teaching using traditional approaches, hence the need to equip ODL practitioners with appropriate e-pedagogical skills (Khurshid, 2020).

The Eswatini National ODL policy also focuses on student support, which notes that students studying through the ODL mode of delivery have limited student support (Ministry of Education and Training, 2021). The issue of student support is essential in online learning, as using technologies in learning compels institutions to offer adequate technical and academic support. Rotar (2022) underscores that implementing effective and adequate student support systems is a prerequisite for student success in online courses. The students may experience challenges in their interaction with technology, and with adequate support, they may engage meaningfully in learning. Student academic support systems assist students to engage in learning by learning collaboratively and cooperatively to attain learning outcomes.

The issue of the application of ICT in ODL is another important one in the Eswatini National ODL policy as it is underpinned by the realisation that there is limited availability, capacity and use of ICT in the development and delivery of programmes in the country (Ministry of Education and Training, 2021). The challenges around limited ICT infrastructure, poor connectivity and low bandwidth negatively impact online learning in institutions of higher learning. Online learning and students' participation in it require excellent ICT infrastructure, internet connectivity and a substantial bandwidth.

3.8.6 The Ministry of Education and Training Sector Policy 2018

The education landscape in Eswatini, from primary to tertiary level, is informed by the National Education Sector Policy (2018). On the issue of the role of technology in education, the policy states that the "MoET shall facilitate enabling environments for the use of ICT in all education and training establishments by digitisation of information

relating to curricula, mobile learning, e-learning, e-assessment and e-governance" (Ministry of Education and Training, 2021, p 26). The commitment by the Ministry of Education and Training to embracing technology to transform education delivery is consistent with initiatives of online teaching and learning in institutions of higher learning. The views about the importance of e-learning are also shared by Goyal (2012), who states that e-learning is the future of education.

One of the policy's higher education objectives is "to accommodate students' diversity through a flexible entry-level assessment which recognises different ways of demonstrating understanding, knowledge and language differences" (Ministry of Education and Training, 2021, p. 50). The desire to deal with diversity and flexibility in entry routes to higher education programmes is essential to the objective. Distance education programmes provide the needed flexibility and enhance access to higher education. All the potential higher education students who meet entry requirements should be accommodated in the different programmes so that no one is excluded.

On the aspect of non-formal education, adult education and lifelong learning, one of the policy objectives is "to improve education access and quality by using different modes of learning, including open and distance learning (Ministry of Education and Training, 2021, p. 53). The objective places ODeL at the centre as a critical driver of open access to education. Open and distance learning as a mode of delivery frees the student from any time and place restrictions, thereby providing open access to education and widening the participation levels in education (Ghosh et al., 2012). The National Education Sector policy supports ODeL initiatives in the country.

3.8.7 The UNESWA Blended Learning Policy

The University of Eswatini's blended learning policy makes it mandatory that all courses offered in the University should be combined with the traditional face-to-face and online approaches (University of Eswatini, 2020). The Moodle LMS is the official digital learning platform of the University. According to Mthethwa-Kunene and Maphosa (2020), many course instructors and students used the Moodle LMS well before the COVID-19 pandemic. The COVID-19 pandemic further exacerbated the use of the LMS as most course instructors were forced to reach out to students online. The UNESWA Blended Learning policy notes the ubiquitous nature of technologies

and how they should be embraced in enhancing teaching and learning. The policy further notes that students have access to mobile devices, and this is consistent with findings by Mthethwa-Kunene and Maphosa (2020) that students have access to mobile devices such as mobile phones and tablets and that these should be utilised for learning.

The UNESWA Blended Learning policy notes that the students' and course lecturers' possession of mobile devices is optional. However, it uses the devices in pedagogically sound ways to enhance teaching and learning (University of Eswatini, 2020). The preceding view from the policy is inconsistent with the view that in light of the sudden transition from traditional face-to-face teaching to online teaching, there was a need to invest in course instructors' pedagogical strategies (Green et al., 2020). Therefore, the importance of training course lecturers in online pedagogies must be considered as it is required for effective online teaching and learning transactions.

The Moodle Learning Management System is recommended as the official digital learning platform for all online teaching and learning activities (University of Eswatini, 2020). Like any other LMS, Moodle has essential functions such as content management, assessment, communication and course administration (Swart, 2015). In the context of the present study, the online learning experiences studied were from the Moodle LMS. The implications for effectively utilising an LMS are in the support and training of students and course instructors in technology usage.

3.8.8 The UNESWA Teaching, Learning and Assessment Policy

The Teaching, Learning and Assessment Policy in the University of Eswatini is in line with requirements from the higher education regulatory authority, the Eswatini Higher Education Council (ESHEC), which makes it mandatory as a quality standard that institutions of higher learning should operate teaching and learning policies. Such policies are meant to direct teaching and learning activities in the institutions and should be communicated effectively to staff and students (University of Eswatini, 2018). The teaching and learning conducted online in the University is informed by approved teaching, learning and assessment policy, which spells out the standards and expectations of teaching and learning in the University,

One of the standards specified in the policy is student engagement, which states that teaching and learning in the University should be intellectually stimulating, fair, and authentic and encourage active participation and collaboration (University of Eswatini, 2018). It is crucial for course instructors to underpin their pedagogies, especially online pedagogies, on active learning and collaboration to enhance the learning experiences (Montrezor, 2021). Therefore, according to the UNESWA teaching and learning policy, there is a need for more student-centred learning approaches. The student-centred approaches, which utilise active learning and collaborative techniques, are consistent with the interaction issues in online learning sought in the present study.

The UNESWA teaching, learning and assessment policy points to inclusivity, where the teaching and learning methods, assessment and environment must be accessible to all students (University of Eswatini, 2018). In the University where the Moodle Learning Management System has been adopted as the official digital learning platform, teaching, learning, and assessment should be accessible to all students. There are challenges with the availability of appropriate devices and internet connectivity, which negatively impact access to online learning by students. Therefore, the University needs to support students, especially those from disadvantaged backgrounds, with data and devices so that they meaningfully participate in online learning.

The UNESWA Teaching, Learning and Assessment Policy also pronounces the importance of continuous professional development for course instructors in the University by emphasising the need to upgrade knowledge, skills and expertise in teaching and assessment, especially in online teaching (University of Eswatini, 2018). In the context of the present study, it is essential to note that high levels of interaction in online learning are promoted in instances where the lecturers can use appropriate online teaching and learning approaches, which includes the utilisation of mobile technologies for learning to the satisfaction of the students (Maphosa et al., 2021).

3.8.9 The IDE Blended Learning Quality Assurance Framework

The Institute of Distance Education at the University of Eswatini quality assures all the courses offered online through the Moodle LMS by utilising an approved quality assurance framework (Institute of Distance Education, 2020). The said quality

assurance contains ten quality standards, which are the areas of focus that should be considered in maintaining quality. On the quality standard of programme or course design, for example, the framework notes as one of the criteria that at the programme design stage, measures should be put in place to ensure that the programme enhances access and success for all students, including for students with special needs (Institute of Distance Education, 2020). The issue of appropriate and inclusive teaching and learning becomes essential as the programme is designed.

At the level of programme design, the quality assurance framework further pronounces the need to state and justify the appropriate technologies to support the provision of course materials to students and for teaching and learning processes (Institute of Distance Education, 2020). The issue of technology selection is vital as student-technology interaction is a fundamental requirement for effective online teaching and learning (Van den Berg, 2020). In instances where an identified LMS will be used for online teaching and learning, there is a need to consider how the students will be able to use the digital learning platform and the features that promote interaction.

On the quality standard of the student support system, the Blended Learning quality assurance frame has a criterion on how the LMS should make provision for students to raise queries and receive responses from responsible people in the University (Institute of Distance Education, 2020). The mentioned criterion alludes to the need for interaction between students and critical role-players in the course through constant, sustained and meaningful communication. The importance of communication between students and course instructors is also underscored by Alawamleh (2020), who states that communication channels should be open and maintained in virtual learning spaces to improve the students' learning experience and create a favourable setup.

The issue of providing meaningful feedback is also a quality issue, as the framework notes that course instructors should be trained to teach online and manage the giving of constructive and timely feedback (Institute of Distance Education, 2020). It is a positive quality indicator if all the course instructors engaging students online are trained in all aspects of online course management, from course design to assessment. The same view is shared by Ndzinisa and Dlamini (2022) that the transition to online teaching in the COVID-19 environment had been negatively

affected by the course instructors' lack of training in the different aspects of online delivery. Providing feedback to students learning online is crucial to assist students in learning and progress towards attaining the set learning outcomes. Through staff training and quality assurance of online learning, efforts are made to strive for the best learning experiences (Maphosa et al., 2020).

In this section, the researcher discussed the policies informing online learning in general and assessing implications for online interaction. The discussion of the global, national and institutional policy context was considered necessary in underscoring the importance of meaningful online learning as an essential paradigm shift as informed by different policies. The issue of online learning is not accidental but carefully thought as espoused in the discussed policies.

3.9 CONCLUSION

In this chapter, the research reviewed literature germane to the study. The chapter commenced by explaining what a literature review is and assessing its role in building a research study. In the chapter, the researcher then reviewed the literature on interaction online and assessed online learning as a mode of educational delivery in the technologically mediated environment. The literature was also reviewed on the benefits of interaction in online learning and ways of ensuring student support for interaction. The literature review also assessed the factors promoting and hindering interaction in online learning and the pedagogical implications of interaction in online learning. The chapter ended by describing the policy imperatives informing online teaching and learning. In the next chapter, the researcher discusses the methodological processes and procedures for the study.

CHAPTER FOUR

RESEARCH METHODOLOGY

4.1 INTRODUCTION

The researcher's review of the pertinent literature in the preceding chapter established a solid scholarly foundation for the study. The researcher now analyses and justifies the methodological procedures and processes used in the study in this chapter. The main issues of this chapter are the research paradigm, research approach, study design, instruments for gathering data, population, sample, sampling procedures, validity, reliability, data trustworthiness, data analysis, and concerns regarding ethics.

4.2 RESEARCH PARADIGM

This section addresses the notion of research paradigm research to elaborate on why a particular research study should be positioned within a research paradigm. The post-positivist research paradigm is examined and justified as to why the current study fits inside it, as stated in Section 1.9.1 of the first chapter. Figure 4.1 illustrates the issues raised by the discussion of the research paradigm.

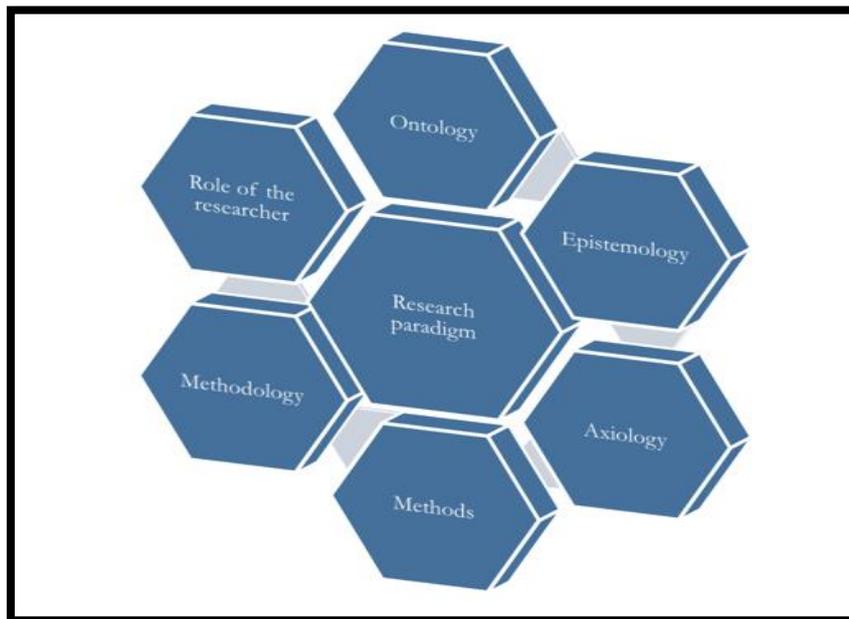


Figure 4.1: Understanding the research paradigm (Researcher's own)

4.2.1 Unpacking research paradigm

A research paradigm provides research assumptions and is a philosophy or worldview of what it implies (Rehman & Alharthi, 2016). In a sense, a paradigm is the basis of research because it expresses how an individual views the world and how to investigate it (Grix, 2004). Ontology, epistemology, methodology, and procedures comprise a paradigm incorporating philosophical presumptions regarding research (Rehman & Alharthi, 2016). A paradigm is also the researcher's "worldview," which is an approach or school of thought for comprehending research and interpreting study results (Kivunja & Kuyini, 2017). How research is perceived affects how one conducts research, which affects the methodological processes and procedures, the data gathered as a result, and the methods used to analyse and interpret that data. A research paradigm is about scientists' and researchers' shared convictions, presumptions, and understandings regarding how issues should be understood and addressed (Lam, 2018).

4.2.1.1 Ontology

According to Richards (2003, p.33) ontology is "the nature of our beliefs about reality." There are various ways to view reality, affecting how researchers view reality in their studies. The type of reality that researchers believe to be actual influences how they do their research (Rehman & Alharthi, 2016). Researchers may have the opinion that there is a "singular, verifiable reality and truth [or]... socially constructed multiple realities" in the various perspectives on reality (Patton, 2015, p.134). The basis for the research, the kind of instruments to be utilised, and the kind of data to be collected all depend on how the research perceives reality. A completely positivist-empiricist approach to study is assumed when the researcher sees reality as singular and verifiable. In contrast, an interpretive-qualitative approach is assumed when the researcher perceives reality as multiple socially constructed realities.

As further defined by Crotty (2003, p.10), ontology is "the study of being" that aims to comprehend the nature of the universe under investigation through comprehending the nature of existence. Similarly, Cohen et al. (2018) point out that ontological presumptions address inquiries into the nature of reality and what can be known. According to Pring (2015), some researchers believe that the world is independent of them and that their task is to observe and find relationships, patterns, and causal

explanations. All of this can be empirically tested. Such ontological presumptions indicate that a researcher is quantitative and will conduct research using quantitative procedures.

According to Andrews (2016), research aims to discover reality, and ontology concerns the nature of reality. The method by which a researcher conducts a study depends on their understanding and perspectives of reality and methods for discovering it. The researcher's approach to collecting data is influenced by their presumptions about objective or subjective reality. The interpretive methodologies are used if the researcher believes in shared social reality or numerous context-specific realities (Ormston et al., 2014). Such a strategy would oppose the researcher who pursues quantitative and measurable evidence because they believe in objective reality.

Because there are numerous and frequently incompatible ways to comprehend reality, interpretive researchers contend it is challenging to capture or depict social reality effectively (Cohen et al., 2018). According to this theory, the research methods used by these researchers are impacted by the presumption of various context-specific realities subject to the role-players' subjective perception. The approaches and methodologies used by interpretivist researchers would be consistent with their ontological position regarding the research philosophy since they would not approach research through a quantitative-empiricist lens.

The positivists' ontological stance is that social phenomena and their meanings cannot change and that life is characterised in 'measurable' terms rather than by inner experiences (Al-Saadi, 2014). In keeping with their objectivist ontological viewpoint, which directs their research methodological processes and procedures, they assume that reality is objective. A constructionist ontological position, in contrast, asserts that reality is socially produced and not shared since people see and build reality differently (Al-Saadi, 2014). Objectivism and constructionism take different approaches to study because of their divergent ontological positions.

The ontological viewpoint one holds justifies the selection and determination of a study's methodology and procedures and how data is gathered, analysed, interpreted,

and presented. The ontological persuasion in the present study was that of a holistic understanding of issues through a combination of viewpoints; as a result, the research's ontological position was neither purely objectivism nor constructionism but a combination of the two, which led to the choice and justification of the post-positivist research paradigm as discussed in detail in section 4.2.2. This was consistent with the "broken nets" analogy, which emphasises the value of utilising the advantages of several points of view.

4.2.1.2 Epistemology

According to Crotty (2003), epistemology is the study of knowledge. The underlying principles of epistemology centre on what constitutes helpful knowledge, what is valuable knowing, and how knowledge claims are made. Similarly, Bryman (2008) points out that epistemology explores the nature of fundamental knowledge and appropriate approaches to knowledge research. As mentioned earlier, the perspective is consistent with the idea that knowledge and knowing are at the heart of epistemology (Mason & Bromme, 2010).

According to Cohen et al. (2018), one perspective on epistemology is that it is about the presumptions that one has about the nature of knowledge, its form, and how it is gained and shared with others. It is crucial to realise that the researcher seeks knowledge and truth while conducting their research and that their assumptions influence this engagement. According to the positivist perspective, knowledge is immutable, quantifiable, and verifiable, and research methodologies are affected by such presumptions. Additionally, the researcher will use natural science methods like testing and measurement to look for knowledge if knowledge is seen as being complex, objective, and tangible on the one hand (Al-Saadi, 2014).

Positivists assume that knowledge is determined by collecting facts and in the social sciences. The objective explanation of human behaviour assists in a better understanding of the social world (Al-Saadi, 2014). Assuming that facts should be established as the final output of authentic knowledge, positivists would use techniques from the natural sciences to examine human interaction and behaviour. The positivists' view of proper knowledge may not hold for knowledge that is not

quantifiable and variable. How a researcher conducts research is significantly influenced by their choice of epistemological stance.

Interpretivist qualitative researchers would employ techniques involving individuals in knowledge generation because they consider knowledge personal, subjective, and distinctive (Al-Saadi, 2014). The interpretive-qualitative researchers' research methodology differs from the positivists since they believe in the co-construction of knowledge and emphasise the participants' subjective experiences. According to interpretivists, all knowledge is subjective and context-dependent, based on personal experiences (Greene, 2010). The empiricists' perspective of measuring and assessing objective knowledge starkly contrasts such a viewpoint.

Interpretivist researchers reject the objectivist notion that knowledge is merely there to be identified and gathered in favour of the hypothesis that humans build knowledge when interpreting their experiences of and in the world (Pascale, 2011). Interpretivist researchers would conduct studies to comprehend how participants interacted with one another and their surroundings. The research aims to comprehend knowledge from the participants' perspectives fully.

According to the interpretivist epistemological perspective, knowledge is created by human interaction within a particular social context, not by discovering meaning (Crotty, 2003). Understanding human interaction in knowledge construction is the most crucial issue. Instead of using participants as study subjects, the researchers conduct their studies in collaboration with them as co-researchers. Since they are not considered study subjects, participants in qualitative studies have a deeper relationship with the researchers and are more engaged in the research process, according to Pope (2020).

The explanation above makes it evident that one's epistemological viewpoint affects the approach and procedures of a study, as well as how data is gathered, analysed, evaluated, and presented. The epistemological positions of both paradigms were used to influence the research process in the present study because the research's ontological position was not pure positivism or interpretivism but a combination of the two. This justifies the choice and justification of the post-positivism research paradigm,

which is covered in more detail in section 4.2.2. The researcher engaged in what Ghiara (2020) termed epistemological pluralism.

4.2.1.3 Axiology

According to Zaidi and Larsen (2018), axiology is the study of values and is regarded as the general theory of the nature of values or values. Aesthetics, ethics, and value judgment are also a part of axiology (Biddle & Schafft, 2015). Research values are viewed differently according to different paradigms. A particular paradigm's value systems impact vital areas of the research process, including formulating research questions, selecting participants, using research tools, and collecting and analysing data (Nguyen, 2019). Similarly, Zaidi and Larsen (2018) point out that research values affect how a paradigm, methodology, and methodologies are related.

An explanation of the relationship between the researcher and the researched is provided by axiology, concerned with the "worthwhileness" of research concerning its goals and ideals (Watson, 2005). The positivist research paradigm places a strong emphasis on objectivity. It separates the researcher from the subject being studied to maintain researcher neutrality, leading to the conduct of research that is devoid of bias. According to Given (2008), maintaining objectivity in research requires conducting an investigation that is not swayed by the researcher's ideas, opinions, perspectives, or background. Therefore, a research study from a positivist persuasion utilises research tools that do not allow research involvement or interaction with the research subjects in a way that would affect the research in some form of bias.

The interpretivist research paradigm asserts that since the researcher is a research instrument and cannot be isolated from the subject of the investigation, research is value-laden and value-bound (Wa-Mbaleka, 2020). The researcher interacts with the study participants during data collection, processing, and interpretation and is fully involved in the research process (Xu & Storr, 2012). The researcher is active in the reflective and reflexive process of data collection through in-depth studies, frequently through phenomenological interviews (Pezalla et al., 2012). As a result, when conducting a study guided by the interpretive research paradigm, the researcher actively gathers data and engages with participants to better understand their subjective experiences.

Value pluralism was selected as an axiological perspective in the current study, which is situated within the post-positivist research paradigm. According to the semi-structured interview that was used, which is described in detail in section 4.6.1, the positivist component of the study required the researcher to be impartial and detached while maintaining a high degree of objectivity in data collection and interpretation. According to Savin-Baden and Major (2013, p. 71), positionality, or "the position that the researcher has chosen to adopt within a given research study," is influenced by the values of research as informed by a paradigm. The researcher tried to remain impartial and objective because positivism was a foundation for the study's quantitative component. The qualitative aspect was value-laden as the researcher was involved in the study by interacting with the participants in focus group discussions, as explained in section 4.6.2. The researcher played a pivotal role as a research instrument and could not be separated from the research (Wa-Mbaleka, 2020).

4.2.1.4 Methods and methodology

The research paradigm in which a study is situated affects the methodological decisions made in that study, including the research methodologies, research designs, and procedures used in that study (Ugwu et al., 2021). According to Mertens (1998), "methodology" refers to all the study techniques, designs, methods, and procedures used in a scientific investigation. A study may use a quantitative, qualitative, or mixed-methods approach regarding research methodologies. The present study adopted a mixed methods research methodology, addressed and justified in Sections 4.3.1 and 4.3.2, following the post-positivist research paradigm. Denzin (2010, p. 425) emphasises the value of a mixed-methods research approach and encourages research that "celebrates paradigm and methodological diversity."

The mixed methods research approach, influenced by the post-positivism research paradigm, guided the current study's research design. As described and justified in sections 4.4.1 and 4.4.2, the concurrent triangulation design used for the current investigation is consistent with the mixed methods research approach. As stated by Castro et al. (2010), the primary goal of using a concurrent triangulation design in a mixed-methods study is to gather both qualitative and quantitative data simultaneously to use both data sets to derive a comprehensive understanding of the issue under

investigation. In the present study, the online interaction experiences of distance education students were understood quantitatively and qualitatively. The quantitative responses were combined with the deconstructed qualitative narratives of the experiences.

Regarding methodologies and procedures, the current study collected quantitative data by administering a structured questionnaire described in section 4.7.1. Additionally, focus group discussions were used to produce qualitative data using a semi-structured interview schedule described in section 4.7.1. Triangulation is crucial in the post-positivist research paradigm and the mixed methods research approach. According to O'Cathain et al. (2010), triangulation combines data from several sources to get a more comprehensive picture of the subject under study, following the axiom that "the whole is greater than the sum of the parts." The choice of a contemporaneous triangulation design within a mixed-methods study reflects the recognition that understanding a problem alone from a quantitative perspective may have limits that are overcome by incorporating the qualitative perspective.

4.2.1.5 Role of the researcher

The research paradigms' epistemological, ontological, and axiological presuppositions impact the researcher's role in the research process. The researcher needs to be more theoretically present in studies supported by the positivist research paradigm (Greenbank, 2003). Similarly, Yilmaz (2013) observes that in positivist research, the researcher is separated from the research subjects because it is assumed that they are independent and separate from one another. To establish high levels of objectivity, the researcher must maintain neutrality and detachment while gathering data for the study's quantitative component. According to Khatwani and Panhwar (2019), objectivity aims to eradicate all traces of subjectivity and bias. According to Khatwani and Panhwar (2019), the study conducted using the positivist research paradigm is value-free, and the researcher should not affect the results.

The researcher must engage with the research participants while gathering qualitative data. According to Devetak et al. (2010), the researcher should collect information from rich sources. In the case of the present study, the target was distance education students and how they interacted with online learning. The information gathered emanated from the participants' narratives of their actual experiences, which were

situation- and context-specific in the rural-based university. A qualitative study explores an individual's subjective experiences and highlights the significance the individual places on the experiences following the interpretative paradigm's guiding principles (Cohen et al., 2018). Due to the researcher's interaction with the research participants as co-participants in the study, the qualitative aspect was, therefore, value-laden.

4.2.2 The post-positivist research paradigm

Paradigms are "not simply methodologies," according to Hammersley (2013, p.13), but rather "ways of looking at the world" or various "assumptions about what the world is like and how we can understand or know about it." The post-positivist research paradigm is where the current study is situated. This paradigm emerged in response to the conflicts that set positivism and interpretivism against one another (Williams, 2020). The paradigm was emphasised the incompatibility of quantitative and qualitative research (Bryman, 2006). It was believed that the positivist and interpretivist paradigms were incompatible and could not coexist in a single study. To oppose logical empiricism, the post-positivist research paradigm emerged, and this realisation led to the understanding that the two paradigms should not be seen as competing but rather as complementing each other in research.

In order to understand the world as multi-layered and with numerous interpretations, social science researchers firmly contend that there are multiple worldviews (Williams, 2020). To this aim, methodological pluralism is an alternative because neither the positivist nor the interpretivist perspectives can offer comprehensive knowledge of a problem under inquiry (Morris & Burkett, 2011). The primary consideration of post-positivism is the issue of mixing research methodologies since it recognises the limitations of a single approach and how doing so enriches a study by fostering a thorough comprehension of the topic at hand. According to the post-positivist research paradigm's epistemological tenets, knowledge is viewed through many lenses shaped by various beliefs, theories, and values (Cohen et al., 2018).

Post-positivism acknowledges that research that relies on observations and measurements frequently contains mistakes and that no approach or perspective can fully address a research question or reflect the external world (Phoenix et al., 2013).

In post-positivism, objectivity is not taken for granted but reached by considering many approaches and viewpoints. Bryman (2012) emphasised that it is essential to use various research techniques to answer research problems in a scholarly-acceptable manner. It is significant to note that the researcher integrated the positivist and interpretivist philosophical frameworks to situate the current study within the post-positivist research paradigm (Fetters, 2016). In a single study, the objectivity of the quantitative research approach is blended with a qualitative approach's comprehension of the participants' subjective experiences.

4.2.3 Justification of the post-positivist research paradigm

The choice for locating the present study in the post-positivist research paradigm was justifiable for numerous reasons. First, the researcher intended to gain a holistic understanding of online interaction experienced by distance education students. The utilisation of the post-positivist research paradigm assisted the researcher in overcoming the differences in the ontological stance of positivism and interpretivism (Dawadi et al., 2021). The objective reality (positivist) and subjective reality (Interpretivist) were combined in a single study to understand online interaction fully.

The post-positivist research paradigm was also adopted because of the epistemological assumptions of the researcher. One epistemological assumption in the present study was that there is no absolute truth (Levers, 2013). In undertaking research from a post-positivist epistemological persuasion, there is the full realisation that truth exists but can only be understood by continuous efforts to search, gather more information and embrace other perspectives of looking at truth (D'Eon, 2020). The issue of online interaction could not be exhaustively understood from the positivist lens, hence the need to bring in the interpretivist perspective. The researcher believed that a single truth could be discovered scientifically. However, that truth was socially constructed, hence the need to interact with critical role-players in understanding the truth to complement what is discovered scientifically (Takahashi & Araujo, 2020).

The post-positivist research paradigm also underpinned the study because the researcher believed in the existence of multiple truths. That truth is better understood from the point of view of the participants' experiences (Krauss, 2005). An investigation that attempts to understand and appreciate the participants' experiences contributes

to the complete authenticity of the truth. The distance education students involved in online learning were interviewed to bring out their experiences of online interaction. The use of interviewing through FGDs assisted the researcher in deriving an in-depth understanding of online interaction, and this is consistent with the view of interpretive research's desire to gain an in-depth understanding of social issues (Nyumba et al., 2018).

The researcher did not seek complete detachment from the research and the research process, hence the adoption of the post-positivist view that there should be a mutual influence between the researcher and the researcher (Krauss, 2005). The researcher brought in the interpretivist aspect of directly interacting with the research participants and empowered them by researching with them to understand their experiences from how they conducted online learning. Therefore, by combining axiological positions of positivism and interpretivism, the researcher enjoyed both researcher detachment and full engagement in a single research study. Such an approach enriched the researcher's experiences and those of the research participants. Having discussed and justified the research paradigm, the researcher discusses the research approach in the next section.

4.3 RESEARCH APPROACH

Research approaches are the methodological processes and procedures that include the steps from broad assumptions to specific data collection methods, analysis, and interpretation (Cohen et al., 2018). There are three research approaches: quantitative, qualitative and mixed methods (Creswell, 2014). The present study followed a mixed-methods research approach.

4.3.1 Mixed Methods Research Approach

On the continuum of the research approaches are the quantitative research paradigm on the one hand and the qualitative on the other. The mixed methods research approach stands in the middle of the continuum. The mixed-methods research approach entails a research approach that combines quantitative and qualitative approaches by including both quantitative and qualitative data in a single research study (Gay et al., 2012). As further stated by Creswell and Plano Clark (2017), mixed-

methods research should include at least one quantitative component and one qualitative component. The components of the study that could be included could be the nature of the research questions, the collection and analysis of data, and the interpretation of results.

The mixed-methods research approach is also explained by Tashakkori and Creswell (2007, p. 2) as research in which the researcher "collects and analyses data, integrates the findings, and draws inferences using both qualitative and quantitative approaches or methods in a single study or program of inquiry." It is clear from the preceding explanation that both quantitative and qualitative data should be collected and analysed in a single study. Both data sets are supposed to be integrated at the interpretation stage, and the inferences and conclusions drawn emanate from the integrated data. Both data sets illuminate the findings, providing the researcher with the basis for inferences and conclusions from the study.

The mixed methods research approach notes the strength of combining multiple methods to understand a research problem. To this end, more than one data source may be required to understand a research problem, as qualitative data provide an in-depth understanding of a phenomenon. In contrast, quantitative data would provide a broader and more general understanding (Creswell, 2014). There needs to be more than one data source to provide a complete picture of a research issue or answer the research questions sufficiently. The combination of quantitative and qualitative data provides a fuller understanding of the issue under investigation from multiple perspectives. As underscored by Creswell and Plano Clark (2017), utilising qualitative and quantitative data in a single research study provides depth and breadth to a study.

As further noted by Creswell and Plano Clark (2017), combining quantitative and qualitative approaches in a single research study provides a better and more comprehensive understanding of a research issue or complex phenomena under study. In this regard, combining the two approaches in a single study may play a complementarity role (Molina-Azorin, 2016). In the said role, results from the quantitative approach may assist in complementing the results from the qualitative one, thereby elaborating and providing better clarity to the study. In the context of the present study, research results from both approaches were integrated at the data

analysis stage to provide a fuller picture of online interaction experienced by distance education students.

A single study's combination of quantitative and qualitative approaches may be utilised for development purposes (Molina-Azorin, 2016). For such a purpose, data may be collected in phases and analysed separately as results from one approach are utilised to inform the planning and use of the other. In this regard, the researcher may analyse results collected quantitatively and identify inadequacies or deficiencies, which may inform how the other method could be utilised; one approach is then utilised to enrich the other, whose planning and implementation depend on the other. In the present study, qualitative and quantitative data were collected concurrently, as discussed in Section 4.4.1; hence, the purpose is the complementary function of data.

The utilisation of quantitative and qualitative methods in a single study may serve an expansion purpose (Molina-Azorin, 2016). The aim would be to extend the breadth and range of the research inquiry by strengthening the study using multiple methods of inquiry. In collecting data through quantitative methods, the researcher may also employ qualitative ones to expand the scope of the study by broadening understanding. The purpose of the mixed-methods research approach was inherent in the complementary purpose of the present study, as the utilisation of both approaches assisted in bringing out the reasons behind some of the choices made in the highly structured quantitative questionnaire items. The FGDs managed to interrogate the 'why' questions, bringing to the fore the inner feelings of the participants.

The utilisation of the mixed methods research approach also serves to strengthen a research study as the researcher can combine statistical elements with the qualitative thematic approaches, which assist in eradicating over-reliance on statistical analysis to draw conclusions but also capture essential views and experiences (Jogulu & Pansiri, 2011). In understanding distance education students' experiences of online interaction, some responses were analysed and presented statistically in line with the quantitative component of the study and the qualitative narratives were also brought in to strengthen the study. The approach is consistent with the realisation by Teddlie and Tashakkori (2010) that the mixed methods research approach is a comprehensive

technique for social science research as it thrives on integrating thematic and statistical data.

4.3.2 Justification for the mixed methods research approach

The utilisation of the mixed methods approach in the present study was made on the realisation that combining research methods resulted in a strengthened study (Creswell & Plano Clark, 2017). The researcher could have employed the quantitative approach as the sole approach for the study but considered it necessary also to utilise qualitative techniques and combine them with the quantitative ones to strengthen the study. As noted by Loo and Lowe (2011), the researcher can understand the studied phenomenon using different methods in combining research methods.

The two main research approaches, quantitative and qualitative, have inherent weaknesses, deficiencies or biases, hence the justification for combining research methods to address the weaknesses or deficiencies (Loo & Lowe, 2011). Therefore, combining research methods gives the researcher a more complete or accurate picture of the issue under investigation. Investigating the online learning interaction experiences of distance education students using a mono-method approach may not provide an accurate picture of the issue under investigation, hence the researcher's choice to follow a mixed-method approach.

The utilisation of the mixed methods approach in the present study was also considered, given the importance of triangulation in research. As Gibson (2017) explained, triangulation as a methodological technique entails using a multi-method approach in which various investigative methods are applied to the same phenomenon. The mixing of methods for the illustration of a bigger picture is the triangulation strategy adopted in the present study in which qualitative and quantitative data were collected, analysed and interpreted to conclude the distance education students; experiences of online interaction. As further noted by Ashour (2018), combining qualitative and quantitative data in a single study provides depth and detail to a study.

The mixed-methods research approach was also followed in the present study as it allowed the research questions to be studied from different perspectives (Regnault et

al., 2018). As noted in section 1.4.1 in the first chapter, the study sought to answer six sub-research questions and all the questions were studied from both the quantitative and the qualitative perspectives. The first sub-research question, for example, sought students' understanding of interaction in online learning. Data on the question were collected from a semi-structured questionnaire in line with the quantitative perspective and from focus group discussions in line with the qualitative perspective. Therefore, the students' understanding of online interaction was studied from different perspectives.

The mixed-methods research approach was utilised in the present study as the researcher believed that contrary to the paradigm wars of the past, the quantitative and qualitative research approaches are not competing. However, they complement each other in research (Johnson et al., 2007). To this end, the researcher deliberately sought to complement quantitative data with qualitative data in seeking complete answers to particular research questions pursued in a study. Furthermore, the researcher did not consider the two approaches in terms of the superiority of one over the other, hence the need to combine them in a single study to complement each other.

The justification for following a mixed-methods research approach was made on the realisation that quantitative and qualitative research approaches have strengths and weaknesses, and neither of them is sufficient to capture the trends and details of an issue under study in social science research (Creswell et al., 2004). It is, therefore, essential to combine the two to obtain a more complete analysis; hence, they should complement each other. Integrating data from the two approaches was deemed necessary in assisting the researcher with the complete analysis of the issue under investigation.

The researcher justified the choice of the mixed-methods approach for the present study. In the next section, the researcher discusses the research design.

4.4 RESEARCH DESIGN

Research design is the plan that allows the researcher to transform the research questions into a framework of strategies and methods that will assist with systematically answering the questions (Neri & Kroll, 2009). Furthermore, a research design is a well-planned and justified roadmap to answering the set research questions (Cameron, 2011). As Yin (2013) noted, research design is a structure of a research inquiry meant to deal with a research problem logically. On the same note, McMillan and Schumacher (2010) define research design as a plan that the researcher utilises for sampling the participants or research subjects, selecting the research sites, and the selection and justification of the data collection procedures in answer to the research questions.

In this section, the researcher discusses and justifies the research design. The concurrent triangulation design is explained and justified as the appropriate mixed methods research design.

4.4.1 Concurrent triangulation design

The present study followed a concurrent triangulation design in line with the mixed-methods research approach. The purpose of concurrent triangulation design, as noted by Castro et al. (2010), is to utilise both qualitative and quantitative data to define more accurately the relationships among variables of interest. As also noted by Neri and Kroll (2009), the concurrent triangulation design involves a single study that contains qualitative and quantitative data collection, and the data collection is conducted at the same time, with the prime purpose of validating the findings collected from each method with the evidence of data from the other method.

In the concurrent triangulation design, the researcher engages in the collection and analysis of both quantitative and qualitative data during the same phase of the research process and the merging of the two sets of results in the overall interpretation of the results (Teddlie & Tashakkori, 2010). Quantitative and qualitative methods are used in one phase to confirm, cross-validate, or corroborate findings within a single study, with both components considered equally important (Terrell, 2012). As noted by Creswell and Plano Clark (2017), combining both data sets in one study is to obtain

a complete understanding of the problem by obtaining different but complementary data that validate findings. The concurrent triangulation research design becomes useful as a strategy to address research questions demanding that multiple data types be collected simultaneously.

There are some challenges associated with the use of the concurrent triangulation design, and one of them is that the researcher should be competent in drafting research instruments and collecting data for a study's quantitative and qualitative aspects. The researcher worked closely with his supervisor to overcome the challenge, obtaining the necessary advice and guidance. The researcher also attended online Mixed-Methods Research (MMR) webinars, which assisted with a complete understanding of MMR and its designs. Integrating the two data sets may also take time, especially where the two show discrepancies. To solve the challenge, the researcher studied the two data sets closely, identifying areas of congruence and discrepancy and indicating the same at the interpretation stage of the data.

4.4.1.1 Integration of quantitative and qualitative data

Bazeley (2018) noted different ways of integrating quantitative and qualitative data in a mixed-methods concurrent triangulation design. While Creswell and Plano Clark (2017) note that data integration might occur at different stages, such as data collection, data analysis and interpretation, there is always a need to be very clear about the stage and the technique utilised. It is a severe flaw in the execution of a concurrent triangulation design if the data sets are collected, analysed, interpreted, presented and discussed separately in a mixed-methods study (Bazeley, 2018). The preceding view alludes to the fact that the strength of a mixed-method research design is in the explicit integration of data.

In the current study, the quantitative and qualitative data sets were integrated at the analysis and interpretation stage using what Bazeley (2018) terms the juxtaposing technique. In this technique, there is a joint analysis and presentation of the data sets on a particular theme, drawing parallels and discrepancies from the data by comparing quantitative and qualitative data or findings. In section 5.2.2 of the fifth chapter, data on students' understanding of online interaction is presented quantitatively and then qualitatively, and comparisons are drawn. The same pattern is adopted in data

analysis, presentation and interpretation to fulfil all the research objectives in section 1.5.1 of the first chapter. The intention was to identify convergence, divergence, contradictions or relationships between two data sources concerning investigating the distance education students' online interaction experiences. Data integration involves harmoniously and systematically communicating the findings from different methods and is a matter of innovation (Guetterman et al., 2015).

Integrating data sets should be meaningful in allowing the researchers to realise the benefits of mixed methods to produce a holistic understanding of any issue under investigation and not see data as uncoordinated separate parts (Fetters, 2016). Therefore, in the present study, the researcher intentionally brought together qualitative and quantitative results as interdependent components in the research necessary to address common research questions (Bazeley, 2018).

4.4.2 Justification for using the concurrent triangulation design

The researcher utilised the concurrent triangulation research design because the design helps collect quantitative and qualitative data simultaneously without considering which methodology is considered over the other (Bazeley, 2018). The primary purpose was to complement quantitative and qualitative data to understand the issue under investigation fully. The distance education students' online interaction experiences could easily be understood qualitatively by the researcher and also pursued the reasons behind some of the responses, hence the need to simultaneously collect data and integrate it when analysing and interpreting the findings. Through the chosen design, the researcher could address the quantitative and qualitative dimensions of a single research question by collecting data simultaneously.

The concurrent triangulation design was also employed because it enabled the researcher to use separate quantitative and qualitative methods in a single study phase. The study had one phase of data collection, which entailed collecting both qualitative and quantitative data at the same time, and this assisted the researcher in mitigating the weaknesses of one approach with the other (Loo & Lowe, 2011). The current study analysed and merged two data sets at the interpretation phase. At the interpretation stage, agreement and disagreement are noted, informing the conclusions (Creswell, 2014).

The concurrent triangulation design followed in the current study allowed the researcher to collect both qualitative and quantitative data in a one-phase, and this resulted in a shorter data collection period compared to how long it would have taken had other mixed methods research designs been utilised and the relatively shorter time for data collection afforded the researcher ample time to devote to the data analysis and interpretation process by working closely with the two collected data sets.

4.5 POPULATION, SAMPLE AND SAMPLING TECHNIQUES

In line with the mixed-methods approach followed in the present study, in this section, the researcher discusses the population, sample and sampling techniques for the quantitative aspect of the study. The selection of the research participants for the qualitative component is also explained.

4.5.1 Sample and sampling techniques for the quantitative component

According to Young (2016), population is the people or objects the survey investigates. In the current study context, the population was 1815 distance education students studying with the Institute of Distance Education at the University of Eswatini. The population comprised male and female students studying the twelve academic programmes offered at different year levels. Table 4.1 summarises the population size according to gender, the programme of study and year level.

4.5.1.1 Sampling for quantitative component

A sample is a representative sub-group of the population that can be surveyed to draw appropriately about the population (Young, 2016). The researcher utilised the stratified random sampling technique to develop a representative sample. To create a stratified random sample, there are even steps one should follow, and these are defining the population, choosing the relevant stratification, listing the population, listing the population according to the chosen stratification, choosing the sample size, calculating a proportionate stratification and using a simple random or systematic sample to select a sample (Young, 2016). In defining the population, the researcher found that the total number of distance education students at the time of conducting the study was 1815. Regarding the strata, the students were distributed according to the programme of study, level of study and gender, as captured in Table 4.1. Table 4.1 describes the

population from which the representative sample was drawn. The population is described in terms of the programme of study, level of study and gender.

Table 4.1: Population size according to programme, level of study and gender

Programme	Level 1			Level 2			Level 3			Level 4			Total
	F	M	T	F	M	T	F	M	T	F	M	T	Grand total
Bachelor of Arts (Humanities)	55	25	80	30	15	45	20	10	30	10	5	15	170
Bachelor of Commerce	90	65	155	50	30	80	70	50	120	35	30	65	410
Bachelor of Education (Adult Education)	5	0	5	5	0	5	10	5	15	10	5	15	45
Bachelor of Education (Primary)	15	5	20	10	5	15	15	5	20	30	10	40	95
Bachelor of Education (Secondary)	115	40	155	80	25	105	40	25	65	25	10	35	360
Bachelor of Nursing Science	55	20	75	55	20	75							150
Bachelor of Science (Information Technology)	20	60	80	15	40	55							140
Certificate in Psychosocial Support	75	10	85	70	10	80							165
Certificate in Portuguese	5	0	5										5
Diploma in Law	20	15	35	10	5	15	0	5	5				55
Bachelor of Laws (LLB)	15	10	25	10	10	20	10	5	15	20	15	35	95
Postgraduate Certificate in Education	55	30	85										85
Bachelor of Science in Computer Science Education	8	15	23	8	9	17							
Totals	533	295	828	343	169	512	165	105	270	130	75	205	1815

Key: M - Male; F - Female; T - Total

The sampling method utilised was the stratified random sampling technique. As noted by Babbie (2012), stratified random sampling is a probability sampling technique that affords every item in a population an equal chance to be selected to be part of the sample. It is further noted that the population must be divided into different strata in stratified random sampling, and a random sample is drawn from each stratum. The sample size was determined in line with the sampling ratios by Ankrah (2014): for a population size of between 1,000 and 10,000 units, a sampling ratio of 10% is deemed representative enough. Therefore, from the 1815 registered students, 361 were selected for the study, constituting 20% of the population. The researcher targeted 20% of the population as the sample size, given the realisation that questionnaires

administered online had a possibility of a lower return rate due to the respondents' email checking habits, interest and length of the instrument (Silva & Durante, 2014)

Stratification was done by gender, programme of study, and level of study. The proportionate stratification sampling procedure was utilised where the sample size of each stratum was proportionate to the population size of the stratum. The following equation determined strata sample sizes:

$$nh = (Nh/N)*n.$$

nh is the sample size for stratum h

Nh is the population size for stratum h

N is the total population size

n is the total sample size

Table 4.2 shows the description of the sample, which was selected from the population of 20% using a stratified random sampling technique. The population is described in terms of the programme of study, level of study and gender.

Table 4.2: Sample size according to programme, level of study and gender

Programme	Level 1			Level 2			Level 3			Level 4			Total
	F	M	T	F	M	T	F	M	T	F	M	T	Grand total
Bachelor of Arts (Humanities)	11	5	16	6	3	9	4	2	6	2	1	3	34
Bachelor of Commerce	16	13	29	10	6	16	14	10	24	7	6	13	82
Bachelor of Education (Adult Education)	1	0	1	1	0	1	2	1	3	2	1	3	8
Bachelor of Education (Primary)	3	1	4	2	1	3	3	1	4	6	2	8	19
Bachelor of Education (Secondary)	23	8	31	16	5	21	8	5	12	5	2	7	71
Bachelor of Nursing Science	11	4	15	11	4	15							30
Bachelor of Science (Information Technology)	4	12	16	3	8	11							27

Certificate in Psychosocial Support	15	2	17	14	2	16							33
Certificate in Portuguese	1	0	1										1
Diploma in Law	4	3	7	2	1	3	0	1	1				11
Bachelor of Laws (LLB)	3	2	5	2	2	4	2	1	3	4	3	7	19
Postgraduate Certificate in Education	11	6	17										17
Bachelor of Science in Computer Science Education	2	3	5	2	2	4							9
Totals	105	59	164	69	34	103	33	20	53	26	15	41	361

Key: F = Female; M = Male; T = Total

The sample size of 361 students was deemed appropriate, and as Faber and Fonseca (2014) note for generalisability, a sample size should be at least the ideal 10%.

4.5.2 Selection of research participants for the qualitative component

The selection of participants for the focus group discussion was done using the purposive sampling technique. Purposeful sampling is a technique utilised in qualitative research to target and select information-rich sources, and these are individuals or groups of individuals who are deemed to be knowledgeable about or experienced in the issue under investigation (Creswell & Plano Clark, 2017). The selected participants were considered to have first-hand experience of the phenomenon of interest. A purposive sampling procedure was followed to select relevant participants. Purposive sampling involves selecting information-rich cases (Patton, 2015). Participants in this sample were assumed to be directly involved in online learning. They had direct experience in online learning, hence willing to share their views and experiences on interaction in online learning.

The sample set in this study, comprised 40 distance education students, 10 in each focus group, and these participated in the study. The participants were selected based on their experience in online learning. The qualitative sample set, was involved in a

focus group discussion to understand the participant's experiences of online interaction. The inclusion criteria for the participants selected for FGDs included the following:

- Students in levels two, three and level four.
- Students from the most active courses on the Moodle LMS
- Students in four academic programmes: Bachelor of Science in Information Technology, Bachelor of Science in Computer Science Education, Bachelor of Primary Education and Bachelor of Secondary Education.
- Students with at least two years of experience in online learning.

The researcher worked with the course instructors to identify the ten most active students online per programme per level in the four identified academic programmes, and such students were drawn from courses active on the Moodle LMS.

4.6 DATA COLLECTION INSTRUMENTS

The issue of research instruments is linked to the concept of 'research data', which, according to Baral (2017), is the collection of the required facts for research. Research data should be carefully collected to fulfil the objectives of a study. Data collection instruments are the tools utilised to collect data in answer to the research questions. In this section, the researcher discusses the two research instruments employed in the present study: a structured questionnaire and a focus group discussion.

4.6.1 Structured questionnaire

As a data collection instrument, a questionnaire is a list of questions to be answered by a group of people to obtain facts or information about their views on a specific issue (Myneni, 2014). Researchers may utilise the questionnaire method to collect structured and unstructured data from the respondents in a standardised way, and numerical data may be collected and analysed using statistical techniques (Taherdoost, 2016). Similarly, questionnaires are any text-based instrument that provides the respondents with carefully selected questions or statements to respond to (Young, 2016).

The advantages of a questionnaire are numerous, and one of them is that it allows data to be collected from large sample sizes with relative ease (Jones et al., 2013). In the current study, the researcher utilised a structured questionnaire to collect data from

more than three hundred students in a relatively short time; hence, the advantage of utilising the questionnaire was experienced by the researcher.

As noted by Cohen et al. (2017), one of the advantages of a questionnaire is that it involves a low cost in collecting data from a larger sample size. In the current study, the researcher administered the questionnaire online and collected information from more than three hundred students with minimal costs. Such an approach assisted the researcher as the research project was not funded, and the researcher utilised his resources in the data collection and other aspects of the study.

There is one major limitation of the questionnaire, which the researcher was aware of and attended to. The wording of the questionnaire in terms of language and terminology should be so precise that the respondent would understand and respond accordingly as there would be no one to explain where the respondent fails to understand (Kumar (2019) is the absence of individuals who make clear the meaning of questions to respondents. Thus, it is recommended that questions be straightforward to understand. To address this issue, the researcher designed the questionnaire by writing it in simple and comprehensible language for easy understanding by the respondents. Furthermore, the researcher attended to the validity aspects discussed in section 4.9.1 of this chapter.

4.6.2 Focus group discussion

Focus groups are perceived as a form of group interview in which a limited number of people convene to deliberate on one or more relevant topics (Gundumogula, 2020). Similarly, Collins and O'Brien (2003, p.142) argues that a focus group is a group interview on a particular topic, 'led by a trained moderator ... the goal of the focus group is to provide valuable insights on the topic.' In the current study, the researcher sought to lead the participants into a reflection on their online interaction experiences, to bring out the nature, extent and benefits of the experiences and, in the process, generate deeper and richer insights through social interaction with the participants (Gundumogula, 2020).

The online focus group discussion was the type of FGD employed, and it involves two types: synchronous, through video-conferencing platforms or asynchronous, through

text-based means such as chats and emails (Moore et al., 2015). The synchronous type was utilised, and discussions were conducted through the Zoom platform. The advantage of online FGD is that the participants are free to contribute to the discussion anonymously without fearing victimisation or judgment (Daniels et al., 2019). In ensuring the confidentiality and anonymity of data provided during an FGD, the participants may use confidential pseudonyms and contribute to the discussion with their videos switched off.

The main limitation of an FGD is that it may lead to bias and manipulation through the over-dominating participants (Collard & van Teijlingen, 2016). Being wary of this challenge, the researcher distributed the questions fairly and allowed all the participants to contribute to a question without coercion. To allow all the participants to contribute, the researcher laid ground rules, which included respect for the contributions of others and that no response would be treated as right or wrong.

4.7 DATA COLLECTION PROCEDURE

The data collection processes for quantitative and qualitative data are explained in this section.

4.7.1 Quantitative data collection

As noted in section 4.6.1, quantitative data were collected through a structured questionnaire. In this section, the researcher discusses the questionnaire construction and administration processes.

4.7.1.1 Construction and structure of the questionnaire

For the quantitative component of this mixed-methods study, quantitative data were collected through a structured questionnaire. The questionnaire utilised in the study is shown in Appendix E. A questionnaire should be designed so that the selected question items assist in answering the research questions (Youngshin et al., 2015). In designing the questionnaire, the researcher included two sections: one on the biographical details of the respondents and another one consisting of six sub-sections covering the five research objectives and each sub-section contained about ten items, all on different aspects of online interaction.

4.7.1.2 Distribution and collection of the questionnaire

The researcher utilised Google Forms to administer the questionnaire online. The electronically administered questionnaires make sending and responding to the instrument easy and cost-effective (Nayak & Narayan, 2019). The researcher sent a link to the questionnaire to the email addresses of respondents selected as the sample, and they anonymously completed the questionnaire online. Electronic consent was sought from the respondents, who clicked 'Yes' to confirm consent and were allowed to proceed to complete the questionnaire. In instances where the respondent did not consent, the system would not allow them to proceed with completing the questionnaire. Each respondent had to respond only once to the questionnaire on Google Forms. The electronic administration of the questionnaire guaranteed researcher detachment in the data collection process, which reduced personal bias (Savela, 2018).

Responding to the questionnaire electronically made it possible for the respondents to use any browser, and they could utilise browsers on any electronic device. Upon receiving the email link to the questionnaire, the respondents could respond and submit the questionnaire electronically. Anonymity was further guaranteed by the deactivation of the Google Form 'Collect email addresses' function. A deliberate attempt was made not to link any questionnaire responses to any respondents; hence, they were not required to write their email addresses or names anywhere on the form.

The questionnaire items in subsections 1 to 4 had items on a 4-point rating scale, ranging from 4 to 1 as follows: Strongly Agree (SA) was 4 points, Agree (A) was 3 points, Disagree D was 2 points, and Strongly Disagree (SD) was 1 point. The respondents were also required to tick against the options that reflected their opinions about particular issues on online interaction. In sub-section 5, the respondents indicated 'always', 'sometimes' or 'never' on the pedagogical approach utilised to promote interaction in online learning. The acceptance of responses to the questionnaire on Google Forms was set for three weeks, and the setting was disabled after that to begin data analysis.

4.7.2 Qualitative data collection

In this section, the researcher discusses the data collection process for qualitative data collected through the FGD.

4.7.2.1 Construction and structure of the FGD schedule

The online FGD were conducted using a FGD schedule shown in Appendix F. The FGD schedule contained two sections. The first section sought to collect some demographic data about gender, the experience of studying online, the programme studied, and the duration of stay at the university. This was meant to build some understanding of the FGD participants. The second section of the schedule contained five subsections aligned with the study's research objectives, and all the questions were open-ended and meant to elicit discussion.

4.7.2.2 Administration of the FGD

The first determination was on the size of the FGD. There are different viewpoints on the size of a focus group that would be meaningfully engaged in a discussion that would yield the required insights on a research topic. According to Krueger (1994), a focus group comprises between three and twelve participants, whereas Boddy (2005) notes a size of between four to five participants and Masadeh (2012) states that a focus group may have between six to twelve participants. Of importance here is the observation that studies need to be more conclusive on how large a focus group should be. In this view, the researcher used ten participants, which was within the limits proposed by Masadeh (2012). Studies must also be more conclusive on the recommended number of focus groups necessary for the researcher to work with before reaching data saturation (Guest et al., 2017). To this end, the researcher chose to have four focus groups. The administering of the FGDs followed a well-thought-out process, as shown in Figure 4.2.

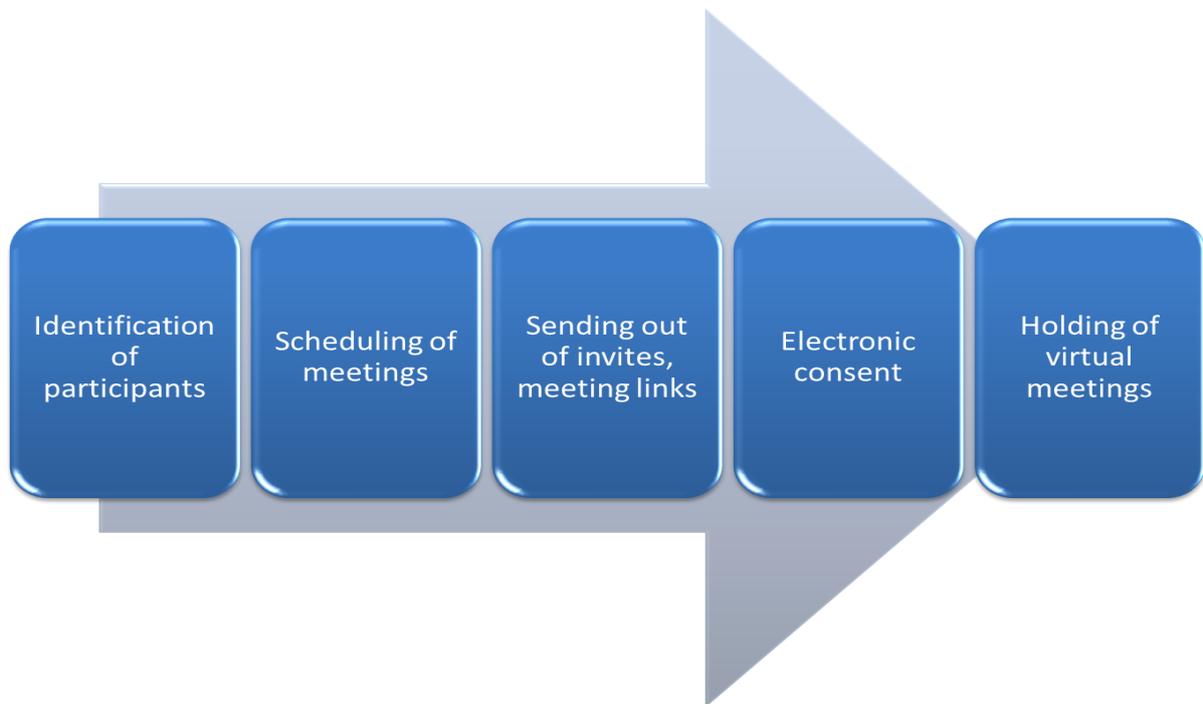


Figure 4.2: Focus Group Discussion administration process (Researcher's own)

The process commenced with identifying the FGD participants, which was done in line with the selection and inclusion criteria detailed in section 4.5.2 of this chapter. Once the ten participants per FGD group were identified, virtual meetings were scheduled, and invites were extended to the participants, together with meeting links and details for participation. Electronic consent was sought just before the virtual meeting, and the virtual meetings were conducted, each lasting one and a half hours.

In the actual conducting of the focus group discussions, the researcher was the meeting host and moderator who started by explaining the purpose of the meeting and the netiquette, such as switching off the microphones when off stage, raising hands to speak and using the chat facility to type in comments. The moderator and the participants could hear each other with the help of microphones. The participants did not respond to questions in any order, but they were timed, and where possible, follow-up questions were asked to probe the participants. The researcher also sought and was granted consent by the participants to audio-record the FGD proceedings.

4.7.3 Alignment of research instruments to research objectives

The proper alignment of the research questions, objectives, unit of analysis, research instruments and nature of data collected was considered necessary to ensure that the data collection instruments would gather the required data to answer the study's research objectives. Such alignment was also deemed necessary in keeping the focus of the study within the desired approach and strategy. Table 4.3 shows the alignment of research questions, objectives, unit of analysis, research instruments, and nature of data.

Table 4.3: Alignment of research questions, objectives, unit of analysis, instruments and nature of data

Research Question	Research Objectives	Unit of analysis	Research instrument	Nature of Data
1. How do students understand interaction in online learning?	1. Ascertain students' understanding of interaction in online learning.	Distance education students	Questionnaire Focus Group Discussion	QUAN QUAL
2. What benefits do students derive from interaction in online learning?	2. Establish the benefits students derive from interaction in online learning.	Distance Education students	Questionnaire Focus Group Discussion	QUAN QUAL
3. How are students trained and supported for interaction in online learning?	3. Find out how students are trained and supported for interaction in online learning.	Distance Education students	Questionnaire Focus Group Discussion	QUAN QUAL
4. What factors promote or hinder interaction in online learning at the rural-based university?	4. Identify factors that promote or hinder interaction in online learning at the rural-based university.	Distance Education students	Questionnaire Focus Group Discussion	QUAN QUAL
5. What are the implications for online pedagogy at the rural-based university?	5. Assess the implications for online pedagogy at the rural-based university	Distance Education students	Questionnaire Focus Group Discussion	QUAN QUAL

4.8 DATA ANALYSIS

In this section, the researcher discusses how the collected data were analysed. The data analysis techniques and processes for the quantitative and the qualitative data are discussed, starting with quantitative data analysis.

4.8.1 Quantitative data analysis

A summary of the responses from the respondents to the questionnaire was accessed from Google Forms. The responses were then downloaded as an Excel Sheet and exported to the SPSS for statistical analysis version 28, such as cross-tabulations. In order to aid data analysis, the SPSS was utilised. Descriptive statistics were used to report the survey findings, and the mean and standard deviation values were used to answer the research questions. The questionnaire had the following response options: Strongly Agree = 4 points; Agree = 3 points; Disagree = 2 points; Strongly Disagree = 1 point. The criterion mean for the questionnaire was 2.50, while the criterion percentage for the checklist was 50%. Any item with a mean of 2.50 and above or a percentage of 50% was accepted as representing 'Strongly Agree' or 'Agree'. In comparison, any item with a percentage or mean score less than 50% or 2.50 was not accepted as they represented 'Strongly disagree' or 'disagree.'

Decision Rule

If the mean score was 2.50 and above, it was accepted as representing 'Strongly Agree' or 'Agree'. The mean would mean that the item was considered to have a positive level of agreement with the specific aspect of online interaction. Items with a mean score of less than 2.50 were not accepted as they represented 'Strongly disagree' or 'disagree'; the mean was interpreted to mean a negative level of agreement with the given aspect of online interaction.

4.8.2 Qualitative data analysis

The thematic content analysis technique was utilised to analyse qualitative data from the FGDs. Thematic content analysis is a qualitative data analysis method that involves identifying, analysing, organising, describing, and reporting the common and prevalent themes in a data set (Nowell et al., 2017). In the thematic content analysis technique, qualitative data are presented descriptively after the researcher familiarises himself or herself with data to identify patterns and themes (Vaismoradi & Snelgrove, 2019).

The first step in the thematic content analysis technique is transcribing the data from oral interviews into text that can be studied to identify patterns (Erlingsson &

Brysiewicz, 2017). The primary purpose of identifying patterns would be to establish the central ideas or points expressed by the participants on a particular issue under investigation. The process followed in thematic content analysis is reflective and reflexive as it involves reading and re-reading transcripts, and the process may not follow a simple linear progression of activities (Erlingsson & Brysiewicz, 2017)

Figure 4.3 summarises the thematic content analysis process.

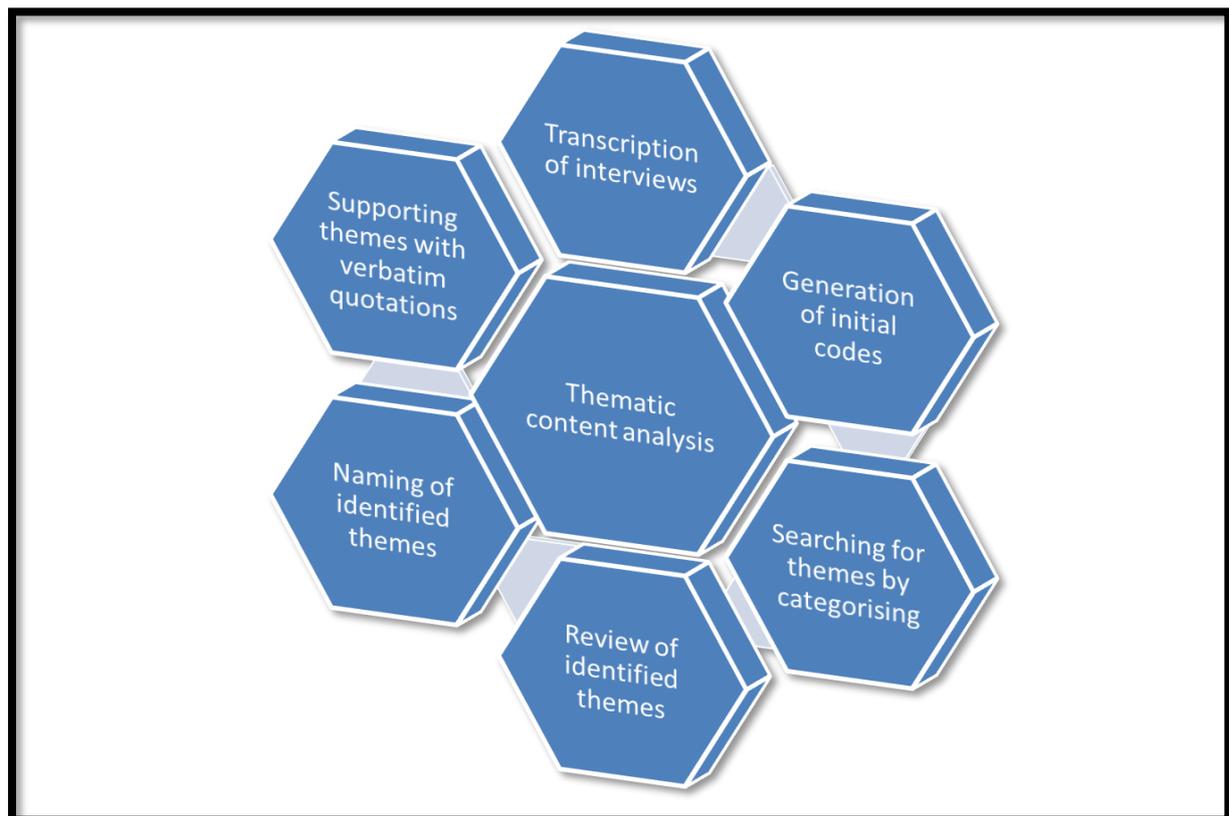


Figure 4.3: Thematic content analysis process (Adapted from Dube & Shawe, 2022, p. 155).

The thematic content analysis technique utilised in analysing data from the Focus Group Discussions in the current study followed the steps, as informed by Dube and Shawe (2022), which included the transcription of the interviews, generation of initial codes, searching for themes by categorisation, review of the identified themes, defining and naming the identified themes as well as supporting themes with verbatim quotations in the write-up. Qualitative data processing involves a meticulous and rigorous exercise consistent with the thematic content analysis approach, as shown in the above steps.

4.9 QUALITY ENHANCEMENT FOR THE STUDY

In this section, the researcher discusses the quality assurance measures for the study, which are issues such as validity and reliability for the quantitative aspect of the study and data trustworthiness for the qualitative aspect. The measures are discussed to ensure the study's validity, reliability, and data trustworthiness.

4.9.1 Validity

Validity in quantitative research is about how well a measuring instrument performs its function and is concerned with fitness for purpose, whether the measuring instrument measures what it is intended to measure (Sürücü & Maslakçı, 2020). Similarly, Whiston (2012) notes that validity entails obtaining data appropriate for the intended use of the measuring instruments. A research instrument should measure what it is designed to be regarded as valid or truthful in correctly measuring the intended concepts (Pallant, 2011). Content validity is regarded as the qualitative component of validity, and it is concerned with the extent to which each item in the measuring instrument serves the purpose and is carefully constructed to measure the intended phenomenon (Sürücü & Maslakçı, 2020).

Several measures may be utilised to ensure the validity of the research instruments. Expert opinion may be sought to address content validity as an expert in an area interrogates the measuring instrument in terms of how it addresses fundamental concepts of the issue under investigation and how accurately the items are expressed (Oluwatayo, 2012). In the current study, the two research instruments were sent to an expert in online learning who provided comments on the content validity of the research instruments.

Face validity is concerned with how the measuring instrument looks valid at face value, and this is based on the researcher's feelings, thoughts, and intuition about the functioning of the measuring instrument (Kaplan & Saccuzzo, 2017). Face validity is also known as 'surface validity' and is considered a very subjective and superficial method of measuring validity (Whiston, 2012). Opinion was sought from an expert in online teaching and learning who looked at issues such as the appropriateness of the items in instruments, clarity of statements in the scales, readability of all items in

instruments, the attractiveness of the instruments as well as the appropriateness of the items to the level of the respondents and participants.

4.9.2 Reliability

Reliability refers to research or measuring instrument that provides consistent results with equal values as it measures the research's consistency, precision, repeatability, and trustworthiness (Mohajan. 2017). Similarly, Noble and Smith (2015) define reliability as the degree of consistency or accuracy with which an instrument measures the attribute it is designed to measure. It means that a study is deemed reliable if the same results are obtained when the study is replicated under similar conditions. Reliability, therefore, is the consistency of measurement or stability of measurement under similar conditions and is vital to ensure that the data collection instrument passes reliability tests to generate reliable results for a study. In the present study, several measures were employed to ensure the reliability of the questionnaire: pilot testing and tests such as test-retest reliability, inter-rater reliability, and internal consistency reliability. In this study, the researcher employed two measures for internal consistency test through the calculation of Cronbach's alpha coefficient and pilot testing.

4.9.2.1 Internal consistency reliability

The Cronbach's alpha coefficient was calculated to measure the internal consistency reliability of the different sections of the structured questionnaire administered to distance education students. Internal consistency of a research instrument shows the degree to which the question items in the assessment instrument would generate dependable scores or are correlated (Tang et al., 2014). As a calculated test score, Cronbach's alpha shows reliability by indicating the difference between the true and the observed score (Barbera et al., 2020). The Cronbach's alpha coefficient is generally indicated as a number between 0 and 1, and the recommended standard of an internally consistent instrument has values ranging from 0.70 to 0.95 (Taber, 2018). The categories of Cronbach's alpha reliability values acceptable in determining the internal consistency of an instrument are as follows: 0.9 = excellent, 0.8 = good, 0.7 = acceptable, 0.6 = questionable, and 0.5 = poor or unacceptable (Tavakol & Dennick, 2011). In the current study, the researcher used a four-point Likert scale. The questionnaire items were in five sections: students' understanding of interaction in

online learning, benefits students derive from interaction in online learning, training and support of students for interaction in online learning, factors that promote or hinder interaction in online learning and implications for online pedagogy. The consistency of the items to each other was determined by calculating Cronbach's alpha coefficient (Barbera et al., 2020). In other words, the coefficient alpha means a correlation prediction between two samples drawn randomly from the total items.

In the current study, there were five themes to examine students' experiences of online interaction. Cronbach's alpha was calculated using the SPSS for each theme or section of the questionnaire for teachers and students. Pilot study responses were used to measure the internal consistency based on the number of items per theme, as illustrated in Table 4.4

Table 4.4: Cronbach's alpha reliability of internal consistency for Likert-scale sections

Section	Themes	Type of respondents	Cronbach's Alpha	Number of items
1	Students' understanding of interaction in online learning	Distance education students	0.9	10
2	Benefits students derive from interaction in online learning	Distance education students	0.8	10
3	Training and support are offered to students for interaction in online learning.	Distance education students	0.9	10
4	Factors that promote or hinder interaction in online learning at the rural-based university.	Distance education students	0.7	10
5	Implications for online pedagogy at the rural-based university.	Distance education students	0.8	11

Sections 1 and 3 of the questionnaire had an excellent Cronbach's alpha reliability value of 0.9, while sections 2 and 5 had a good reliability value of 0.8. Only section 4 had an acceptable reliability value of 0.7. The values ensured that the researcher

collected valid and credible data. Overall, the questionnaire was considered reliable in collecting data for the quantitative component of the study.

4.9.3 Data trustworthiness

Whilst the quantitative side of the study addressed validity and reliability, the qualitative one dealt with data trustworthiness. In establishing data trustworthiness, the qualitative researchers would ask whether the study's findings can be trusted (Lincoln & Guba, 1985). The criteria for ascertaining data trustworthiness comprises four elements: credibility, dependability, confirmability, and transferability (Lincoln & Guba, 1985).

4.9.3.1 Credibility

Credibility in qualitative research is concerned with the truth value of a study, which entails the confidence associated with the truth of the research findings (Lincoln & Guba, 1985). The issue of credibility also establishes the veracity of the information drawn from the research participants by interpreting the original views correctly (Korstjens & Moser, 2018). As further noted by Anney (2014), credibility in qualitative research is concerned with the plausibility of research findings as correctly representing the views of the research participants. The researcher may employ various strategies such as reflexivity, prolonged and varied field experience, pilot study, triangulation, member checking, peer examination and frequent debriefing to enhance the credibility of a study (Korstjens & Moser, 2018). In the current study, the researcher utilised a pilot study to fine-tune the research instrument to enhance the credibility of the results. The researcher also employed the member-checking strategy. The FGD participants were asked to check the discussion transcripts for accuracy. In this study, the credibility triangulation strategy was effected using distance education students as informants who provided data on online interaction experiences. There was also triangulation of FGD responses and responses from the questionnaire.

4.9.3.2 Transferability

Transferability refers to the degree to which the results of qualitative research can be transferred to other contexts or settings with other participants under similar conditions (Lincoln & Guba, 1985). Through vivid descriptions of the research context and thick

descriptions, the researcher enhances transferability, considered the interpretive equivalent of generalisability (Anney, 2014). In the case of the current study, the researcher clearly described the research context, including the research participants, and the data reporting utilised thick descriptions using verbatim quotations of the participants to support the identified themes as strategies to ensure the transferability of findings. The researcher described the distance education students' interaction experiences in online learning. The criteria used to select research participants for the focus group interview were detailed in section 4.5.2.

4.9.3.3 Dependability

In some way, dependability is closely linked to credibility and is concerned with the stability of findings over time. It involves the participants' evaluation of the findings, interpretation and recommendations of the study to ascertain that the findings are supported by the data received from participants (Lincoln & Guba, 1985). Several measures could be employed to enhance the dependability of a qualitative study, including keeping an audit trail and ensuring that the processes are reported in detail to allow other researchers to replicate the study (Anney, 2014). In the current study, the researcher ensured the dependability of findings by detailing the research process, especially the data collection procedure. An audit trail of the research process was kept by documenting all aspects of the study.

4.9.3.4 Confirmability

Confirmability is the degree to which other researchers could confirm the findings of a qualitative study as it is premised on establishing that data and interpretations of the findings are derived from the data collected and not a manipulation of the researcher (Lincoln & Guba, 1985). Several measures may be utilised to enhance confirmability, which can be achieved through an audit trail, reflexive journal and triangulation (Korstjens & Moser, 2018). In enhancing confirmability in the current research, the researcher kept an audit trail of the research process by maintaining a log of all the research activities. The data analysis process entailed a great deal of reflexivity, which allowed the researcher to deal with personal biases and allow findings to be based on information provided by the participants.

4.9.4 Pilot testing of the research instruments

Before the primary data collection exercise, the researcher piloted the instruments to ascertain their validity and reliability. A pilot study is considered a miniature study, meant to pre-test or try out research instruments at a lower scale to ascertain the practical implementation's usability and assess the main study's practicalities concerning its final implementation (Malmqvist et al., 2019). In the current study, the pilot study was conducted to assist the researcher in refining the instruments before the primary data collection exercise.

The pilot study was conducted with 20 students not part of the study sample. The students were asked to complete the questionnaire in 50 minutes. Most of the questions appeared clear and easy to comprehend for the pilot study respondents. However, some issues were attended to, as shown in Table 4.5. Furthermore, the FGD schedule was piloted on five participants not part of the study sample. The participants could respond to the questions, but some schedule aspects were addressed, as shown in Tables 4.5 and 4.6.

Table 4.5: Improvements on the questionnaire after the pilot study

Questionnaire section	The nature of correction effected	Item before pilot exercise	Item improvement after the pilot exercise
Section A: Personal Information	Uniformity in the age range	No uniformity in age ranges	There was uniformity in maintaining a four-year age range
	Additional option for gender	Included Male and Female only	Included 'Other'
Section B1: Students' understanding of interaction in online learning	Uniformity of rating scales	Utilised a five-point Likert scale	Reduced the Likert scale to four: Strongly Agree (SA), Agree (A), Disagree (D), Strongly Disagree (SD)
	Content coverage	Initially, the section had seven items	Added three more items
	Word replacement	Had used the word 'navigate' in item 7	Replaced the word with the phrase 'move around within.'
	Word replacement	Had used the word 'laptop' in item 8	Replaced the word with 'device'
Section B2: Benefits students derive from interaction in online learning	Uniformity of rating scales	Used five-point Likert scale	Reduced the Likert scale to four: Strongly Agree (SA), Agree (A), Disagree (D), Strongly Disagree (SD)
	Uniformity in terms used	The terms course instructor and course facilitator were used interchangeably in items 4 and 8.	Used the term course instructor consistently
Section B3: Training and support of students for interaction in online learning	Consistency of rating scales	Used five-point Likert scale	Reduced the Likert scale to four: Strongly Agree (SA), Agree (A), Disagree (D), Strongly Disagree (SD)
	Adding a term	In item 1, the term "Moodle" had been omitted before LMS	Added the term "Moodle" to read "Moodle LMS."
	Spelling error corrected	Questionnaire item 1 had the wrong spelling of 'interactive' instead of 'interactive.'	The spelling error was corrected.
	Removal of a technical term	Removed the open educational resources (OERs) in item 5	The question item used the term free educational resources.
Section B4: Factors that promote or hinder interaction in online learning	Uniformity of rating scales	Used five-point Likert scale	Reduced the Likert scale to four: Strongly Agree (SA), Agree (A), Disagree (D), Strongly Disagree (SD)
	Addition of equivalent term	Questionnaire items 1, 4, 11 and 14 had 'facilitators' only and 'instructors' was added	Adjusted question items to include two terms 'facilitators/instructors'
	Addition of equivalent term	Questionnaire item 5 had the term 'devices' only, and 'gadgets' was added	Adjusted question items to include two terms 'devices/gadgets'
Section B5: Implications for online pedagogy	Consistency of rating scales	Used five-point Likert scale	Reduced the Likert scale to four: Strongly Agree (SA), Agree (A), Disagree (D), Strongly Disagree (SD)
	Added phrase at the end of a statement	On the last item, there was no example of a video conferencing platform	The item has 'such as Zoom' added

The contents in Table 4.5 make it evident that the pilot exercise helped to make some modifications to the questionnaire. Before the questionnaire was used in the main study, issues identified during the pilot exercise were considered and corrected. The FGD schedule was subjected to the same procedures shown in Table 4.6.

Table 4.6: Improvements on the FGD schedule after the pilot study

FGD Schedule section	The nature of correction effected	Item before pilot exercise	Item improvement after the pilot exercise
Section A: Demographic Data	Addition of item	There was no item seeking to find experience in LMS use	This question item was added: "How long have you been studying online?"
Study Guiding Research Question 1: How do students understand online learning interaction?	Addition of item	There was no term 'engagement.'	The term 'engagement' was added in interrogating the understanding of interaction.
	Content coverage	Initially, the section had five items	Added three more items to cover the scope
Study Guiding Research Question 2: What benefits do students derive from online learning interaction?	Addition of items	There were no benefits from interacting with devices/gadgets or interacting on social media platforms.	Added the two items
	Uniformity in terms used	The terms course instructor and course facilitator were used interchangeably.	Used the term course instructor/facilitator
Study Guiding Research Question 3: How are students trained and supported for interaction in online learning?	Adding a term	There was no 'Moodle' before LMS in the second question	The term 'Moodle' was added
	Added a phrase	There was no phrase 'free educational resources.'	Added the phrase 'free educational resources' before OER.
Study Guiding Research Question 4: What factors promote or hinder interaction in online learning at the rural-based university?	Rephrasing the main question	The question was too technical.	The question was rephrased as 'How do the following elements affect how you interact in an online course?'
Study Guiding Research Question 5: What are the Implications for online pedagogy at a rural-based university?	No changes have been made to this question.		

As shown in Table 4.6, the pilot exercise was helpful, resulting in some adjustments to the FGD schedule before it was utilised in the main study.

4.10 ETHICAL CONSIDERATIONS

Ethics generally refers to rules or a system of moral principles distinguishing right from wrong. It defines the norms of conduct that distinguish acceptable and unacceptable behaviours (Haque et al., 2022). In linking general ethics to research, Simelane-Mnisi (2018) notes that ethics entails the researcher taking moral responsibility in treating research participants. It is also a standard practice that any research activity that includes human participants or animals should obtain clearance and approval from an institutional ethical review committee before it is conducted (Banks et al., 2013). It is essential to consider different ethical issues when conducting a study. In this section, the researcher discusses how different issues, such as ethical clearance, informed consent, anonymity and confidentiality, were attended to.

4.10.1 Research permission

The World Health Organization (2011) notes that research institutions should work with research and ethics committees that approve research studies based on the ethical acceptability of the research in terms of assessment of potential benefits and the minimisation of the risks, as well as the informed consent procedures. In fulfilling the research approval requirement, the researcher submitted a research clearance application to the University of South Africa (UNISA) College of Education Ethics Review Committee. The application was assessed, leading to the ethical clearance certificate issued in Appendix C. The researcher also sought ethical clearance from the University of Eswatini (UNESWA) and permission to conduct research in the institution from the university authorities. The UNESWA research permission letter and ethical clearance certificate are shown on Appendices B and D, respectively.

4.10.2 Informed consent

Informed consent is regarded as an essential component of research ethics as it is concerned with ensuring that participants engage in a research activity voluntarily, with a complete understanding of the conditions of their participation, and that they provide explicit agreement to participate (Xu et al., 2020). The issue of informed consent in research is also vital in fulfilling the research principles of respect, beneficence and justice (Miller, 2016). Through informed consent, a participant makes an informed decision about participation in the study. Informed consent in the current study was

sought at two levels. The researcher designed an informed consent form, which was provided to the participants, and they signed to accede to participating in the study with no conditions tied to their participation in both the online questionnaire and the focus group discussion. Furthermore, for the Google Forms questionnaire, a consent section was included in the electronic questionnaire. The first section of Google Forms describes the study and its purpose. The section also informed respondents that participation was voluntary and assured them confidentiality and anonymity before they clicked on whether they agreed to participate. Only the respondents who provided positive confirmation of consent completed the questionnaire. Informed consent was also sought before the participants participated in focus group discussions.

4.10.3 Anonymity and Confidentiality

Confidentiality and anonymity are ethical practices meant to protect the privacy of the research participants when collecting, analysing, and reporting data (Coffelt, 2017). In confidentiality, the researcher should engage in deliberate efforts to ensure that there are no identifying features of the participants associated with the data collected. In contrast, in managing anonymity, the researcher should collect data without obtaining the participants' personal information (Coffelt, 2017). The researcher undertook the current study by adhering to the non-disclosure of the participants' information (Wiles et al., 2008). The research information was kept hidden from everyone except the researcher (Saunders et al., 2015). The respondents to the online questionnaire were requested to respond anonymously, and their responses were treated in strict confidence. The Google Forms 'Collect email addresses' function was deactivated to ensure the anonymity of the respondents. The FGD participants participated anonymously, and pseudonyms were used to link responses to the participants. Therefore, no data supplied by the participants could be traced to the individual students.

4.10.4 Voluntary participation and withdrawal

The issues of voluntary participation and withdrawal are linked to informed consent and the negotiation of research relationships (Melham et al., 2014). One of the conditions under which research participants accede to participate in a research activity is to do so voluntarily and withdraw from participation at any stage and for any reason. In the current study, the participants participated freely, without coercion. As

research participants accede to a study, it must be clear that they do so voluntarily and will be free to withdraw from the study at any stage and for any reason. In obtaining informed consent from the participants, the researcher stated explicitly on the informed consent form that their participation was voluntary and that they were free to withdraw from the study at any point.

4.10.5 Harm to the study participants

It is an essential ethical consideration for the researcher to protect the participants' welfare and physical and emotional well-being (Favaretto et al., 2020). The research process should not inflict any form of harm on the participants. Harm includes any form of discomfort, including physical or emotional harm (Favaretto et al., 2020). The current study was on students' online learning interaction experiences, and the content of the study did not expose the respondents to any form of harm. The process of collecting data through an online questionnaire and FGDs did not cause any form of harm to the research participants in any way.

4.11 CONCLUSION

In this chapter, the researcher discussed the methodological processes and procedures for the study. The post-positivist research paradigm in which the study was located was discussed and justified, clearly showing the research's epistemological, ontological and axiological assumptions, influencing the mixed methods research approach. The desire to combine quantitative and qualitative research methods in a single study was justified adequately in attempting to obtain a holistic understanding of the phenomenon of online interaction experienced by distance education students. As an appropriate mixed methods research design for the study, the concurrent triangulation design was discussed and justified, showing clearly that qualitative and quantitative data sets were collected concurrently in a single phase and merged at the analysis and interpretation stage. The data collection instruments utilised in the study, namely the semi-structured questionnaire and the FGDs, were also discussed and justified. In this section, the sample and sampling procedures were also discussed. The data analysis methods, as well as validity, reliability and data trustworthiness, as well as ethical issues, were discussed. In the next chapter, the researcher presents analyses, interprets and discusses the results.

CHAPTER FIVE

DATA PRESENTATION AND ANALYSIS

5.1 INTRODUCTION

This study aimed to explore the online interaction experiences of distance education students in a rural-based university in Eswatini. The study was guided by five objectives, which were to ascertain students' understanding of interaction in online learning, establish the benefits students derived from interaction in online learning, find out how students were trained and supported for interaction in online learning, identify factors that promoted or hindered interaction in online learning at the rural-based university and to assess the implications for online pedagogy at the rural-based university. As a contribution to new knowledge in online learning theory and practice, the study also sought to propose a framework for effective online pedagogy in developing contexts. The study objectives are captured in section 1.5.1 of the first chapter.

In the previous chapter, the methodological processes and procedures were discussed. The research paradigm in which the study is located was explained and justified, followed by the research approach and design. The chapter also explained, in detail, the research methods by addressing the research instrument, sampling, data analysis, validity, reliability and ethical issues.

A structured questionnaire was administered to selected students. The questionnaire had two sections. Section A covered the biographical variables of the respondents. Section B of the questionnaire contained question items focussing on the different aspects of interaction in online learning, such as understanding of the concept, benefits of interaction, training and support in interaction, factors supporting or hindering interactions, and pedagogical implications. Each section contained at least ten items. Three hundred sixty-one (361) questionnaires were administered to the students online using Google Forms, and 338 of the 361 were completed and submitted. This questionnaire had an impressive 94% return rate, exceeding the 50% threshold deemed acceptable for online-administered surveys (Fan & Yan, 2010). The convenience of the online administration for students, who could access the questionnaire online using their mobile devices, contributed to the high return rate in

this study. A virtual FDG was also conducted with four groups of ten students using the FDG schedule in Appendix F. Results regarding the respondents' and participants' biographical information are shown in the next section.

5.2 BIOGRAPHICAL CHARACTERISTICS OF THE QUESTIONNAIRE RESPONDENTS

In this section, the biographical details of the questionnaire respondents to gain a complete understanding of the unit of analysis or the entity under study. Table 5.1 presents the biographical characteristics of the questionnaire respondents.

Table 5.1: Distribution of biographical characteristics of the questionnaire respondents (N=338)

Biographical variable	Variable description	Frequency	Percentage (%)
Gender	Male	114	33.7
	Female	220	65.1
	I prefer not to say	4	1.2
	Total	338	100
Age (years)	18 – 22	32	9.5
	23 – 27	62	18.3
	28 – 32	83	24.6
	33 – 37	114	33.7
	38 years and above	47	13.9
	Total	338	100
Year of Study	1st Year	95	28.1
	2 nd Year	72	21.3
	3 rd Year	67	19.8
	4 th Year	63	18.6
	5 th year	29	8.6
	6 th year	12	3.6
	Total	338	100
Academic programme	Certificate in Psychosocial Support	32	9.5
	Bachelor of Commerce	47	13.9
	Diploma in Law	19	5.6
	LLB	40	11.8
	B.A. Humanities	31	9.2
	B.Ed Adult Education	15	4.4
	B.Ed Primary	16	4.7

	B.Ed Secondary	58	17.2
	PGCE	19	5.6
	Bachelor of Nursing Science	17	5
	BSc Information Technology	32	9.5
	BSc in Computer Science Education	12	3.6
	Total	338	100

Regarding gender, the majority of the respondents, 65.1% (n=220), were female, and 33.7 (n=114) were male. The gender disparity in the responses was consistent with the population and sample numbers in the frames discussed in Section 4.5 in the previous chapter. The highest number of respondents was from the 33 – 37 age group, 33.7% (n=114), and the lowest was from the 18 – 22 age group, 9.5% (n=32). This distribution in terms of age confirms the long-held view of ODL being for mature working adults. It is also important to note the presence of young people in ODL programmes. On the programme of study, the majority of the respondents were from the Bachelor of Education (Secondary) 17.2% (n=58), followed by the Bachelor of Commerce 13.9% (n=47), and the Certificate in Psychosocial Support 10.8% (n=31). There was no respondent from the Certificate in Portuguese programme, 4.4% (n = 15) from the Bachelor of Education (Adult Education) programme, and 3.6% (n=12) from the BSc in Computer Science Education programme. The number of respondents to the questionnaire was consistent with the stratified random sampling employed, as indicated in the population frame in Table 4.1 in Section 4.5 in the previous chapter. The majority of the respondents were in the first-year group, 28.1% (n=95), and the lowest was in the third-year group. Regarding the population frame discussed in Section 4.5 of the previous chapter, enrolment numbers differed as per year level. The following section describes the FGD participants.

5.3 DESCRIPTION OF FOCUS GROUP DISCUSSION PARTICIPANTS

The participants for the focus group discussions were selected according to the criteria outlined in section 4.5.2 in the fourth chapter. Table 5.2 describes the forty participants in the four Focus Group Discussion groups, Group A to Group D. Codes are used to identify the FGD participants in the four groups.

Table 5.2: Focus Group Discussion participants by gender, age, academic programme and year in university

Participant	Gender	Age in years	Academic Programme	Year in University	LMS used	Years of experience in LMS use
Group A						
FGDA1	Male	28	B. Ed Prim	4th	Moodle	4
FGDA2	Male	34	B. Ed Prim	4th	Moodle	4
FGDA3	Female	36	B. Ed Prim	4th	Moodle	4
FGDA4	Female	29	B. Ed Prim	4th	Moodle	4
FGDA5	Female	22	B. Ed Prim	4th	Moodle	4
FGDA6	Female	25	B. Ed Prim	4th	Moodle	4
FGDA7	Male	36	B. Ed Prim	4th	Moodle	4
FGDA8	Female	33	B. Ed Prim	4th	Moodle	4
FGDA9	Male	28	B. Ed Prim	4th	Moodle	4
FGDA10	Female	27	B. Ed Prim	4th	Moodle	4
Group B						
FGDB1	Male	39	B.Ed Sec	4th	Moodle	4
FGDB2	Female	30	B.Ed Sec	4th	Moodle	4
FGDB3	Female	26	B.Ed Sec	4th	Moodle	4
FGDB4	Male	28	B.Ed Sec	4th	Moodle	4
FGDB5	Female	40	B.Ed Sec	4th	Moodle	4
FGDB6	Female	39	B.Ed Sec	4th	Moodle	4
FGDB7	Male	37	B.Ed Sec	4th	Moodle	4
FGDB8	Female	31	B.Ed Sec	4th	Moodle	4
FGDB9	Female	30	B.Ed Sec	4th	Moodle	4
FGDB10	Female	29	B.Ed Sec	4th	Moodle	4
Group C						
FGDC1	Female	22	BSc IT	4th	Moodle	4
FGDC2	Male	36	BSc IT	4th	Moodle	4
FGDC3	Female	32	BSc IT	4th	Moodle	4
FGDC4	Male	27	BSc IT	4th	Moodle	4
FGDC5	Male	24	BSc IT	4th	Moodle	4
FGDC6	Male	25	BSc IT	4th	Moodle	4
FGDC7	Female	32	BSc IT	4th	Moodle	4
FGDC8	Female	36	BSc IT	4th	Moodle	4
FGDC9	Male	34	BSc IT	4th	Moodle	4
FGDC10	Female	27	BSc IT	4th	Moodle	4

Group D						
FGDD1	Female	24	BSc Comp Sci Edu	2nd	Moodle	2
FGDD2	Male	23	BSc Comp Sci Edu	2nd	Moodle	2
FGDD3	Male	22	BSc Comp Sci Edu	2nd	Moodle	2
FGDD4	Female	29	BSc Comp Sci Edu	2nd	Moodle	2
FGDD5	Female	32	BSc Comp Sci Edu	2nd	Moodle	2
FGDD6	Female	32	BSc Comp Sci Edu	2nd	Moodle	2
FGDD7	Female	36	BSc Comp Sci Edu	2nd	Moodle	2
FGDD8	Male	38	BSc Comp Sci Edu	2nd	Moodle	2
FGDD9	Male	39	BSc Comp Sci Edu	2nd	Moodle	2
FGDD10	Female	38	BSc Comp Sci Edu	2nd	Moodle	2

It is clear from the Table that the participants were drawn from four programmes: Bachelor of Education (Secondary), Bachelor of Education (Primary), Bachelor of Science in Information Technology and Bachelor of Science in Computer Science Education. The participants were mainly in the fourth year of study and included male and female students. The LMS used was Moodle, the official online platform for the university under investigation. The participants were of varied ages, and their experience in LMS use ranged from two to four years.

5.4 RESULTS ON STUDENTS' UNDERSTANDING OF INTERACTION IN ONLINE LEARNING

Results on students' understanding of interaction in online learning are reported in this section, starting with the quantitative findings from the structured questionnaire and moving on to the qualitative findings from the focus group discussions. After merging the results, any overlaps and areas of divergence are determined. The following section presents and analyses quantitative results.

5.4.1 Quantitative results on students' understanding of interaction in online learning

The first sub-section of Section B of the structured questionnaire sought to establish students' understanding of interaction in online learning in pursuit of the first research

objective of the study. Table 5.3 presents responses to students' understanding of interaction in online learning.

Table 5.3: Responses on students' understanding of interaction in online learning

Understanding of interaction	SA	A	D	SD	T	M	STD	Decision
Interaction is about how I work with others in doing common tasks online	155 (45.9%)	153 (45.3%)	23 (6.8%)	7 (2.1%)	338	3.35	0.699	Agreed
The interaction entails communicating with other students	78 (23.1%)	234 (69.2%)	24 (7.1%)	2(0.6%)	338	3.15	0.552	Agreed
The interaction entails the forming of an online learning community	61 (18%)	156 (46.2%)	117 (34.6%)	4(1.2%)	338	2.81	0.735	Agreed
Interaction is about exchanging learning resources with other students	85 (25.1%)	172 (50.9%)	41 (12.1%)	40 (11.8%)	338	2.89	0.915	Agreed
Interaction is about communicating with the course instructor	109 (32.2%)	158 (46.7%)	64 (18.9%)	7 (2.1%)	338	3.09	0.767	Agreed
Interaction is about how I access my course content	4 (1.2%)	51 (15.1%)	198 (58.6%)	85 (25.1%)	338	1.68	0.667	Disagreed
Interaction is about how I get involved in learning the course content	39 (11.5%)	6 (1.8%)	108 (32.0%)	185 (54.7%)	338	1.70	0.692	Disagreed
Interaction is about how I am able to move around within the Moodle Learning Management System	7 (2.1%)	46 (13.6%)	204 (60.4%)	81 (23.9%)	338	1.67	0.678	Disagreed
Interaction is about how I can use my device effectively for online learning	8 (2.4%)	81 (24.0%)	71(21.0%)	178 (52.7%)	338	1.76	0.735	Disagreed
Interaction is about getting assistance from the course instructor in the learning process	111 (32.8%)	184 (54.4%)	35(10.4%)	8 (2.4%)	338	3.18	0.705	Agreed
Average Mean						2.52		Agreed

SA - Strongly Agree; A - Agree; D - Disagree; SD - Strongly Disagree

M=Mean; ST.D=Standard Deviation. (Mean: 1.0 - 2.49 = Disagreed; 2.5 – 5.0 = Agreed)

The majority of the respondents, 91.2% (n=308), agreed that interaction was about how they worked with others in doing common tasks online. The majority of the respondents, 92.3% (n=312), also confirmed their understanding of interaction as entailing communicating with other students. Regarding forming online learning communities as an aspect of interaction in online learning, a majority of the respondents, 64.2% (n=217), agreed with the view. It was also revealed by the majority of the respondents, 76% (n=257), that interaction was also understood as students exchanging learning resources with others. Furthermore, a majority of the

respondents, 78.9% (n=267), confirmed understanding of interaction as about communicating with the course instructors. The majority of the respondents, 87.2% (n=295), agreed that interaction was about getting assistance from the course instructor in the learning process.

However, only a minority of the respondents, 13.3% (n=45), agreed that interaction was about how one got involved in learning the course content, indicating that the majority disagreed with this view. On the issue of accessing course content online, a minority of the respondents, 16.37% (n=55), confirmed this as an aspect of interaction in online learning, and this showed that a significant majority disproved this view. Similarly, a minority of the respondents 15.7% (n=53) agreed that interaction was about how they were able to move around within the Moodle Learning Management System, and this also indicates that the majority disagreed with the view and did not consider the ability to navigate the LMS as an aspect of interaction on online learning. A minority of the respondents, 26.4% (n=89), indicated that interaction was about how they could use their devices effectively for online learning, and the majority did not consider this as an aspect of interaction in online learning. Of importance to note in all the items that the majority of the respondents disagreed with is that interaction with technology was not considered an aspect of interaction in online learning by the respondents.

Table 5.3 shows that with an average mean response of 2.52, the respondents had a general positive understanding of interaction in online learning. Most of the items had a mean of 2.81 and above, showing that the respondents agreed with the items on their understanding of interaction in online learning. Only four out of the ten items had a mean of lower than 2.5, indicating disagreement with the views contained in the items. The following section provides qualitative results on students' understanding of interaction in online learning.

5.4.2 Qualitative results on students' understanding of interaction in online learning

This section presents the qualitative results from FGDs on students' understanding of interaction in online learning. The central theme generated sub-themes, which

included understanding interaction as communicating and working with fellow students, communicating with course instructors, and using Moodle LMS and technological devices. Table 5.4 presents the results of the students' understanding of interaction in online learning.

Table 5.4: Theme and sub-themes on students' understanding of interaction in online learning

Theme	Sub-Themes	Related Issues
Students' understanding of interaction in online learning	Communicating with fellow students	<ul style="list-style-type: none"> • Students send messages to each other • Students remind each other of deadlines or programme changes • making inquiries and sending reminders • seeking clarification on course content.
	Working with fellow students	<ul style="list-style-type: none"> • working together on given class tasks • forming online study groups • assignments, tests and/or examination preparation groups
	Sharing learning material/resources	<ul style="list-style-type: none"> • exchanging useful YouTube videos • sharing e-books and journal articles • sharing recorded lectures and past examination papers • sharing audio messages •
	Communicating with course instructors	<ul style="list-style-type: none"> • seeking clarification from course instructor • informing course instructor about submitted work • asking course-related questions to course instructors • Feedback from work graded online
	Accessing course content online	<ul style="list-style-type: none"> • student's ability to work online • all about technical skills • not about interaction
	Involvement in learning the course content	<ul style="list-style-type: none"> • online learning and individual exercise • expectations that one accesses course content and goes through exercises alone • How one engages with course content is not online interaction
	Use of the Moodle LMS	<ul style="list-style-type: none"> • One should be able to use Moodle, but this is not an interaction • success in online learning and effective participation in Moodle • One cannot learn online without the ability to access content on Moodle
	Use of technological devices	<ul style="list-style-type: none"> • One should have a proper device, such as a smartphone, tablet, laptop or desktop • ability to use a device • one cannot interact with a device, but some other person • need to be able to use the device well

5.4.2.1 Communicating with fellow students

The FGD participants showed that they understood interaction in online learning to involve communicating with fellow students. The following excerpts from some of the participants are evidence of the view;

As we learn online, there is always a need to communicate with other students doing the same course, and through this communication, one may get useful information about the course. (FGDA3)

I often send messages to my classmates seeking clarification on some tasks and always get help. (FGDC7)

A question or an inquiry may be posted on the WhatsApp group by one of the group members, and people take turns to respond. This helps one who would have posted and all of us as we all read the responses. (FGDD2)

Learning would be so difficult for us if there was no way to communicate with each other through WhatsApp and SMS because one would be stuck without knowing what to do on some of the tasks, and it can be frustrating. (FGDB5)

It is clear from the above excerpts that the participants' understanding of interaction was inclined towards the need to communicate with fellow students to exchange information, make inquiries, send reminders and seek clarification on course content. The issue of communication, therefore, becomes an essential aspect of interaction in an online learning environment.

5.4.2.2 Working with fellow students

The views of the FGD participants indicated their understanding of interaction in online learning as working with other students in the virtual learning space. Some of the views are captured in the excerpts below;

Sometimes, the lecturers give us group tasks, and we have to work together online. We often share documents on Google Docs and work together to develop one, and we all have to contribute, which is quite exciting. (FGDD6)

I am a member of a study group, and we do our work online. It is easy to do our work on Microsoft Teams or Zoom. (FGDB2)

In my group, we always use WhatsApp group video calls. WhatsApp group calls are actually cheaper, and we find them good for us. Every group member is able to join in and work with others, and I believe this is a form of interaction. (FGDC3)

There are times when I work together with my friends when we are preparing for assignments, tests and examination preparation groups. For examinations, we may link online and discuss some previous examination papers. (FGDA9)

It is, therefore, clear that the participants in FGD understood interaction in online learning in terms of working together with fellow students. Students could work together online on assigned work or their own work in preparing for assessments. Students also formed and participated in online learning communities.

5.4.2.3 Sharing learning material/resources

The FGD participants also indicated that they understood interaction in online learning in terms of sharing learning material or resources, as captured in the following excerpts from some of the participants;

There are some useful educational videos on YouTube, and we always share such videos by sending each other video links. It becomes very easy to access the videos and watch them. (FGDC9)

Still, on the same issue of sharing resources, we are able to send each other important resources such as e-books and journal articles useful for our studies. This sharing assists us in our learning as one can access useful resources with the click of a button. (FGDB1)

If I miss out on a live class session, the lecturer or fellow students may send me a link to the recorded session, and I will be able to watch and catch up with others. (FGDD4)

We interact very much in learning by sharing important audio messages on different aspects of our studies. The sharing of such information is cheap and fast through WhatsApp. (FGDA8)

The issue of sharing learning material resources or materials was, therefore, confirmed by the FGD participants as an aspect of their understanding of interaction in online learning. Through this sharing, students were able to send and access important resources such as YouTube videos, e-books, journal articles, recorded lectures and audio messages.

5.4.2.4 Communicating with course instructors

The issue of communicating with course instructors was also revealed by the FGD participants as an element of their understanding of interaction in online learning.

The following excerpts confirm the observation;

It is very easy for me to contact my course instructors seeking clarification on any academic matter related to my registered courses. I may just drop an email and expect some response. (FGDC5)

After submitting my work for assessment, I can communicate with the course instructor seeking confirmation if the submitted work has been received. (FGDA10)

Our communication with course instructors is also through receiving feedback from marked assignments, as some of the work is marked on the Moodle LMS, and we easily get responses. (FGDD9)

I also communicate with my lecturers by sending WhatsApp messages and making inquiries on any issue related to my studies, though some of them do not share their cell phone numbers with students. (FGDB3)

It was clear from the FGD participants that communication with course instructors was understood as interaction in online learning. The student's communication with course instructors allows them to seek clarification on academic matters, make different forms of inquiries and follow-ups, as well as receive feedback on assessed work.

5.4.2.5 Accessing course content online

The FGD participants did not view accessing course content online as an element of online interaction, and this was confirmed by the following excerpts from some of the participants;

It is true that one should be able to access content online, but it is not interaction because you will do it on your own. (FGDB2)

If one cannot access course content online, then there is no learning at all, but this is about one's skills and not interaction. (FGDA9)

To me, this is not about interaction but about being able to log in and visit different pages on the site and even download material. (FGDD6)

When one is dealing with a site that contains course content, it concerns the ability to work online, and it is not about interaction. (FGDC3)

It was evident from the FGD participants that accessing course content online was not understood as an aspect of interaction in online learning. The students were expected to be able to work online, access course content and learn, yet this was viewed as something other than online interaction.

5.4.2.6 Involvement in learning the course content

The following verbatim quotes from the participants in the FGDs illustrate their disagreement with the notion that interaction could be viewed as students' involvement in the study of the course material:

One has to access course content on the online platform, learn as an individual, and may not always learn with others. (FGDB8)

While I may interact with others here and there, I think learning online is for me as an individual. (FGDD5)

Learning online is different from learning in a normal class; you access course content on your own and learn. (FGDC10)

Most of the exercises require one to do them alone and submit for assessment. (FGDA2)

The contributions of the participants made it evident that learning online was deemed an individual exercise and that an individual's understanding of online interaction could not be connected to their actual involvement in learning the subject matter online. The manner in which a student engaged with the course content online was not considered to be a form of interaction.

5.4.2.7 Use of the Moodle LMS

The participants in the FGDs did not share the view that interaction could be viewed in the use of the Moodle LMS, and this was captured in the following verbatim quotations of the participants;

It is important for one to be able to use the Moodle LMS because all the learning online is on the LMS. However, I don't think interaction in online learning involves the use of the Moodle LMS. (FGDA1)

Without the ability to access content on the Moodle LMS, participate in discussion groups, upload assignments and download material, one cannot succeed in online learning, yet this cannot be viewed as interaction. (FGDB8)

An online student should always log onto the LMS and actively participate in learning by interacting with others on the LMS. One meets others on the learning platform, and this is a form of interaction. (FGDD1)

One should be able to use Moodle. One cannot interact with Moodle but use it for learning. (FGDC10)

What was apparent from the FGD contributions was that the participants confirmed the important role played by the LMS in ensuring that students accessed content and participated in online learning. However, the views could not be linked to an understanding of interaction in online learning, yet they felt strongly one had to be able to utilise the LMS to succeed in online learning.

5.4.2.8 Use of technological devices

The FGD participants raised several issues regarding using technological devices in online learning. The participants did not link the use of technological devices to their understanding of interaction in online learning, as captured in the following verbatim quotations of the participants;

Success in online learning depends on the possession of an appropriate technological device, such as a smartphone, tablet, laptop or desktop. (FGDA6)

A technological device has different functions, and one should be able to use the device to learn well online. (FGDC8)

I wouldn't say the use of a technological device is interaction, but a device is important in online learning. Without an appropriate device, online learning is almost impossible. (FGDD7)

Having a device is one thing, and being able to use the device is another. So, if one has a laptop or tablet, there should be good use of the device for online learning. (FGDB7)

It was clear from the responses that the FGD participants underscored the importance of technological devices in online learning. The main issues were the possession of an appropriate device and the ability to use the same for online learning. However, the importance of technological devices was not linked to the participants' understanding of interaction in online learning.

This section analysed and presented the qualitative results on the students' understanding of interaction in online learning. The following section triangulates quantitative and qualitative findings by addressing areas where the findings converge and diverge and come to the correct conclusions.

5.4.3 Triangulation of quantitative and qualitative findings

Results from the quantitative component of the study (questionnaire results) and results from the qualitative part (FGD) are combined, compared, and contrasted in this section to highlight any areas of overlap or inconsistency. Table 5.5 summarises quantitative and qualitative findings on students' understanding of interaction in online learning and shows areas of convergence and/or divergence.

Table 5.5: Triangulation table of findings from quantitative and qualitative data

Findings (Quantitative data)	Findings (Qualitative data)	Areas of convergence/divergence
Interaction was about how students collaborated online to do common online activities.	Collaboration with other students in a virtual learning environment best describes how students understand interaction in online learning.	Quantitative and qualitative evidence supports the view that the issue of collaboration in typical online tasks is an element of online interaction.
The interaction was understood to be communicating with other students.	Understanding of how interaction in online learning involves communicating with other students.	Quantitative and qualitative evidence support the view that online interaction involves student communication.
A shared understanding that creating online learning communities was an aspect of interaction in online learning.	A shared view that working together in virtual learning spaces was interaction in online learning.	Confirmation of the aspect of online learning communities from both quantitative and qualitative data sets.
Interaction was also understood to refer to students exchanging learning materials with one another.	The sharing of resources and learning materials was revealed as an aspect of online interaction.	Confirmation of the issue of sharing resources from quantitative and qualitative angles.
Interaction is understood to be communicating with the course instructors.	Communication with course instructors is indicated as an aspect of online interaction.	Both data sets complemented each other on the issue of interaction with course instructors.
Accessing course content online is not understood to be an element of interaction in online learning.	Accessing course content was technical about manipulating the system rather than interaction.	The two data sets complement each other in revealing that accessing course content online was not an element of online interaction.
Interaction was viewed as gaining assistance from the course instructor in the learning process.	Getting help and seeking clarification from course instructors were viewed as online interaction elements.	Both data sets Support the finding of seeking and obtaining assistance as an aspect of online interaction.
Interaction was about something other than how one participated in learning the course content.	Online learning was generally viewed as an individual exercise, and engagement with course content was not considered as interaction.	Both data sets confirm the finding that online interaction was not viewed as students' actual involvement in learning the course content.
Interaction was viewed as something other than one's ability to use the Moodle Learning Management System.	Moodle use is viewed as a technical skill, not an interaction aspect of online learning.	Quantitative and qualitative evidence supports that interaction was not viewed as one's ability to use the Moodle LMS.
Interaction was viewed as something other than one's ability to effectively use a technological device for online learning.	Using a technological device was considered technical and not linked to online interaction.	Quantitative and qualitative evidence supports the view that one's ability to use a technological device effectively was not a form of online interaction.

5.4.4 Interpretation of the triangulation table

According to the quantitative findings, interaction was about how students worked online to complete shared tasks. The qualitative findings similarly supported the quantitative findings, with participants indicating that interaction in online learning was best defined as collaboration with other students in a virtual learning environment. Both data sets converged to confirm that online interaction was understood as students collaborating in a virtual learning environment. Additionally, quantitative data established that interaction was understood to involve communication with other students. This finding was confirmed qualitatively through Focus Group Discussions (FGD), which revealed that interaction in online learning was viewed as communication between and among students in an online learning environment. As a result, the two data sets converged in supporting the idea that online interaction involved student communication online.

It was quantitatively proven that building online learning communities was a component of interaction in online learning. The same finding was established through Focus Group Discussions (FGD), where participants said that cooperating in virtual learning environments was an element of interaction in online learning. With the help of the two data sets, the concept of online learning communities as a component of interaction in online learning was established. The study's quantitative part also showed that interaction was viewed as the exchange of educational resources among students. The FGD provided qualitative confirmation of the same finding, which showed that sharing resources and educational materials is a feature of online interaction. The issue of sharing resources as a component of online interaction was supported by both data sets.

According to the study's quantitative component, interaction was characterised as students' communicating with the course instructors. On the qualitative side of the study, the same finding emerged since FGD participants said that students' communicating with course instructors was an element of online interaction. In proving that the issue of interaction with course instructors was an essential component in understanding online interaction, the two data sets complemented one another. The quantitative findings also showed that interaction was understood as receiving support

from the course instructors during the online learning process. The qualitative investigation also revealed that requesting course instructors for academic support was crucial to online interaction. The findings of viewing online interaction in terms of requesting and receiving support as a component of online interaction are supported by both data sets.

The quantitative findings, however, showed that accessing instructional content online was not considered a component of interaction in online learning. The FGD participants' views that obtaining course material online was a technical issue of operating the platform rather than a part of the interaction qualitatively corroborated the findings. The two data sets were complementary in establishing that accessing instructional content online was not a component of online interaction. Similarly, the quantitative results revealed that interaction was about something other than one's level of engagement with the course content. The FGD participants stated that engagement with the course content was not viewed as an element of interaction in online learning, as online learning was often an isolated exercise. The quantitative and qualitative data sets supported each other in showing how engaging in the actual study of course material online was not considered a component of online interaction.

The quantitative findings further showed that interaction did not indicate a student's ability to use the Moodle Learning Management System. On the qualitative side, Moodle usage was seen as a technical ability rather than a feature of online learning interaction. The view that interaction was not regarded as one's capacity to use the Moodle LMS is supported by both quantitative and qualitative research. The quantitative findings also supported the view that interaction was not considered a factor in one's capacity to use technology for online learning. From the qualitative side, using a technological device was regarded as technical and was unrelated to online interaction. The idea that one's capacity to properly operate a technical device was not an aspect of online interaction is supported by both quantitative and qualitative evidence. The following section presents and analyses results on the benefits students derive from interaction in online learning.

5.5 RESULTS ON THE BENEFITS STUDENTS DERIVED FROM INTERACTION IN ONLINE LEARNING

In this section, the results on the benefits students derive from interaction in online learning are reported, commencing with the quantitative findings from the structured questionnaire and followed by the qualitative findings from the focus group discussions. The two result sets are merged, determining convergence and divergence areas. The following sub-section presents and analyses quantitative results.

5.5.1 Quantitative results on the benefits students derived from interaction in online learning

The second section of the questionnaire sought to solicit responses on the benefits students derived from interaction in online learning in line with the second research objective of the study. Table 5.6 presents responses on the benefits students derive from interaction in online learning.

Table 5.6: Responses on the benefits students derive from interaction in online learning

Benefits students derive from online interaction	SA	A	D	SD	T	M	ST.D	Decision
I am able to learn from other students	133 (39.3%)	136 (40.2%)	55 (16.3%)	14 (4.1%)	338	3.15	0.838	Agreed
I work together with others in performing online tasks	37 (10.9%)	198 (58.6%)	87 (25.7%)	16 (4.7%)	338	2.76	0.706	Agreed
I feel supported by other students	44 (13.0%)	145 (42.9%)	134 (39.6%)	15 (4.4%)	338	2.64	0.761	Agreed
I feel supported by my course facilitator/instructor	63 (18.6%)	163 (48.2%)	75 (22.2%)	37 (10.9%)	338	2.75	0.885	Agreed
I make the best use of the Moodle LMS	12 (3.6%)	67 (19.8%)	181 (53.6%)	78 (23.1%)	338	1.78	0.750	Disagreed
I make the best use of the function of my device for learning	4 (1.2%)	45 (13.3%)	221 (65.4%)	68 (20.1%)	338	1.96	0.617	Disagreed
I get the necessary guidance regarding the required information on course content	79 (23.4%)	173 (51.2%)	72 (21.3%)	14 (4.1%)	338	2.94	0.781	Agreed
Course expectations are communicated by the course instructor	70 (20.7%)	201 (59.5%)	59 (17.5%)	8 (2.4%)	338	2.99	0.691	Agreed
The use of a live lesson via video conferencing, such as Zoom, improves participation.	74 (21.9%)	165 (48.8%)	80 (23.7%)	19 (5.6%)	338	2.87	0.816	Agreed
I obtain useful feedback from assessments	67 (19.8%)	182 (53.8%)	71 (21%)	18 (5.3%)	338	2.88	0.780	Agreed
Average Mean						2.67		Agreed

SA - Strongly Agree; A - Agree; D - Disagree; SD - Strongly Disagree

M=Mean; ST.D=Standard Deviation. (Mean: 1.0 - 2.49 = Disagreed; 2.5 – 5.0 = Agreed)

In discerning the results of the reported benefits of interaction in online line, as shown in Table 5.6, the majority of the respondents, 79.5% (n=269), confirmed that they were able to learn from other students. Furthermore, 79.5% (n=235) indicated that they could work together with others in online tasks. Another majority of the respondents, 55.9% (n=189), confirmed that they felt supported by other students, and 66.8% (n=226) indicated that they felt supported by their course facilitators. A majority of the respondents, 74.6% (n=252), also confirmed that they got the necessary guidance regarding the required information on course content. Regarding the communication of course expectations, a majority of the respondents, 80.2% (n=271), indicated that they agreed that the course instructor communicated the course expectations. A majority of the respondents, 70.7% (n=239), confirmed that the use of a live lesson via video conferencing, such as Zoom, improved student participation in online learning. On the issue of feedback, a majority of the respondents, 73.6% (n=249), confirmed that they obtained useful feedback from assessments.

However, only a minority of the respondents, 23.4% (n=79), agreed that they could make the best use of the Moodle LMS, and the majority did not confirm this, suggesting they could not fully and effectively utilise the online learning platform. In the same vein, 15.5% (n=49) indicated that they made the best use of the functions of their electronic devices for learning, and the majority did not confirm this, suggesting that they were unable to utilise the affordances on their devices for online learning fully.

Table 5.6 shows that with an average mean response of 2.67, the respondents indicated a general positive affirmation of the benefits of interaction in online learning. Most of the items had a mean of 2.64 and above, showing that the respondents agreed with the benefits they derived from interaction in online learning. Only two out of the ten items had a mean of lower than 2.5, indicating disagreement with the views on benefits contained in the items. The following section presents and analyses the qualitative results on the benefits students derive from interaction in online learning.

5.5.2 Qualitative results on the benefits students derived from interaction in online learning

This section presents the qualitative results from FGDs on the benefits students derive from interaction in online learning. The central theme produced sub-themes, which included collaborative learning, support for fellow students, course instructor support,

effective use of technology, enhanced participation, learning through social media and the importance of feedback. Table 5.7 presents the benefits students derive from interaction in online learning.

Table 5.7: Main theme and sub-themes on the benefits students derived from interaction in online learning

Theme	Sub-Themes	Related Issues
Benefits students derived from interaction in online learning	Collaborative learning	<ul style="list-style-type: none"> • learning together • learning from each other • exchanging knowledge • Participate and contribute to group activities
	Support for fellow students	<ul style="list-style-type: none"> • strong students supporting weaker ones • students with better understanding of concepts assisting others • sense on encouragement • peer tutoring
	Course instructor support	<ul style="list-style-type: none"> • requesting assistance from course instructors • Some technical assistance was offered • receiving assistance from course instructors
	Effective use of technology	<ul style="list-style-type: none"> • Getting all course content on the LMS • accessing learning by making use of devices with the internet • participating in learning on the LMS
	Enhanced participation	<ul style="list-style-type: none"> • participating in group discussions • working on course content and activities conveniently • Participating in online group tasks
	Learning through social media	<ul style="list-style-type: none"> • participating in social media groups • involvement in learning through social media groups
	Importance of feedback	<ul style="list-style-type: none"> • using feedback to review one's progress • immediate feedback through automation

5.5.2.1 Collaborative learning

The FGD participants indicated the benefit of interaction in online learning in providing collaborative learning opportunities and experiences. This view was captured in the following excerpts drawn from some of the participants;

I am always happy to know and feel that I am not alone in learning, as I have my partners with whom I can work. They are easily reachable by call, email or on the LMS. (FGDD10)

Working together with others makes studying in distance education very easy as one can learn from others. (FGDA5)

I always find it beneficial to exchange knowledge and information with others and improve my learning. (FGDB9)

Getting involved in group tasks compels one to read in advance so as to contribute meaningfully to the group and not to be seen as one with nothing to contribute all the time. (FGDC1)

It is important from the above verbatim quotations of the participants that interaction was considered beneficial as it allowed the distance education students to learn together, learn from one another, exchange knowledge and information, and participate and contribute to group activities.

5.5.2.2 Support for fellow students

The FGD participants highlighted the issue of support for fellow students as a benefit of interaction in online learning. The following captured views support this;

There are some of our colleagues who understand some of the difficult concepts very well, and they often explain the concepts to some of us in ways we understand. (FGDB6)

We are strong in different areas, and it is always to get someone to assist you in your weak areas, and it happens so much online. (FGDD3)

If it were not for the support that we get from our colleagues, some of us have dropped out, but with this support, we would continue to soldier on with our studies. (FGDA10)

I enjoy being tutored by my friends online. I understand the way they explain better than the course lecturers' ways. (FGDC2)

The above excerpts confirm that the participants indicated that support for fellow students was a benefit they derived from interaction in online learning. Such support enabled students to benefit from colleagues who could clarify concepts, students assisting others in areas of strength, general encouragement and support, and effective informal peer tutoring.

5.5.2.3 Course instructor support

The FGD participants revealed that course instructor support was considered a benefit of interaction in online learning. The view was captured in the following verbatim quotations by some of the participants;

If there are any course content issues that I find difficult to understand, I always write to the course lecturer, and I get assistance. (FGDC4)

Some assignment requirements may not be clear, and contacting the lecturers makes it possible for them to explain and guide. (FGDD5)

I may find it difficult to operate some systems on Moodle, and the lecturers often assist, though not always. (FGDA2)

I had problems with the use of the BigBlueButton for live sessions, and I received assistance with downloading the application, logging in and ensuring that my speakers were connected at the right volume. (FGDC6)

From the participants' viewpoints, it was clear that support sought from and offered by course instructors was a benefit of interaction in an online learning environment. Such support ranged from clarification in course content issues to assessment and technical issues.

5.5.2.4 Effective use of technology

The FGD participants also revealed that using their technological devices and the Moodle LMS, they benefitted immensely, as confirmed from the excerpts below;

Working on Moodle makes me access to all my course content and course activities all the time at the click of a button. (FGDB4)

As long as I have my laptop and internet access, I am connected to my learning wherever I am. (FGDD8)

I am able to participate in all learning activities by logging onto Moodle, and I will never be left behind. (FGDA4)

We often access videos and recorded lessons posted on Moodle, and these can be replayed until one understands. It is different from missing a scheduled face-to-face lecture, and you lose out on everything. (FGDC2)

It was clear from the discussion that through interaction with technology, the students were able to access course content on the Moodle LMS in a convenient, flexible and cost-effective manner. Furthermore, participation in the online learning activities was not fixed to particular times but was very flexible and only required appropriate devices and internet connectivity.

5.5.2.5 Enhanced participation

The FGD revealed that using Moodle LMS as a learning platform allowed students to enhance their participation in learning, which was beneficial. The following verbatim quotations from the participants support the viewpoint;

My participation in learning is not restricted to a fixed place and time. I can participate whenever I am free at any time of the day or night. (FGDA7)

I do take up in online group discussions where we are expected to post our views on a discussion topic and comment on other students' views. (FGDD2)

Content for all the courses I registered for and the expected activities are all available on Moodle, and I have to frequently visit the site to access content and do the activities. (FGDB6)

I am able to freely participate in online group tasks at my convenience time, and if we are to meet live online, we select a time convenient for all of us. (FGDC10)

The issue of enhanced participation in learning as a benefit of interaction in online learning was confirmed as possible through the students' interaction with the learning platform. Such interaction provided the convenience of learning without restrictions, free participation in group discussions, accessing course content and engaging in-class activities at any given time, and participating in live class sessions.

5.5.2.6 Learning through social media

Learning through social media platforms such as WhatsApp was deemed a benefit of interaction in online learning, as evidenced by the following excerpts from some of the FGD participants;

We form WhatsApp groups, which make it easy for us to communicate and learn together if we share the same course. (FGDD9)

WhatsApp makes it possible to hold our own live study sessions through WhatsApp conference calls and to ask each other questions and exchange ideas. (FGDB2)

I am a member of a WhatsApp group for course X, and the group members are active in the general exchange of information and learning. (FGDA7)

In our WhatsApp group, we take turns to present different topics in our course and then engage in discussion after presentations. WhatsApp calls are cheaper, and it makes learning easy for us. (FGDC5)

The crucial role played by social media platforms such as WhatsApp was highlighted as a benefit of interaction in online learning as the students were able to communicate, participate in live sessions, share information and ideas and partake in informally organised learning activities for enhanced studies.

5.5.2.7 Importance of feedback

The FGD participants also indicated the importance of feedback as a benefit of interaction in online learning, and this view is supported by the verbatim quotations of some of the participants as shown below;

Some of the comments I get from some activities assist me in continuing with my work and knowing my strengths and weaknesses. (FGDC8)

I am quite happy with instant feedback from automated responses. If one is writing a quiz test, for example, the results are obtained instantly upon completion of the test, and this is very good. (FGDD1)

It is important to get comments after every online activity as such comments assist one to monitor one's own progress. (FGDB10)

When I do well, I feel encouraged to continue with my work, so I find feedback very useful for me. (FGDA4)

The importance of feedback in online learning was deemed a benefit as feedback enabled students to measure their performance in online learning, and the utilisation of automated feedback was considered even better for immediate pointers necessary for one's progress in online learning.

This section analysed and presented the qualitative results on the benefits students derived from interaction in online learning. In the next section, triangulation of quantitative and qualitative findings is made by addressing areas where the findings converge and diverge and drawing the appropriate conclusions.

5.5.3 Triangulation of quantitative and qualitative findings

In this section, findings from the quantitative side of the study (questionnaire results) and findings from the qualitative component (FGD) are merged, compared, and contrasted, showing areas of synergy or otherwise. Table 5.8 summarises and triangulates the significant findings from the quantitative and qualitative results.

Table 5.8: Triangulation table of findings from quantitative and qualitative data

Findings (Quantitative data)	Findings (Qualitative data)	Areas of convergence/divergence
Students had the opportunity to learn from other students.	In the online group activities, students each contributed unique knowledge and skills and supported each other.	The finding that students benefited from online interaction through learning from one another is supported by both data sets.
Students were able to collaborate with others in doing online activities.	Opportunities to work together and exchange ideas.	The finding that opportunities for collaboration were provided by online engagement is supported by both data sets.
Students felt supported by other students	In online learning, there was mutual support for the students.	Both data sets Support the finding that students felt supported by others

The students felt the course facilitators' support.	Course instructor support was considered a benefit of interaction in online learning.	Both data sets Support the finding that students felt supported by course facilitators.
Students got the necessary guidance regarding the required information on course content.	Clarification and guidance were provided by course instructors on unclear content and assessment issues.	Both data sets support the issue of obtaining the necessary guidance on course content.
Course expectations were communicated by the course instructor.	Students received assistance in understanding course expectations and course content-related issues.	Both data sets provided evidence for the issue of course instructors' communication of expectations.
Using live lessons enhanced student participation in online learning via video conferencing platforms.	During live online classes, students can ask questions and interact with course instructors and fellow students.	Both data sets show that web conferencing tools for live online sessions increased student involvement.
Students obtained valuable feedback from assessments.	Feedback received enabled students to progress with their learning.	Both data sets addressed the issue of how feedback aided the students' online learning process.
Students were not able to make the best use of the Moodle LMS.	Students felt they were not fully exploiting what the LMS provided	Both data sets supported the finding that students did not fully utilise the LMS.
Students were not making the best use of the functions of their electronic devices for online learning.	Devices could be used for many things that weren't currently done.	Both data sets supported the finding that electronic device features were only partially utilised for learning.

5.5.4 Interpretation of the triangulation table.

The opportunity for students to learn from one another was quantitatively confirmed. A similar finding emerged qualitatively from Focus Group Discussions (FGD), in which participants agreed that in the online group activities, students each provided a special combination of knowledge and abilities while encouraging one another. With the aid of the two data sets, it was found that students benefited from online interaction by learning from one another. The quantitative part of the study also revealed that students could work in groups to complete online tasks. Additionally, it was established qualitatively that opportunities for collaboration and idea-sharing were provided through online interaction. Both data sets supported the finding that one benefit of online interaction is the opportunity for collaboration.

Additionally, the quantitative results demonstrated that students felt encouraged by their peers. On the qualitative side, it was discovered that there was reciprocal support for the students in online learning. The study's quantitative and qualitative

components both support the finding that students felt supported by others in online interaction. The students' sense of support from their course facilitators was also established quantitatively. Through the FGD, the qualitative component also showed that help from the course teacher was viewed as an advantage of interaction in online learning. The findings that students felt encouraged by course facilitators were thus strengthened by the complementary nature of the two data sets.

It was also quantitatively proven that the students had access to the required clarification and guidance about the course content and activities. Similarly, it was qualitatively shown that course instructors provided help and explanation on unclear content and assessment tasks. The two data sets thus supported one another in demonstrating that students were provided with the essential direction regarding the course content and activities, which was regarded as a benefit of online interaction. It was also quantitatively proved that the course instructor informed students of the expectations for the course. A qualitative analysis found that students were given help in comprehending the requirements of the course and other matters relevant to the course content. Both data sets supported the finding that one benefit of online interaction was the course teachers' clear communication of course expectations to students.

The use of live lessons via video conferencing platforms increased student engagement in online learning, according to the quantitative aspect of the study. Similarly, the qualitative component showed that during live online classrooms, students had the chance to connect with the teachers of their courses and other students. The two complimentary data sets helped establish the finding that using web conferencing solutions for live online sessions enhanced student engagement in online learning. The quantitative aspect of the study proved that assessments provided students with insightful feedback. Like how it was revealed from the qualitative component, receiving comments allowed students to progress in their learning. Both data sets complemented in establishing how feedback benefited the students' online learning.

It was quantitatively proven that students could not utilise the Moodle LMS to its fullest potential. It was also determined qualitatively that students believed they were

underutilising the LMS. Quantitative and qualitative lenses supported the conclusion that students needed to utilise the LMS fully. Additionally, it was quantitatively demonstrated that the students were required to utilise the features of their electronic devices for online learning to their fullest potential. The qualitative component revealed that electronic devices could be used for many things that weren't currently done to maximise online learning. Both data sets confirmed that some of the functionalities of electronic devices needed to be fully utilised for educational purposes.

This section triangulated quantitative and qualitative findings on the benefits students derived from online interaction. The following section presents and analyses results on how students were trained and supported for interaction in online learning.

5.6 RESULTS ON HOW STUDENTS ARE TRAINED AND SUPPORTED FOR INTERACTION IN ONLINE LEARNING

The results of the training and support provided to students for online engagement are presented in this section, starting with the quantitative findings from the structured questionnaire and moving on to the qualitative findings from the focus group discussions. The areas of convergence and divergence are then identified by merging the two result sets. The following sub-section presents and analyses quantitative results.

5.6.1 Quantitative results on how students were trained and supported for interaction in online learning

Following the third research objective of the study, the third component of the questionnaire aimed to elicit responses on how students were prepared and supported for involvement in online learning. Responses to questions on how students were trained and supported for interaction in online learning are shown in Table 5.9.

Table 5.9: Responses on how students are trained and supported for interaction in online learning

Statement	SA	A	D	SD	T	M	ST.D	Decision
I have been trained in the general use of the Moodle LMS	102 (30.2%)	36 (10.7%)	103 (30.5%)	97 (28.7%)	338	2.42	0.996	Disagreed
I have been trained in the use of interactive features of the LMS, such as the discussion forum	19 (5.6%)	35 (10.4%)	160 (47.3%)	124 (36.7%)	338	1.85	0.756	Disagreed
I have been trained in interactive plug-in features such as Jamboard	21 (6.2%)	30 (8.9%)	180 (53.2%)	107 (31.7%)	338	1.90	0.797	Disagreed
I have been trained in the use of social media for learning	32 (9.5%)	22 (6.5%)	151 (44.7%)	133 (39.3%)	338	1.81	0.894	Disagreed
I have been trained in the use of open educational resources (OERs)	15 (4.4%)	21 (6.2%)	167 (49.4%)	135 (40.0%)	338	1.75	0.891	Disagreed
I have received support when facing technical challenges online	12 (3.6%)	21 (6.2%)	253 (74.8%)	52 (15.4%)	338	1.98	0.819	Disagreed
I have been supported when seeking clarity on course content	73 (21.6%)	167 (49.4%)	73 (21.6%)	25 (7.4%)	338	2.85	0.841	Agreed
I have been supported when seeking clarity on assessment tasks	40 (11.8%)	206 (60.9%)	73 (21.6%)	19 (5.6%)	338	2.79	0.719	Agreed
I have been supported in working in an online group	47 (13.9%)	152 (45.0%)	114 (33.7%)	25(7.4%)	338	2.65	0.809	Agreed
I have been supported in accessing relevant learning material	34 (10.1%)	22 (6.5%)	88 (26.0%)	194(57.4%)	338	1.70	0.765	Disagreed
Average Mean						2.1		Disagreed

SA - Strongly Agree; A - Agree; D - Disagree; SD - Strongly Disagree
M=Mean; ST.D=Standard Deviation. (Mean: 1.0 - 2.49 = Disagreed; 2.5 – 5.0 = Agreed)

Only 40.9% (n=138) of the respondents, as shown in Table 5.9, acknowledged that they had received training in the general usage of the Moodle LMS, indicating that the majority of respondents had yet to receive such training. A minority of the respondents, 16% (n=54), also confirmed that they had received training on how to use the LMS's interactive features, such as the discussion forum, which further demonstrated that the majority had not. Only 15.1% (n=51) of the respondents indicated that they had received training on the usage of interactive plug-in features like Jamboard, indicating that the majority of respondents had not received such training. A small percentage of respondents, 16% (n=54), said they had received training in using social media for learning, indicating that the majority had not. Only 10.6% (n=36) of the respondents affirmed to have received training in the use of open educational resources (OER),

indicating that the majority had not. On the issue of support for technical challenges, only a minority of the respondents, 9.8% (n=33), confirmed that they had received support when facing technical difficulties online, indicating that a majority had not received such support. Only 16.6% (n=56) of the respondents confirmed that they had received assistance in accessing learning material on the online learning platform, indicating that the majority had not received such assistance. The majority of respondents, 71% (n=240), confirmed that they had received assistance when they had requested clarification on the course content. Similarly, 72.7% (n=246) of respondents indicated they were supported when they sought clarification on assessment tasks. In addition, the majority of respondents, or 58.9% (n=199), acknowledged that they had received support when participating in an online group.

According to Table 5.9, respondents had a negative affirmation of training and support for online interaction, with an average mean response of 2.1. The majority of the items' means fell below 2.50, indicating that respondents disagreed with the questions asking about the training and support they had received. Only three of the ten items had a computed mean higher than 2.5, showing agreement with the ideas on support and training expressed therein.

Having presented and analysed quantitative results in this section, the following section presents and analyses qualitative results on how students are trained and supported for interaction in online learning.

5.6.2 Qualitative results on how students are trained and supported for interaction in online learning

This section presents the qualitative results from FGDs on how students were trained and supported for interaction in online learning. The central theme generated sub-themes such as the provision of computer literacy training, minimal training for Moodle LMS use, collaborative learning, varied levels of proficiency in LMS use, lack of Support in Moodle LMS use, lack of support in technical troubleshooting, lack of support as well as lack of training on social media and OER use in online learning. Table 5.10 presents the results of how students were trained and supported for interaction in online learning.

Table 5.10: Main theme and sub-themes on how students are trained and supported for interaction in online learning

Theme	Sub-Themes	Related Issues
Training and support for students for interaction in online learning.	Computer literacy training provided	<ul style="list-style-type: none"> • General computer course offered in first-year • Computer literacy skills from high school • varying levels of computer proficiency
	Lack or minimal training provided Moodle LMS use	<ul style="list-style-type: none"> • no specific training on how to use Moodle • availability of a video on Moodle usage •
	Varied levels of proficiency in Moodle use	<ul style="list-style-type: none"> • Some students are good at using Moodle • Some students struggle with Moodle
	Lack of Support for Moodle Use	<ul style="list-style-type: none"> • No one is available to provide Moodle support • Frustration when one cannot access Moodle • Challenges experienced while using Moodle
	Lack of Support for technical troubleshooting	<ul style="list-style-type: none"> • No one is available to offer technical support • One may have problems with log-in credentials • No one to report technical problems to
	Lack of training for social media use	<ul style="list-style-type: none"> • No training for social media use for online learning • Learning through trial and error
	Lack of training for OER use	<ul style="list-style-type: none"> • No training for OER use • No knowledge about OER

5.6.2.1 Computer literacy training provided

The FGD participants indicated that basic computer literacy training was offered mostly through computer courses offered in the first semester of the first course. Furthermore, there were workshops offered on Moodle usage. The viewpoints were confirmed in the following excerpts;

We take a computer course in the first year, and this assists us in using computers and the Internet to access the LMS. (FGDA10)

Most of us have no problems in using computers and the XXX course further helps in sharpening our skills in computer usage. (FGDC6)

All computer skills are taught in the first year. We are able to use computers. (FGDD4)

Taking the computer course equips us with computer skills, and we apply some of the skills when using Moodle. (FGDB8)

The issue of the availability of computer literacy training was confirmed, and there was a dedicated computer skills course to develop students' proficiency in computer usage.

5.6.2.2 Limited or inadequacy of training provided Moodle LMS use

I was not trained on how to use Moodle. I try things myself and also learn from my friends. (FGDB1)

I heard some people saying that on our Moodle page, there is a pre-recorded video which takes one through all the expectations of working on Moodle, but I have never seen it. (FGDC5)

No one was trained in Moodle use. We learn as we use it. (FGDD6)

There is a video on how to use Moodle. I watched it, and it helped me a lot. (FGDA5)

No workshops were arranged for students specifically on Moodle LMS usage; hence, students learnt how to use the LMS on their own. Whilst there was a pre-recorded video on Moodle usage, it needed to be clarified how students would access and utilise it as a support resource available for students.

5.6.2.3 Varied levels of proficiency in Moodle use

The FGD participants indicated that students had different proficiency levels in using the Moodle LMS. The viewpoints are captured in the following excerpts from some of the participants;

Personally, I do not have any problem working on Moodle. I can use Moodle very well. No one trained me. (FGDA9)

I have seen some first-year students struggling with Moodle. Maybe it would be their first time to use it. (FGDD10)

Some students struggle in uploading assignments on Moodle or in taking quiz exercises. (FGDC1)

Through continuous use, it becomes easy and enjoyable to use Moodle for learning. (FGDB3)

The problem of varying levels of Moodle competence might be attributed to a lack of training because it was clear that students using an LMS for the first time faced significant difficulties. In contrast, others who had mastered it had not received formal training but attained mastery through experience. Accessing content, downloading

files, uploading assessments, and taking assessments are all fundamental to having a meaningful online learning experience. Thus, it is crucial for students to meaningfully interact with technology.

5.6.2.4 Lack of support for Moodle use

It was also revealed from the FGD that students needed more support as they learnt online utilising the Moodle LMS. The view on lack of support is supported by the following verbatim quotations from some of the participants;

The problem comes when one is working on Moodle and faces a slight problem, there is no one to assist and one has to contact friends to assist. (FGDC4)

It is very frustrating when I am working on Moodle LMS, and somehow I encounter a problem like failing to download an important document, and there is no one to help. (FGDD2)

It would be helpful if there is a helpline where one can quickly call to get Moodle support at any time. (FGDA1)

The only people who can assist us are our fellow students, who can only offer support at their convenient time. (FGDB5)

It was established that no Moodle assistance was available for online students, and no one was available to help them if they encountered difficulties using the LMS. A support system was required if one had trouble using Moodle's fundamental features, and students lamented the absence of a Moodle support helpline because they were forced to rely on well-wishers.

5.6.2.5 Lack of support for technical troubleshooting

The FGD participants also indicated that there was a lack of support for technical troubleshooting. The excerpts below from some of the participants confirm the lack of technical support;

It is sad. When one encounters technical problems, there is no one who can be contacted for support, especially after hours. (FGDB9)

I once had problems with my login details and could not access Moodle. It took very long to get assistance. (FGDC7)

The only way to get assistance is to phone the university, and at times, no one answers the phones, and there won't be any assistance. (FGDA8)

One cannot phone the technician at night, so if there are technical challenges, one has to wait until the following day to seek help. (FGDD7)

The issue of lack of technical support for students learning online was apparent and worrisome in that students could not be supported adequately during working hours, and there was absolutely no support after hours. There are always chances that some students working online may face technical challenges, such as problems with log-in details, hence the need for online or automated systems to offer help and allow students to deal with the challenges and proceed with learning.

5.6.2.6 Lack of training for social media use

The FGD participants also indicated that there needed to be more training for social media use in online learning. The following direct quotations from some of the participants support the observation of a lack of training for social media use;

I have never received any form of training in the use of WhatsApp or Facebook for learning online. (FGDC3)

All I know is that we just send each other messages on WhatsApp, and at times, we do conference calls, but no one taught us to do that. (FGDD5)

The use of WhatsApp for learning online is just by trying out different things on our own, and we continue with what works well for us. (FGDA6)

We use WhatsApp every day, so the same way we apply the skills when we use it for learning, communicating and sharing are the main issues. (FGDB4)

The lack of training for social media use in online learning was apparent and a cause for concern as students would only be expected to use social media platforms effectively for learning with deliberate training. The use of social media for learning is a pedagogical issue that requires adequate attention.

5.6.2.7 Lack of training for OER use

The FGD participants also revealed that they also indicated that they were not exposed to any training on the use of OER in online learning. The following excerpts from some of the participants support the viewpoint on the lack of training for OER use;

I am not aware of open educational resources and what they are. I have never been trained on them. (FGDC9)

We just search and find educational material on the internet, but we have not received any training. (FGDA3)

I am not aware of the different licenses for open educational resources. I just access and make use of relevant material in my assignments and projects. (FGDD8)

There are educational materials relevant to my course on the internet, but I don't know about the different types and how to use them. (FGDB7)

The issue of lack of training in OER use was confirmed from the discussions, and this finding is worrisome because OER plays a pivotal role as available resource material for online learning. Students should know the different OERs and how to access and use them within the various licensing requirements.

5.6.2.8 Support in clarification of course content.

The FGD participants revealed that they received support when they sought clarification on issues regarding course content. The following excerpts from some of the participants support the viewpoint on the support provided;

We often post questions on the 'Ask Me' forum on Moodle or a WhatsApp group, and the lecturers would respond and clarify issues. (FGDD8)

Some lecturers allow us to phone them and ask questions, and I have phoned some before and got assistance. (FGDA3)

I normally drop an email to the concerned lecturer, and a response is given, though it may be delayed. (FGDB7)

Lecturers are generally there for us to provide us with help when we need it, and it is easier during live online classes on BigBlueButton. (FGDC8)

The FGD participants confirmed the issue of the support given by course instructors about clarification on course content. It was clear that the assistance was provided in various ways because it could be obtained through LMS functions, calls, social media platforms, emails, and inquiries made during real-time online meetings.

5.6.2.9 Support in clarification of assessment tasks.

The FGD participants indicated that they sought and received support regarding clarification on assessment tasks. The viewpoint on the assistance offered is supported by the following quotes from some of the participants;

Some of the assessment task instructions may not be clear, and we request clarity and receive it through the WhatsApp group. (FGDA9)

During live online sessions, we are free to ask anything we may not understand on the assessment tasks. (FGDD4)

Some lecturers respond to emails, and this assists us to get clarity and proceed with the assessment tasks given. (FGDB5)

There are always ways to seek and get clarification than to continue with a task when one is not clear about certain things. (FGDC9)

The issue of the support provided by course instructors regarding explanations of assessment tasks was validated by the FGD participants. The students had a number of ways and options for getting answers to their questions on the specified assessment activities.

5.6.2.10 Support for participating in online groups

The FGD participants stated that they felt supported when taking part in online groups. The following quotes from a few of the participants support the views on the assistance provided;

The instructions for group activities are made clear and posted on the Moodle page, which guides us. (FGDD2)

The course instructors allocate us different roles, which make us all participate in the group activity. (FGDA5)

Our individual contribution to group activities is noted and rewarded. (FGDC6)

Course instructors check our work online and provide assistance. (FGDB4)

The issue of course instructors' support for students taking part in online groups was brought up. In online groups, it was noticed that students were not left on their own but rather had guidance and support.

5.6.3 Triangulation of quantitative and qualitative findings

The results of the questionnaire and the FGD from the qualitative component of the study are combined, compared, and contrasted in this section to highlight any areas of overlap or divergence. Table 5.11 summarises the triangulation of findings.

Table 5.11: Triangulation table of findings from quantitative and qualitative data

Findings (Quantitative data)	Findings (Qualitative data)	Areas of convergence/divergence
There was a limited of training received by students in the general usage of the Moodle LMS	No adequate specific training for Moodle usage.	The finding that there was limited specific training for students to use an LMS is supported by both data sets.
There was a lack of training on using the LMS's interactive features, such as the discussion forum.	Students learn to use the features by using them, with no training	The finding that no training was provided to students on how to use the interactive aspects of LMS is supported by both data sets.
There was a lack of training on using interactive plug-in features like Jamboard.	There was no training; students simply learned how to use the features by practically using them.	Both data sets confirmed that no training was given to students on using LMS plug-in features.
There was a lack of training received in the use of social media for learning.	There was no training. Students utilised their experience in the social use of the platforms such as WhatsApp	The finding that students were not given any instruction on how to use social media for learning was supported by both data sets.
There was a lack of training received in the use of open educational resources (OER).	No training at all in OER usage	Both data sets confirmed the finding that no training was received by students in the use of open educational resources (OER).
Students were not generally supported when facing technical challenges.	Lack of Support for technical troubleshooting.	Both data sets corroborated the finding that students were not supported for technical troubleshooting.
Students were not generally supported when accessing learning material on the online learning platform.	No support was provided, and students had to learn on their own to navigate the LMS and access content.	Both sets of data supported the finding that students were not assisted in obtaining course materials on the online learning platform.
Assistance was received when students sought clarification on the course content.	Assistance was received, and there were various ways of seeking and receiving support.	Both data sets supported the finding that they received assistance when seeking clarification on the course content.
Assistance was received when students sought clarification on assessment tasks.	Various methods for requesting and getting support were available, and assistance was obtained.	Both data sets supported the finding that students received assistance when seeking clarification on assessment tasks.
Assistance was received when students participated in online groups.	Continuous guidance and support were reported.	Both data sets supported the finding that students received assistance when participating in online groups.

5.6.4 Interpretation of the triangulation table.

The quantitative findings indicated that students had no general training in using the Moodle LMS. The qualitative results also stated that limited or inadequate specialised training was provided to students for using Moodle, which corroborated the quantitative findings. Both data sets supported the finding that limited specialised training was provided to students on using an LMS. The quantitative results also showed that limited training was given to students on using the LMS's interactive components, such as the discussion forum. Similarly, it became clear from the qualitative findings that students picked up using the interactive LMS features on their own, without any formal instruction. Both sets of data supported the finding that limited training was given to students on using the interactive features of the LMS.

The quantitative findings revealed that there needed to be training provided to students on how to use interactive plug-in features like Jamboard. Similarly, the qualitative findings showed that there was no formal instruction and that students just picked up the features' usage through actual use. Both sets of information pointed to the same finding: no training was offered to students on how to use LMS plug-in functionality. The qualitative findings showed that there needed to be training given to students on using social media for learning. Similarly, the qualitative findings showed little training and that students relied on their prior expertise and experience using social media platforms like WhatsApp. Both data sets supported the finding that no teaching was provided to students on using social media for learning.

Using open educational resources (OER) requires training, which the quantitative data showed needed to be improved. Similarly, the qualitative findings showed that no training was provided to students on how to use OER in online learning. To this end, both data sets corroborated the finding that students did not get any training in using open educational resources (OER). It was also quantitatively proven that students were not supported when encountering technical difficulties. The same finding that there was a lack of support for technical troubleshooting for students taking online courses was also confirmed qualitatively. The finding that students were not helped when encountering technical difficulties online was supported by both data sets.

The quantitative part of the study revealed that students were not assisted in obtaining course materials on the online learning platform. The qualitative aspect of the study also showed that no support was given and that students had to figure out how to use the LMS and access content independently. The finding that students were not assisted in locating course materials on the online learning platform was supported by both data sets. Quantitative evidence showed that students requested and received help understanding the course material. As the qualitative aspect revealed, students found this assistance online in various ways. The findings that students who sought clarification on the course content were assisted were supported by both data sets.

Quantitative evidence showed that students sought and received assistance to clarify problems with assessment tasks. Similarly, the qualitative aspect showed that students requested and received such assistance in various ways. The finding that assistance was provided when seeking clarification on assessment tasks was supported by both data sets. Additionally, it was quantitatively proven that students who took part in online groups got assistance. Similarly, the qualitative aspect demonstrated that students were continuously guided and supported as they participated in online group activities. Both data sets corroborated that students were given help when participating in online group activities.

This section triangulated quantitative and qualitative findings on how students were trained and supported for online interaction. The following section presents results on factors that promoted or hindered interaction in online learning at the rural-based university.

5.7 RESULTS ON FACTORS THAT PROMOTED OR HINDERED INTERACTION IN ONLINE LEARNING AT THE RURAL-BASED UNIVERSITY

The findings on the factors that promoted or hindered interaction in online learning at the rural-based university are presented in this section, beginning with the quantitative data from the structured questionnaire and continuing with the qualitative findings from the focus group discussions. The areas of convergence and divergence are then identified by merging the two result sets. The following sub-section presents and analyses quantitative results.

5.7.1 Quantitative results on factors that promoted or hindered interaction in online learning at the rural-based university

The fourth section of the questionnaire was designed to gather information about the factors that promoted or hindered interaction in online learning at the rural-based university, in keeping with the study's fourth research objective. Table 5.12 contains answers to questions on the factors that promoted or hindered interaction in online learning at the rural-based university.

Table 5.12: Responses on factors that promoted or hindered interaction in online learning at the rural-based university

Statement	SA	A	D	SD	T	M	ST.D	Decision
Course facilitators/instructors are always available to support students	22 (6.5%)	90 (26.6%)	114 (33.7%)	112 (33.1%)	338	2.10	0.925	Disagreed
Course content is clearly structured with clear expectations	32 (9.5%)	234 (69.2%)	56 (16.6%)	16 (4.7%)	338	2.83	0.651	Agreed
Other students are always willing to work collaboratively.	43 (12.7%)	163 (48.2%)	122 (36.1%)	10 (3.0%)	338	2.71	0.723	Agreed
Course facilitators/ instructors provide opportunities for collaborative learning	78 (23.1%)	173 (51.2%)	39 (11.5%)	48 (14.2%)	338	2.83	0.870	Agreed
Students had the appropriate devices/gadgets necessary for online learning.	106 (31.3%)	177 (52.4%)	51 (15.1%)	4 (1.2)	338	3.17	0.692	Agreed
There is reliable internet connectivity	28 (8.3%)	99 (29.3%)	125(37.0%)	86(25.4%)	338	2.20	0.916	Disagreed
Students are self-motivated to learn from one another	57 (16.9%)	222 (65.7%)	51 (15.1%)	8 (2.4%)	338	2.97	0.644	Agreed
Other students exhibit individualistic tendencies	94 (27.8%)	14 (4.1%)	74 (21.9%)	156 (46.2%)	338	2.13	0.815	Disagreed
Students look down upon each other	43 (12.7%)	30 (8.9%)	112 (33.1%)	153 (45.3%)	338	1.90	0.818	Disagreed
There are delays in the provision of immediate feedback	78 (23.1%)	151 (44.7%)	82 (24.3%)	27 (8.0%)	338	2.83	0.875	Agreed
There is a lack of support from course instructors	35 (10.4%)	152 (45.0%)	116 (34.3%)	35 (10.4%)	338	2.55	0.814	Agreed
Students incur huge data costs for online activities	135 (39.9%)	127 (37.6%)	54 (16.0%)	22 (6.5%)	338	3.11	0.900	Agreed
Students lack appropriate technological skills among	48 (14.2%)	143 (42.3%)	108 (32.0%)	39 (11.5%)	338	2.59	0.871	Agreed
Course instructors' differences in online engagement	46 (13.6%)	150 (44.4%)	103 (30.5%)	39 (11.5%)	338	2.60	0.863	Agreed
Average mean						2.61		Agreed

SA - Strongly Agree; A - Agree; D - Disagree; SD - Strongly Disagree
M=Mean; ST.D=Standard Deviation. (Mean: 1.0 - 2.49 = Disagreed; 2.5 – 5.0 = Agreed)

Only 33.1% (n=110) of the respondents agreed that course facilitators and instructors were always available to help students, which is a very small percentage. This showed that the majority of the respondents didn't share this opinion, and it was, therefore, possible to conclude that the absence or limited accessibility of course instructors hampered online interaction. The majority of respondents, 78.7% (n=266), agreed that the course content was properly structured and that there were clear expectations. It may be concluded that how courses were organised and structured encouraged online interaction. The majority of respondents, 60.9% (n=206), stated that other students were always willing to collaborate, and it was deduced from this finding that this readiness to work cooperatively was a factor encouraging online interaction. Among respondents, 74.3% (n=251) confirmed that the instructors and course facilitators provided opportunities for collaborative learning. Opportunities for collaborative learning were a positive factor in promoting online interaction. Regarding possession of appropriate gadgets, 83.7% (n=213) confirmed that students had the appropriate devices/gadgets necessary for online learning. The finding indicates the meeting of a fundamental requirement for online interaction: possession of the right tools for online learning. Only a small portion of the respondents, 37.6% (n=127), believed that reliable internet connectivity existed, indicating that the majority did not share this opinion. The findings suggest that inconsistent internet access was a barrier to online interaction. The vast majority of students, 82.6% (n=279), confirmed that students were self-motivated to share knowledge, which was inferred to be a factor fostering online interaction.

Only 31.9% (n=108) of respondents agreed that other students showed individualistic inclinations; the majority disagreed. This demonstrated that students' lack of individualism was a desirable quality required to promote online engagement. The majority of respondents disagreed with the idea that students treat one another with contempt, but a minority, 21.6% (n=73), did. It was determined that students did not treat one another with contempt, which was good since it encouraged online interaction. Regarding feedback, 67.8% of respondents (n=229) agreed that there were delays in providing immediate feedback, suggesting a factor that might impede online connection. Regarding help from course teachers, 55.4% (n=187) of respondents agreed there was an absence. Regarding data costs, 77.5% (n=262) of respondents agreed that students paid a high price for using the internet, and it was

clear from the result that this could limit their ability to communicate online. The majority of respondents, 56.5% (n=191), agreed that students lacked the necessary technology skills, while 58% (n=196) said the same about course teachers. The problem of inadequate technological knowledge could hamper online interaction. The majority of the respondents, 58% (n=196), also confirmed notable differences in the course instructors' levels of online engagement. Such a result could hinder online interaction as course instructors are all expected to exhibit high levels of online engagement in all the courses.

According to mean responses, structured courses with clear expectations (mean: 2.93), students' willingness to work collaboratively (mean: 2.71), students' motivation to learn from one another (mean: 2.97) and possession of appropriate devices (mean: 3.17) were identified as the main factors promoting interaction in online learning. According to the mean response, the problem with the high data costs associated with online learning was the most significant impediment to online interaction.

Following the presentation and analysis of quantitative results in this section, the following section discusses qualitative findings regarding the elements that promoted or hindered interaction in online learning at the rural university.

5.7.2 Qualitative results on factors that promoted or hindered interaction in online learning at the rural-based university

This section presents the qualitative results from FGDs on the factors that promoted or hindered interaction in online learning at the rural-based university. The central theme generated sub-themes such as the provision of collaborative learning opportunities, fellow students' willingness to collaborate, availability of technology, and the clarity of course structures as positive factors. Conversely, the unavailability of course instructors for support, delayed feedback, some students' individualistic tendencies, erratic internet availability and huge data costs were negative factors.

Table 5.13 presents the results of the factors that promoted or hindered interaction in online learning at the rural-based university.

Table 5.13: Main theme and sub-themes on factors that promoted or hindered interaction in online learning at the rural-based university

Theme	Sub-Themes	Related Issues
Factors promoting interaction in online learning	Provision of collaborative learning opportunities	<ul style="list-style-type: none"> • There are opportunities for working together • Social media groups allow group activities • Group tasks make us work together • Group projects call for collaboration
	Lack of individualistic tendencies by students	<ul style="list-style-type: none"> • Students were willing to work with others • Availability for group activities • Willingness to share ideas with others
	Fellow students' willingness to collaborate	<ul style="list-style-type: none"> • Easy to find colleagues to work with • WhatsApp groups make it easy to work together • Students see the need to work with others • Mutual benefit in working together
	Availability of technology	<ul style="list-style-type: none"> • Students in possession of laptops • Possession of tablets • Access to computer laboratories • Access to the Moodle LMS in and out of campus
	Clarity of some course structures	<ul style="list-style-type: none"> • Some courses have clear structures and easy-to-follow • Instructions for each individual activity are clear • Course expectations are provided in each unit • One can quickly go through the course without difficulties
Factors hindering interaction in online learning		<ul style="list-style-type: none"> • Course instructors may not be available online when required • Failure to get instant help from course instructors • Getting frustrated for lack of support
	Delayed feedback	<ul style="list-style-type: none"> • Assignments submitted take too long to be graded • Tests that are not electronically marked are not marked on time • Reaching exam time without coursework feedback • Signing continuous assignment marks without receiving back the graded work
	Erratic internet availability	<ul style="list-style-type: none"> • In some areas of the country, internet connectivity is a problem • Internet disruptions while connected to the LMS • Being kicked out of Zoom live sessions

	Huge data cost	<ul style="list-style-type: none"> • Need to sufficient data bundles to study online • Data an extra cost to students • Live online lecture sessions require a lot of data • Learning online will be more affordable with the support of data
	Lack of the necessary technological skills by students	<ul style="list-style-type: none"> • Feelings that more could be done in exhibiting technological skills • Need to develop advanced technological skills • Struggles with some tasks done online
	Differences in course instructors' levels of online engagement	<ul style="list-style-type: none"> • Lecturers are not the same • Some lecturers do more work on Moodle than others • Differences are observable

5.7.2.1 Provision of collaborative learning opportunities

The FGD participants indicated that the provision of collaborative learning opportunities was a factor that promoted interaction in online learning. This viewpoint is supported by the following verbatim quotations from some of the participants;

Some of the online tasks make it possible for us to work together. If it is a group assignment, one has no choice but to work with others. (FGDD3)

We have WhatsApp groups in every course, and we work together in these groups. (FGDB1)

In some courses, we are arranged in groups and given some work together, and participation in the group is rewarded. (FGDA6)

Whenever we are given group tasks, we are forced to organise ourselves and work together to complete the task. (FGDC9)

It was evident from the discussion that the opportunities for collaborative work in the different online courses heightened the chances for online interaction. When collaborative tasks were given to students, it became imperative that students work together to complete and submit the assignment. The existence of student-initiated social media groups also predisposed students to work collaboratively.

5.7.2.2 Fellow students' willingness to collaborate

Additionally, it came out of the FGDs that the willingness of other students to work together was a significant and positive component. The following quotes from a few of the participants help to reinforce this point:

It is easy to find partners to work with because people are always willing to work with others. (FGDC1)

We already belong to the WhatsApp groups that we form for different courses, and it becomes easy to use the same groups to work together. (FGDA10)

Almost all of us see the need to work together because we all stand to benefit by sharing ideas. (FGDB7)

The need to work together is because not everyone knows everything, and we all gain from working together. (FGDD1)

It was evident from the discussion that the willingness of fellow students to collaborate was another positive factor promoting interaction in online learning. It was great to note it was easy for students to establish partnerships. Furthermore, students exploited their participation in social media groups to collaborate in online learning. Students also appreciated the mutual benefit of online interaction, and this was a motivating factor for collaboration.

5.7.2.3 Availability of technology

The FGD participants also indicated that the availability of technology was a factor that promoted interaction in online learning. The viewpoint is supported by the following verbatim quotations from the participants;

All students have the appropriate devices for online. I have a laptop and a tablet, and all I need is internet connectivity, and then I can access Moodle. (FGDB4)

Almost everyone owns a smartphone, and with a smartphone, one is able to learn online without any problem. (FGDA3)

There are a number of computer laboratories on campus, and one can access computers and free Wi-Fi by visiting any campus and digital learning centres. (FGDD5)

Moodle is easily accessible by students in and out of campus. Once one accesses it, then online learning is possible. (FGDC5)

Students could participate in online learning and interact with content, technology, course instructors, fellow students, and technology when they had access to and possession of the appropriate technological devices. Additionally, students had remote access to the Moodle LMS.

5.7.2.4 Clarity of some course structures

The FGD participants also indicated that the explicit structuring of some of the courses on the Moodle LMS made learning and engagement easy. The following excerpts from some of the participants confirm the assertion;

In some of the courses, the structure is very clear, and one can proceed with the work with a clear step-by-step guide. (FGDD10)

The expectations in course CSCXXXX are very clear, and the lecturer provides clear instructions for all the activities. (FGDA1)

The learning activities are well-explained, and what we are assigned to is very clear, which makes learning easy. (FGDC10)

In course ALLXXX, one can easily go through the course on Moodle without any challenges because it will be like you are communicating directly with the lecturer. (FGDB9)

It was established that one important component encouraging engagement in online learning was the clear course structures on the LMS, which has implications for instructional design. The way of presenting courses on the LMS offered direction, crystal-clear explanations of subject matters, and directions for tasks that allowed students to meaningfully participate in online learning and, invariably, interact at various levels.

5.7.2.5 Lack of adequate online support from course instructors

The FGD participants lamented the lack of adequate online support from the course instructors as a handicap. It was clear that without the needed support, online interaction was negated, as shown in the following excerpts;

There are times when working online, and one requires assistance, but it may be difficult to get it from course instructors. (FGDA8)

I have to send an email requesting assistance, and it takes time to get a response, and this affects my progress with work. (FGDC3)

Most of the time, I end up asking my friends for help because the course instructors are not available. (FGDD7)

The most frustrating thing about working online is failure to get assistance at the time of need. It is really frustrating. (FGDB2)

The course instructors' lack of online support was viewed as a factor impeding interaction in online learning since it impeded the students' learning progress. Additionally, the absence of support led to frustration, which was detrimental to successful online learning.

5.7.2.6 Delayed feedback

The FGD participants also mentioned that a barrier to involvement in online learning was the delay in feedback. The view is supported by the following exact quotes from some of the participants;

In discussion forums, the course lecturer may take long to look at our posts and make comments. One will not be sure if the contribution to discussion is good. (FGDC7)

Some of the assignments we submit online take long to be graded. We may keep checking on Moodle, but there won't be any graded work. (FGDD3)

Only tests and quizzes that are graded electronically result in immediate feedback; everything else appears to be a problem. (FGDB10)

At times, we reach exam time with some coursework assignments still to be graded, and it is not good at all. (FGDA5)

In online learning, the absence of delayed feedback was seen as a barrier to interaction since it prevented students from gaining the necessary information about their progress. Feedback is crucial to the development of online learning. Concern was also raised by the fact that, in some cases, students would show up for their examinations after receiving feedback for all their coursework assignments.

5.7.2.7 Lack of individualistic tendencies by students

The FGD participants indicated that the behaviour of some students who did not exhibit individualistic tendencies and were willing to work with others was considered a factor that promoted interaction in online learning. The following verbatim quotations from some of the participants confirmed the point;

We always try to avoid the know-it-all attitude and commit to working with others all the time. (FGDD2)

In group activities, all students do play their part and contribute together with others. (FGDC6)

In group activities, we provide each other chances to contribute so that no one dominates the group discussions. (FGDA4)

When we organise WhatsApp video conference calls to discuss something, always set up a time when we are all available and can attend. We try to accommodate everyone. (FGDB8)

It was established from the discussion that behavioural issues pertaining to attitudes towards group activities positively affected interaction in online learning. The group members tried to be accommodative and ensure the participation of everyone, which was vital for online interaction.

5.7.2.8 Erratic Internet availability

The FGD participants also revealed that erratic internet availability in some parts of the country negatively affected their online learning endeavours and, invariably, online interaction. The following excerpts from some of the participants confirm the viewpoint;

In the XXXXXX region where I reside, there are times when we do not have access at all, and it becomes difficult to log onto Moodle or participate in WhatsApp meetings. (FGDC4)

What is disappointing in online learning is to face disruptions while connected to the LMS, and all of a sudden, one cannot access it. (FGDD9)

There are times when I will be participating in live online classes through Zoom, and due to internet challenges, I am kicked out. (FGDA9)

In my area, during peak hours, internet speed is very slow, and I have to utilise the early hours of the morning to do my work. (FGDB6)

Since students in some areas of the country had trouble connecting to the internet, it was reported that this issue was a barrier to online interaction. Additionally, internet access could have been faster in some locations, which occasionally prevented students from taking part in live online classes.

5.7.2.9 Huge data cost

The FGD also revealed that huge data cost was a negative factor affecting students' online interaction, and this viewpoint was confirmed by participants in the following verbatim quotations;

Data is costly. We spend a lot of money to buy data so that we can access the Moodle LMS and learn online. (FGDA7)

I am a self-sponsored student, and buying data is an additional cost for me, which makes the cost of study quite high for me. (FGDD8)

It is more expensive to join live online lecture sessions because one requires a lot of data, and this is, at times, unaffordable. (FGDB5)

There was a time when the university used to support students with data, but this has since stopped, and students have to fund themselves now. I feel that students should be supported with data. (FGDC2)

Since students had to pay for the costs of obtaining data for online learning as an additional expense on top of their study costs like tuition fees, the issue of enormous data cost was established as a barrier to meaningful online interaction. Additionally, attending live online classes costs much money and requires more data. The students felt that being assisted with data would be helpful for their online learning.

5.2.7.10 Students lack the adequate necessary technology skills

It was also revealed from the FGD that the students had basic skills in technological abilities; hence, they lacked the necessary technological skills to enhance online interaction. The following verbatim quotations support the point;

Of course, we can access course content on Moodle and get involved in online discussions, but I feel we could do more online. (FGDC10)

One course instructor requested us to work on a Google Docs document, and it took time for most students to master this basic skill. (FGDA8)

Working collaboratively on Jamboard was also a challenge for some of us when it was introduced by one of the lecturers. (FGDD4)

I just feel there is more that we can do online if we have advanced technological skills. (FGDB5)

It was clear from the discussions that the students viewed themselves as not possessing adequate necessary technological skills to manipulate the virtual learning space for enhanced online interaction. The finding has profound implications for the support provided to students for online learning and engagement.

5.2.7.11 Differences in course instructors' levels of online engagement

The FGD indicated that there were differences in the ways the course instructors engaged students online, which was a hindrance to online interaction. The following verbatim quotations from some of the students confirm the viewpoint;

One can tell that not all the lecturers are the same in online teaching. Some of them involve us a lot in activities online, and some do not. (FGDD3)

In course XXX, we do not do much online when you compare it with what we do in course XXX. (FGDA7)

The courses are different on Moodle. Some courses show that the lecturers really teach us online, yet some are not of the same quality. (FGDB2)

I think it happens even in face-to-face classes; lecturers are not the same. Some lecturers prepare well, explain clearly and are very good, while some are not, and the same happens online. (FGDC2)

It was clear from the discussions that the quality and level of course instructors in online engagements would differ. The finding has implications for the nature and extent of professional development of course instructors in online course design and online pedagogy.

5.7.3 Triangulation of quantitative and qualitative findings

The questionnaire results and FGD ones are integrated, contrasted, and compared in this section to identify any areas of overlap or divergence. Table 5.14 provides a summary of the triangulated findings.

Table 5.14: Triangulation table of findings from quantitative and qualitative data

Findings (Quantitative data)	Findings (Qualitative data)	Area(s) of convergence/divergence
Course instructors provided opportunities for collaborative learning.	Opportunities provided for students to work together online	Both data sets confirm that there was the existence of opportunities for collaborative learning.
Students were always willing to collaborate with others.	Students willing to work with others and share knowledge	Both data sets confirm that students were willing to work with others.
Students confirmed they had the required gadgets for online learning	Students had computers, smartphones, tablets and laptops	Both data sets supported the finding that students had the necessary electronic devices.

The course content was structured correctly, and there were clear expectations.	Clear structuring of some of the courses on the Moodle LMS made learning and engagement easy.	The finding that course content was well-structured with clear expectations was supported by both data sets.
Course facilitators and instructors were only sometimes readily available to help students.	Lack of adequate online support from course instructors	Both data sets support the need for proper support from the course instructors.
There were delays in providing immediate feedback	Delays in feedback reported	Both data sets confirm the delay in feedback
Students did not show individualistic inclinations	Students did not despise others and were willing to cooperate	Both data sets supported the finding of the lack of individualistic tendencies.
Internet connectivity was unreliable.	Reported challenges with internet connectivity	The finding on unreliable internet was supported by both sets of data
There was a challenge of huge data costs incurred by students	Students paid enormous data expenses for online learning	Both data sets concurred on substantial data costs.
Students lacked the adequate necessary technology skills	It was reported that students had basic skills and could do more.	Both data sets confirm the lack of adequate necessary skills in students.
There were differences in course instructors' levels of online engagement.	Not all course lecturers engaged students online at the same level.	Both data sets confirmed the differences in course instructors' level of online engagement.

5.7.4 Interpretation of the triangulation table

The study's quantitative results showed that the course teachers offered collaborative learning possibilities. The same conclusion was qualitatively substantiated when FGD participants indicated that chances were available for students to collaborate online. Both data sets confirmed the presence of opportunities for collaborative learning. It was also found quantitatively that students were always willing to collaborate with others, and qualitatively, it was also found that the students were willing to work with others and share knowledge. The willingness of the students to work with others was corroborated as a finding of the study from both quantitative and qualitative aspects.

Students' confirmation that they possessed the necessary devices or advice to participate in online learning was demonstrated quantitatively. Additionally, the FGD provided qualitative proof that students typically had appropriate equipment, such as laptops, tablets, and smartphones. Both sets of data corroborated the view that students' possession of the necessary electronic gadgets was a significant positive factor in promoting online interaction. The study's quantitative component revealed that the course material was appropriately organised and had specific expectations.

Qualitative analysis found that several courses on Moodle LMS's clear structuring made learning and participation simple. Both data sets confirmed that a well-structured course with clear expectations was a positive factor in promoting online interaction.

The quantitative findings showed that the course facilitators were only sometimes available to assist students. The qualitative data corroborated a similar absence of practical online assistance from course teachers. Both data sets support the conclusion that the course instructors did not provide appropriate support, as the perceived lack of support constituted a barrier to online interaction. The quantitative findings also showed that there were delays in delivering prompt feedback. The qualitative element revealed that there were delays in reporting feedback. Such delays could negatively affect online interaction, and both data sets supported this.

The study's quantitative component showed that students did not exhibit individualistic tendencies. The same finding was qualitatively supported by evidence showing students were cooperative and did not look down upon others. Both data sets confirmed the view that the absence of individualistic tendencies served as a factor that encouraged online engagement. The quantitative findings demonstrated that the majority of students had unstable internet connectivity. The study's qualitative component also revealed more information on the pupils' reported difficulties connecting to the internet. Both data sets confirmed that inconsistent internet made it difficult to interact online. The quantitative outcomes supported the issue of the significant data expenses borne by students. Similar to the quantitative findings, the qualitative findings demonstrated that students incurred significant data costs for online learning, which limited online interaction. Both data sets confirmed huge data expenditures.

The quantitative results further indicated that the students needed more technology skills. The same finding was confirmed qualitatively when FGD participants indicated that students had basic skills and could do more to enhance their learning online and online interaction. More advanced technological skills were needed to improve online interaction. Both data sets confirm the lack of adequate necessary skills in students. It was established quantitatively that there were differences in course instructors' levels of online engagement. Similarly, the qualitative results revealed that not all course

lecturers engaged students online at the same level. Both data sets confirmed the differences in course instructors' level of online engagement.

This section triangulated quantitative and qualitative findings on the factors that promoted or hindered online interaction. The following section presents results on the implications for online pedagogy at the rural-based university by assessing the common techniques utilised for online interaction.

5.8 RESULTS ON THE IMPLICATIONS FOR ONLINE PEDAGOGY AT THE RURAL-BASED UNIVERSITY

This section presents results on the typical online teaching and learning strategies used at the rural-based university, starting with the quantitative results from the structured questionnaire and moving on to the qualitative findings from the focus group discussions. The assessment of the implications for online pedagogy is done in this way. The two result sets are combined to identify the points of convergence and divergence. The following sub-section presents and analyses quantitative results.

5.8.1 Quantitative Results on the Implications for online pedagogy at the rural-based university

In line with the study's fifth research objective, the fifth section of the questionnaire was created to collect information concerning the implications of online pedagogy at the rural-based university. Results from the responses on common techniques utilised for online interaction are shown in Table 5.15.

Table 5.15: Responses on common techniques utilised for online interaction

Common approaches utilised for online interaction.	Always		Often		Sometime		Rarely		Never		Remarks
	No.	%	No.	%	No.	%	No.	%	No.	%	
Discussion forum	107	31.7	94	27.8	49	14.5	44	13.0	44	13.0	Commonly used
Wikis	3	0.9	67	19.8	55	16.3	115	34.0	98	29.0	Uncommonly used
Collaborative problem-solving activities	19	5.6	46	13.6	49	14.5	184	54.4	40	11.8	Uncommonly used
Group tasks on WhatsApp	113	33.4	75	22.2	78	23.1	37	10.9	35	10.4	Commonly used
Group tasks on Facebook	21	6.2	26	7.7	43	12.7	38	11.2	210	62.1	Uncommonly used
Research and presentation	37	10.9	67	19.8	53	15.7	92	27.2	89	26.3	Uncommonly used

Collaborative creation of digital products/artefacts	20	5.9	53	15.7	66	19.5	100	29.6	99	29.3	Uncommonly used
Online Group assignments	89	26.3	119	35.2	41	12.1	54	16.0	35	10.4	Commonly used
Online Group projects	52	15.4	46	13.6	69	20.4	96	28.4	75	22.2	Uncommonly used
Online Group practical activities	32	9.5	57	16.9	45	13.3	100	29.5	104	30.8	Uncommonly used
Live lessons on video conferencing platforms such as Zoom	98	30.0	105	31.1	55	16.2	38	11.2	42	12.4	Commonly used

As shown in Table 5.18, some techniques were reported as common and some as uncommon. In interpreting the responses, the 'always' and 'often' responses were considered common, while the 'rarely' and 'never' were deemed uncommon. The following techniques were found to be commonly used in promoting online interaction: discussion forums 59.6% (n=201), group tasks on WhatsApp 55.6% (n=188), online group assignments 61.5% (n=208) as well as live lessons on video conferencing platforms 61.1% (n=203). Conversely, the following techniques were found to be uncommon: use of Wikis 63% (n=213), collaborative problem-solving activities 66.2% (n=224), group tasks on Facebook 73.3% (n=248), research and presentation 53.5% (n=181), collaborative creation of digital products/artefacts 64.3% (n=199), online group projects 50.6% (n=171), online group practical activities 60.3% (n=204). The following section presents the qualitative results on the implications for online pedagogy at the rural-based university.

5.8.2 Qualitative results on the implications for online pedagogy at the rural-based university

The qualitative findings from focus group discussions (FGDs) on the most popular online instructional approaches at the rural-based university are presented in this section. The primary theme gave rise to sub-themes like discussion forums, WhatsApp group tasks, online group assignments, and live online sessions as a result of the often-used strategies. On the other hand, rarely used methods included group projects on the Moodle LMS, group projects on Wikis, group projects on Facebook, online research and presentations, the development of products or artefacts, and online group practical exercises.

Table 5.16 presents the results on the implications for online pedagogy at the rural-based university.

Table 5.16: Main theme and sub-themes on the responses on common approaches utilised for online interaction at the rural-based university

Theme	Sub-Themes	Related Issues
Commonly used online pedagogical techniques	discussion forum	<ul style="list-style-type: none"> • given discussion questions to work on • Posting responses to the given question • responding to the instructor's comments and other students' posts
	group tasks on the WhatsApp platform	<ul style="list-style-type: none"> • using WhatsApp to communicate on tasks • sharing ideas about group task • sharing resources • meeting to discuss group tasks
	online group assignments	<ul style="list-style-type: none"> • working together on Google Docs • contributing to a group document • responding to comments on the group document • learning from other students
	live online sessions	<ul style="list-style-type: none"> • Some lecturers organise Zoom lessons • ability to ask questions for clarification • responding to the instructor's questions • feeling of being in an actual lecture room
Uncommonly used online pedagogical techniques	collaboration tasks on Wikis	<ul style="list-style-type: none"> • never heard about Wikis • have not done anything on Wikis
	Group tasks on Facebook	<ul style="list-style-type: none"> • No lecturer uses Facebook to teach • have not worked with colleagues on Facebook to learn • Facebook is just for social interaction
	online research and presentation	<ul style="list-style-type: none"> • No research tasks given online • did not do any research work online • No presentations done by students online
	creation of digital products or artefacts	<ul style="list-style-type: none"> • No task was given to creating digital products or artefacts • never created any digital product or artefact
	online group projects on Moodle LMS	<ul style="list-style-type: none"> • No online group project is given on Moodle • have not participated in online group projects on Moodle
	online group practical activities	<ul style="list-style-type: none"> • No practical tasks done online • No lecturer gives practical activities online

5.8.2.1 Discussion forum

It was clear from the focus group discussion that the discussion forum was a commonly used pedagogical approach, and the following excerpts from the participants evidenced this;

In some courses, we are given discussion questions to work on, and this allows us to exchange ideas on a topic. (FGDD4)

One is forced to read around and research before posting on the discussion forum. This makes one to make a meaningful contribution to the discussion. (FGDC7)

Discussion questions make it possible for me to comment on other students' posts, and they also comment on mine. (FGDA4)

I am also able to read the lecturer's comments and respond to any questions posed by the lecturer. (FGDB3)

Using a discussion forum as a common online teaching and learning approach allowed students to prepare adequately before posting in response to a lead discussion question. Furthermore, students could exchange ideas with fellow students by asking questions on other posts and responding to instructors' and fellow students' comments.

5.8.2.2 Group tasks on the WhatsApp platform

The FGD participants revealed that Group tasks on the WhatsApp platform were a common technique utilised for online learning. The following verbatim quotations from the participants confirm the viewpoint;

It is easy for us to use WhatsApp to work on a given group task because we can easily communicate and do the work. (FGDA10)

We are able to share ideas on a group task via WhatsApp as this platform is cheap and convenient for us. (FGDC5)

The WhatsApp platform also makes it easy for us to share resources, as we can send different files to each other without any problem. (FGDB9)

Through WhatsApp, we are able to make conference calls to meet to discuss group tasks, as this is very cheap, and everyone has WhatsApp on their phone. (FGDD1)

The use of group tasks on the WhatsApp platform was established as a common approach for online learning. The main issues noted are that the WhatsApp platform was cheap and convenient for the students as most of them had it on their phones. The WhatsApp platform made sharing materials for shared group projects, organising live group meetings, and communicating simple.

5.8.2.3 Online group assignments

The FGD participants also indicated that online group assignments were a common technique. The following verbatim quotations from some of the participants support the point;

We have the opportunity to work on a common assignment in groups, and this makes everyone participate. (FGDC9)

Developing a single document on Google Docs makes us make our contributions, and the lecturer makes comments. (FGDD10)

Working on a common online group assignment allows us as students to learn from each other and also benefit from the lecturer's comments. (FGDA7)

Everyone would want to be seen as having contributed to the development of a common assignment done online. (FGDB1)

Online group assignments were identified as a widely used strategy that encouraged online interaction. Students could collaborate, contribute to a group document, learn from one another, and take advantage of the lecturer's comments because of this method. The strategy offered opportunities for online collaboration.

5.8.2.4 Live online sessions

The FGD participants also indicated that live online sessions through video conferencing platforms such as Zoom, Google Classroom and BigBluebutton were commonly used for online interaction. This viewpoint was supported by the following excerpts from some of the participants;

In a lot of courses, some lecturers conduct live lessons through Zoom. (FGDB6)

We often have Zoom classes, and during these classes, we are able to ask questions and seek clarification. (FGDD7)

In Zoom classes, the lecturer may demonstrate skills that we need to acquire, and it is good to see the lecturer demonstrate. (FGDA1)

After explaining concepts in live online sessions, the lecturers often ask us questions, and we are able to answer and get corrected if we answer wrongly. (FGDC4)

The discussions revealed that live online sessions conducted through appropriate web conferencing technologies were often used for online interaction. The ability for the students to interact with the course instructors and other students during the live online sessions was regarded as valuable. The fact that the students could see the course

instructors discussing and giving examples improved their online learning experiences.

5.8.2.5 Collaboration tasks on Wikis

The FGD participants indicated that using collaboration tasks on Wikis was not commonly used as they learnt online through the Moodle LMS. This view was confirmed by the following excerpts from some of the participants;

I have seen Wikis on Moodle, but we have never used it. (FGDA6)

I have never heard about Wikis at all. (FGDC1)

There haven't been any tasks we have done on Wikis. (FGDD9)

I do not remember doing any work on Wikis, but I have seen it on Moodle. (FGDB10)

The Wikis feature of the Moodle LMS was not commonly used for collaborative tasks that would promote online interaction. The students indicated knowledge of the feature on the LMS but could not confirm its use.

5.8.2.6 Group tasks on Facebook

The FGD participants also confirmed that using group tasks on Facebook was rare in online learning. The viewpoint was confirmed by the following verbatim quotations from some of the participants:

There is no lecturer in all our courses who uses Facebook for teaching. (FGDD3)

I have not worked with colleagues on any task we did on Facebook. (FGDC2)

We just use Facebook for social interaction and not for learning. (FGDB7)

I do have a Facebook account, but I haven't used it for learning. (FGDA9)

It was also evident that the Facebook social media platform was not commonly used for learning. While some students confirmed that they had Facebook accounts and participated in Facebook social activities, they could not confirm the use of Facebook for learning.

5.8.2.7 Online research and presentation

The FGD participants also revealed that online research and presentation were rare practices as part of the online learning strategies. The point was confirmed by some of the participants in the following quotations:

We have not conducted any research activity online and did an online presentation of the findings. (FGDC10)

Yes, we do research, but this is not done online, and we do not do presentations online. (FGDA3)

No lecturer has given us some research work to do using the Moodle LMS. (FGDD5)

I do not remember us doing any research presentation on Zoom or any other web conferencing platform. (FGDB2)

It was established from the discussions that using online research and presentation was not a common practice in online learning. The students confirmed being engaged in research activities, but such activities were not conducted online, and research findings also needed to be presented online.

5.8.2.8 Creation of digital products or artefacts

The FGD participants also revealed that the creation of digital products or artefacts was not a common practice in online learning, and this was confirmed by the following verbatim quotations from some of the participants:

There hasn't been any task given to us on creating digital products or artefacts. (FGDA8)

I have never designed or developed any digital product on the Moodle LMS. (FGDC3)

I am not so sure what it is to create or develop a digital product in online learning. (FGDD2)

I have not developed any digital product. (FGDB8)

It was evident from the discussions that students were not exposed to the development of digital products or artefacts in online learning. The students could not confirm being provided with opportunities to create such products and did not remember creating any.

5.8.2.9 Online group projects

The FGD participants revealed that online group projects were not a common technique for online instruction. This view is supported by the following excerpts from some of the participants:

We have done group assignments, but we haven't done group projects online. (FGDB5)

I have not participated in any online projects done on Moodle. (FGDA5)

We do projects in some of our courses, but these projects are not done online. (FGDD8)

I have not worked on any online project from the first year until now. (FGDC6)

It was clear from the discussions that the students needed to be exposed to online projects. While some of the students confirmed the utilisation of group projects, such projects were not done online.

5.8.2.10 Online group practical activities

The FGD participants also indicated that using online group practical activities was rare in online learning, as experienced by the students. The view was supported by the following verbatim quotations from some of the participants:

We have not done any practical group activities on Moodle. (FGDC8)

There is no lecturer who has ever given us practical activities online. (FGDB4)

I have not participated in any online group practical activities. (FGDA2)

No, I have not worked with any of my colleagues on collaborative online practical tasks. (FGDD6)

It is clear that online group practical activities were not commonly used in online learning. The students needed to engage more in collaborative online practical activities in the different courses.

5.8.3 Triangulation of quantitative and qualitative findings

At this stage, the questionnaire and FGD findings are integrated, contrasted, and compared to look for any areas of convergence or divergence. An overview of the conclusions triangulated is presented in Table 5.17.

Table 5.17: Triangulation table of findings from quantitative and qualitative data

Findings (Quantitative data)	Findings (Qualitative data)	Areas of convergence/divergence
Discussion forums are confirmed as a common technique.	Participants in FGD confirmed the use of discussion forums	Both data sets converge on a discussion forum as a common technique
Group tasks on the WhatsApp platform were a frequently used technique.	Participants in FGD revealed that the use of group tasks on the WhatsApp platform was common	Both data sets confirm the use of group tasks on the WhatsApp platform as a common technique
Online group assignments are a frequently used technique.	Participants in FGD confirmed that the use of online group assignments was common	Both data sets converge in affirming the use of online group assignments as a common technique
Live online sessions were commonly employed.	Participants in FGD indicated that live online sessions were a common technique in online learning	Both data sets converge in affirming the common use of live online sessions
The use of collaboration tasks on Wikis was not a common technique.	FGD participants revealed the uncommon use of collaboration tasks on Wikis	Both data sets confirmed that the use of Wikis for collaborative tasks was uncommon
The use of group tasks on Facebook was rare.	FGD participants revealed the uncommon use of group tasks on Facebook.	Both data sets converge in confirming the use of group tasks on Facebook as uncommon.
The use of online research and presentation was not a common technique.	FGD participants revealed the uncommon utilisation of the online research and presentation technique	Both data sets cover the uncommon use of the online research and presentation technique.
The creation of digital products or artefacts was not a common technique.	FGD participants indicated the uncommon utilisation of the creation of digital products or artefacts online	Both data sets converge in confirming the uncommon use of the creation of digital products or artefacts
The involvement of students in online group projects was rare.	FGD participants did not confirm the common use of online group projects	Both data sets converge in confirming the uncommon use of online group projects
The use of online group practical activities was rare.	FGD participants did not confirm the common use of online group practical activities	Both data sets converge in confirming the uncommon use of online group practical activities.

5.8.4 Interpretation of the triangulation table

The results from the quantitative data revealed that the online discussion forum was a common technique in online instruction at the university under study. Similarly, the qualitative results confirmed the quantitative finding as the participants indicated how

commonly the technique was and how it benefitted them. Both data sets converged in establishing the utilisation of the online discussion forum as a common technique. Further, quantitative data also established that group tasks on the WhatsApp platform were a frequently used technique, and the same result was supported qualitatively through the FGD, hence the convergence of the two data sets in confirming the common use of group tasks on the WhatsApp platform. It was also quantitatively established that online group assignments were a frequently used technique, and the same result was found in FGD, where participants indicated how they were commonly involved in online group assignments. The two data sets complemented each other in establishing online group assignments as a common technique in online instruction. The quantitative component of the study also revealed that live online sessions were commonly employed as a technique, and the same result was confirmed qualitatively through the FGD. Both data sets complemented each other in establishing that live online sessions were a common technique for online instruction in the university under study.

The quantitative component of the study found the use of collaboration tasks on Wikis was found to be uncommon. The same finding was found on the qualitative aspect of the study as FGD participants indicated that they never participated in group activities on Wikis. The two data sets complemented each other in establishing that using Moodle Wikis was not common as a technique for online instruction. Similarly, the quantitative results revealed that using group tasks on Facebook was uncommon. The finding was supported qualitatively when the FGD participants indicated the social use of Facebook and could not confirm the use of the Facebook platform for academic purposes. The two data sets complemented each other in establishing that using group tasks on Facebook was uncommon. The quantitative findings showed that using online resources for research and presentation was not a frequent strategy. The FGD participants indicated they were not exposed to chances for online research and presentation, leading to the same qualitative finding. The quantitative and qualitative data sets complimented one another in determining how uncommon the strategy was in online training. Creating digital products or artefacts was not a common technique, as shown by the quantitative results and the qualitative findings from the participants, who stated that they were not exposed to the possibilities of designing and developing online digital products. Each data set added something to the other. The quantitative

results also confirmed that the use of online group projects was uncommon, and the same result was confirmed qualitatively, showing that both data sets converged on the result. Additionally, the quantitative results indicated that online group practical activities were uncommon, which was also confirmed qualitatively. Both data sets complemented each other in confirming how uncommon the technique was.

5.9 CONCLUSION

This chapter presented and analysed results from both quantitative and qualitative data. A structured questionnaire was administered to distance education students, and some of the students participated in FGD. Both data sets were collected concurrently in line with the concurrent triangulation design. The data sets were merged at the interpretation stage, drawing areas on convergence and divergence. The next chapter discusses the findings of the study.

CHAPTER SIX

DISCUSSION OF FINDINGS

6.1 INTRODUCTION

The researcher presented and analysed the study's findings in the preceding Chapter. To closely address the defined research objectives stated in section 1.5.1 of the first Chapter, the quantitative results were analysed and presented, followed by the qualitative findings. The two data sets were merged to establish convergence and divergence areas. The Chapter discusses the study's main findings. The results on students' understanding of interaction in online learning, the benefits derived from online interaction, how students were trained and supported for interaction in online learning, what promotes or hinders online interaction at the rural-based university, and the implications for online pedagogy are discussed against related findings in the literature and the theories underpinning the study. In the next section, the researcher discusses the study's findings relating to distance education students' understanding of interaction in online learning.

6.2 STUDENTS' UNDERSTANDING OF INTERACTION IN ONLINE LEARNING

It was found that the students knew that interaction in online learning involved working with others to do common tasks online. The students highlighted the issue of online group activity. This finding ties very well with Thurmond's (2003) definition of online interaction as involving the student's engagement with course content, fellow students and the course instructor. Furthermore, Cafferty (2021) confirms heightened interaction in an online environment by involving students in cognitively stimulating activities that allow them to work together in knowledge construction and sharing. The student's understanding of online interaction regarding collective group activities corroborated Goñi et al. (2020), who note teamwork as an essential teaching strategy and learning outcome in online teaching and learning.

The findings further revealed that distance education students viewed interaction as involving communication with other students in the virtual learning space. This finding confirms the assertion by Singh and Thurman (2019), as cited in Dhawan (2020), that interaction in an online learning environment entails students utilising different online means to reach out to others and enhance the online learning experiences. As

Alawamleh et al. (2020) noted, online students have reduced feelings of isolation through improved online communication. They are motivated to learn through the established connections through contact with fellow students.

It was found that distance education students understood interaction in online learning as involving creating and utilising online learning communities where the students would work together to achieve the desired learning outcomes. The finding confirms the views by Keaton and Gilbert (2020) that online interaction is about creating and sustaining virtual connections meant to guide and support students as they learn online as a community. Furthermore, Owen et al. (2021) note that utilising online learning communities is consistent with an open pedagogy that allows students to partner in supporting one another in the learning process.

The respondents and participants in the study viewed interaction in online learning as involving the ability to exchange learning resources with other students. This finding is consistent with the views of Lockee (2021), who argues that online learning has revolutionised teaching and learning as students can access and share different learning resources online. Similarly, in a study to understand the online learning experiences of participants in an online course, Dlamini et al. (2022) also found that the participants confirmed that they could access and share learning resources in different multimedia formats as they learned together online. The issue of exchanging learning resources online becomes an essential aspect of interaction in online learning.

It was also established that distance education students viewed online interaction as communicating with the course instructors. This finding corroborates views by Keaton and Gilbert (2020) that interaction in online learning involves the different ways of communication between the student and the course instructor, which is meant to assist the student in navigating the virtual learning space. When there is adequate and meaningful communication between the student and the course instructor, the students feel supported. They are more engaged in the online learning processes, leading to higher chances of learning persistence and success (Kotera et al., 2021). It is essential to note that the literature and the empirical study confirmed the interaction involving communication between students and instructors.

It was discovered that distance education students did not view interaction as how they accessed their course content online. This finding is inconsistent with the assertions by Barrot et al. (2021) that interaction in online learning involves the students' interaction with content. Using different technologies utilised for online learning teaching and learning the students access course content and participate in the learning activities. As further noted by McInnes (2019), students can access course content in online learning environments in different multimedia formats such as print, video and audio. The students are, therefore, expected to be able to access the course content and utilise it in meaningful learning engagements.

It was established that the distance students viewed interaction differently than how they got involved in learning course content. Such a finding was inconsistent with views by Barrot et al. (2021), who observe that as part of their interaction with online students, students interact with course content by being involved in the online learning activities drawn from the content. Engaging with online course content may require students to work collaboratively with others in threaded discussions, which promote critical thinking and the exchange of ideas (Sawant, 2021). Given the findings in this study, students must view interaction with course content as not merely accessing the content but involved in learning the content.

It was further established in this study that distance education students did not view online interaction in terms of their ability to navigate the LMS. This finding refutes assertions by Bradley (2021) that online students should be able to use the LMS to be meaningfully involved in online learning as independent students. To this end, interaction with the LMS becomes a prerequisite for effective participation in online learning. In a similar assertion, Mthethwa-Kunene et al. (2020) state that through the ability to navigate the Moodle LMS effectively, students can build and sustain online learning communities by utilising the available LMS affordances. The present empirical study did not confirm online students' understanding of interaction in terms of ability to navigate the LMS, yet this is an important finding established in the literature.

It was further found that distance students did not view their ability to use technological devices effectively as an aspect of interaction in online learning. This finding refutes the view by Van den Berg (2020) that the online students' ability to use technology is pivotal for success in online learning, hence the importance of student-technology

interaction in online learning. On the same vein, Haleem et al. (2022) noted the importance of creating a digital classroom through the students' ability to use technological or internet-connected gadgets such as laptops, tablets and Chromebooks as this enhances their participation in online learning. Similarly, Almaleki et al. (2021) underscore the importance of the students' ability to use online technology as the students use online technologies to learn collaboratively with others. The fact that online learning utilises specific technology calls for the need for digital literacy and competency of the students in using the technologies for learning by manipulating their devices.

It was also established that distance education students understood online interaction by getting online assistance from the course instructors in the learning process. The finding corroborates the views by Rotar (2022) that as online students utilise technology in learning online, they work closely with their course instructors, synchronously and asynchronously, obtaining the needed academic and social support. In a study that explored the experienced opportunities and threats of online students, Maphosa et al. (2022) found that online students reported positively about the meaningful, timeous and detailed support received from the course instructors. The vital attribute of online interaction of student support by course instructors, established in the literature, was also confirmed by participants and respondents in the present empirical study as constituting their understanding of online interaction.

In the next section, the researcher discusses the findings on the benefits derived by the students from interaction in online learning.

6.3 THE BENEFITS STUDENTS DERIVE FROM INTERACTION IN ONLINE LEARNING

The study found that the distance students indicated that they benefitted from interaction in online learning by being able to learn from each other. This finding confirmed findings in the literature, indicating the importance of interaction in online learning as students were provided opportunities to learn from each other (Allred, 2016; Phirangee, 2016). Furthermore, Almahasees et al. (2021) argue that online learning provides opportunities for student-centred learning in which the students take charge of their students in virtual learning spaces by learning from each other. Similarly, Adedoyin and Soykan (2020) state that online students utilise constructivist

approaches through student-centred approaches, constructing knowledge independently by learning from each other. Online students can also learn from one another through collaborative discourse (De Wever & Strijbos, 2021). The issue of students learning from each other in online learning, established as a benefit of online interaction from the present empirical study, buttresses similar findings in the literature.

The study found that distance education students indicated that they benefitted from interaction in online learning by learning together with others. This finding corroborates the findings in the literature that online learning provides students with opportunities to interact and learn together in performing online tasks (Athens, 2018; Berry, 2019; Gover et al., 2019). Furthermore, Wu et al. (2022) note that online students engage in collaborative reflection by learning together, allowing them to think together and express themselves openly, thereby learning by sharing experiences in collective knowledge construction. Furthermore, the finding also confirms the findings in the study by Nami et al. (2018), where interaction during collaboration fostered the co-construction of knowledge. The importance of providing opportunities for collaborative learning and building learning communities becomes a pivotal benefit of online interaction as conformed in literature and the present empirical study.

The study also established that the distance education students deemed it a benefit of interaction in online learning that they felt supported by the course facilitators. This finding is consistent with the assertion by Rotar (2022), who states that while distance education students are generally expected to be mature, motivated and goal-directed, they often lack such qualities and greatly benefit from sustained and well-planned support from the course facilitators. As further noted by Muljana and Luo (2019), a lack of student support in online learning results in barriers to learning and such barriers are only overcome by meaningful student support. Therefore, the finding in the present study that students benefitted from interaction with course facilitators, which provided them with much-needed support, confirms similar findings in the literature.

The study found that distance education students did not consider making the optimal use of the Moodle LMS as a benefit in terms of their interaction in online learning. This finding is inconsistent with the views by Van den Berg (2020) that interaction with technology was an important determining factor for effective participation in online

learning. Similarly, Van Wart et al. (2020) state that there are numerous factors affecting students' effective participation in online learning and the ability to utilise the technology used in online teaching and learning is one of them. As also emphasised by Kuloglu and Yildiz (2022), electronic learning utilises electronic devices, and online students can only acquire knowledge and skills by learning online if they can fully utilise the electronic devices and related technologies. Students should be able to utilise the LMS to access course content and participate in online learning activities.

The study further found that distance education students did not consider it a benefit of interaction in online learning, so they made the best use of the functions of their digital devices for learning. The finding confirms similar findings in the literature, which show how interaction with technology was often downplayed as an essential aspect of interaction in online learning (Al-Hariri & Al-Hattami, 2017; Van den Berg, 2020). In a study to establish the relationship between students' ability to use technology and academic achievement, Al-Hariri and Al-Hattami (2017) found a significant relationship, which suggests the importance of students' effective interaction with technology as a determining factor of meaningful participation in online learning.

The study further found that distance education students regarded it a benefit of online interaction that they received the necessary guidance regarding information about course content. The finding corroborates assertions by Watson et al. (2017) that the way the course instructor guides the online students by providing important explanations and clarification on course content is vital for the students' persistence in online learning. In addition, Costley and Lange (2016) stress the importance of heavy instructor presence in online teaching and learning as such presence supports and guides students and positively impacts students' performance and the achievement of learning outcomes.

It was further established in the study that the distance education students reported as a benefit of online interaction that course expectations were communicated to them by the online course facilitators. Such a finding is consistent with other findings in the literature. As Hasiri (2021) observes, the online students' course expectations should be identified, managed and fulfilled to minimise anxiety and confusion. When online students experience anxiety and confusion, they may drop out of the course. Furthermore, the online students' course expectations are varied, hence the need to

understand and address them (Demuyakor, 2020). Therefore, as the students interact with course facilitators in the online learning environment, they benefit from clear and meaningful communication of course expectations, as this is an important guide.

The distance education students also revealed that it was beneficial to participate in live lessons via video conferencing, such as Zoom, as it enhanced their online interaction. The finding confirms the views of Blau et al. (2017) that synchronous online learning provides opportunities for real-time interpersonal communication and interaction. As further noted by Ogbonna et al. (2019), students receive immediate feedback about their engagement in online learning activities in live online sessions. Interaction is also enhanced through web conferencing systems such as the BigBlueButton, which allows students to be engaged in chat messaging, live audio and video feeds the course instructors as well as interaction with other students (Mkhonta-Khoza & Rugube, 2021). Frequent synchronous learning sessions are, therefore, important for students' enhanced interaction in online learning.

The study further found that distance education students considered it a benefit of online interaction as they obtained valuable feedback from assessments. This finding is consistent with the views by Atkinson and Lim (2013) that feedback plays a critical role in online students' progress with learning. Similarly, Malecka et al. (2020) note that feedback in online learning enhances one-on-one interaction between the facilitator and the student when such feedback is timeous, detailed, descriptive, actionable and personalised. As further noted by Jensen et al. (2021), feedback is coaching, a dialogue and a learning tool in virtual learning environments. It is essential to note that students' online interaction with course facilitators should result in communication through feedback on their online work, as this guides the learning process and keeps the students focused on the online learning activities. Assessment should be considered an integral part of learning (Lubbe & Mentz, 2021).

In the next section, the discussion focuses on findings related to how students were trained and supported for interaction in online learning.

6.4 HOW STUDENTS WERE TRAINED AND SUPPORTED FOR INTERACTION IN ONLINE LEARNING

The study found that distance education students had yet to be trained in the general use of the Moodle LMS. This finding is inconsistent with the views by Bradley (2021)

that for effective online learning to take place, students should be trained on how to use the LMS effectively to monitor their learning progress. Similarly, Al-Fraihat et al. (2020) note that an LMS performs different functions, including allowing opportunities for collaborative learning, and it is vital for the students learning online to be trained on how to make great use of the LMS. Therefore, the finding in the present study that students need to be trained in LMS usage indicates a fundamental flaw in creating the necessary conditions for interaction in online learning.

The study further established that students had yet to be trained to use the LMS's interactive features, such as the discussion forum. The finding refutes assertions by Du et al. (2022) that student interaction is facilitated and sustained through meaningful participation in online discussion. It becomes a challenge for student interaction through online discussions when the students have yet to be trained to use the discussion forum on the LMS. On the importance of training students, Kurnaz et al. (2018) observe that online discussion promotes the students' active participation in learning and such participation is only realised if the students can prepare posts, edit posts, post on the forum and respond to other posts. This is only possible through deliberate training and exposure, without making assumptions.

The study found that distance education students must be trained to use interactive plug-in features like the Google Jamboard. Such a finding is inconsistent with the assertion by Kühl and Wohninsland (2022) that students who can use interactive whiteboards have enhanced online interaction and collaboration with other students and course facilitators. Similarly, Shi et al. (2018) note that students' self-efficacy and ultimate achievement in online learning are enhanced by their meaningful participation in collaborative work on the interactive digital whiteboards. It, therefore, becomes self-defeating to expect students to heighten their interaction and collaboration with others when they are not trained in using interactive technologies such as whiteboards.

The study also found that though distance education students were not trained in using social media for learning, they could use it and actually used WhatsApp for learning. This finding is consistent with arguments by Ansari and Khan (2020) that students' ability to utilise social media for learning enhances their chances for interaction with others and promotes active collaborative learning. On the issue of WhatsApp for learning, Durgungoz and Durgungoz (2022) note that students' effective use of

WhatsApp for educational purposes fosters teacher-student and student-student out-of-school interaction. Therefore, ensuring students can utilise social media for learning is a prerequisite for meaningful online interaction through social media.

The study found that distance education students had yet to be trained in using open educational resources (OERs). The students further indicated a need for more awareness of OERs and the ability to use them. The finding refutes claims by Christoforidou and Georgiadou (2022) that enhanced learning experiences in online environments. Similarly, Cummings-Clay (2020) states that the ability to access and utilise OERs in online learning allows students to access the required valuable learning resources meant to enhance learning. Training and supporting distance education students using OERs is vital in empowering students with knowledge and skills in accessing and using appropriate learning resources.

The study found that students needed support when facing technical challenges online. This finding fails to confirm that Pham et al. (2021) assert that online learning support should intensely focus on technical support for students as they navigate technology for meaningful learning. As further noted by Mayanja et al. (2019), interaction with content, fellow students and course facilitators is vital in online learning, and such interaction is possible when students can utilise technology. In their use of technology in online learning, students may face technical challenges, and there should be readily available technical support to assist them in troubleshooting the challenges. It becomes a cause for concern that it was established in the present study that students needed more technical support as they participated in online learning. This had substantial implications for the nature and extent of interaction for meaningful online learning.

It was found in the study that distance education students were supported when they sought clarity on course content issues. The finding corroborates earlier findings by Richardson et al. (2016) that in virtual learning environments, it was imperative for course facilitators to be visible and engage students in the teaching and learning process by offering all forms of academic support. In addition, Zuhairi et al. (2020) note the importance of systematic and sustained online academic support for online students. Online students should receive the necessary support as they interact with course content.

The study also established that students were supported when they sought clarity on online assessment tasks. The finding is consistent with views by Domínguez-Figaredo et al. (2022), who observe that there is a need to clarify assessment expectations for online assessment activities and that students should have opportunities to seek clarification as they engage with online assessment activities. There are numerous challenges associated with online assessments that the students take online, and there is a need to provide adequate support for such students (Gil-Jaurena et al., 2020). To this end, online interaction extends to how online students engage with online assessment and the support they receive in the process.

The study also found that the students received support in online groups, that is, online learning communities. The finding is consistent with views by Fiock (2020) that online students participate well in online learning communities when the course facilitators clarify roles, responsibilities and expected codes of behaviour of members in the learning community. Students should receive clear expectations regarding the learning community learning tasks. Support from course facilitators and fellow students in online learning community work assists students to be motivated and persist with their studies (Hilliard & Stewart, 2019). Instances in which students feel supported in online group activities invariably address isolation and frustration, which may result in online students opting out of courses. Such support connects students to the course facilitators and fellow students, which is vital for enhanced online interaction.

The study found that students felt that they needed to be supported in accessing relevant learning material in the learning process. This finding must be consistent with one of the tenets of connective learning, which is connecting students with learning resources (Siemens, 2005). The two principles of connectivism, that learning and knowledge rest in a diversity of opinions and that learning is a process of connecting specialised nodes or sources of information, as advanced by Siemens (2005), provide clear indicators of the importance of connecting online students to information sources. The online instructor's role is to provide resource repositories or links to information for the students to obtain access to information necessary for online learning. The finding in the present study is a cause for concern as failure to connect students to information compromises the quality of online teaching and learning experiences.

Having discussed findings regarding the training and support provided to distance education students in online learning, the following section discusses findings on factors promoting or hindering interaction in online learning.

6.5 FACTORS THAT PROMOTE OR HINDER INTERACTION IN ONLINE LEARNING

It was established in the study that it was a promoting factor for online interaction that students were willing to work collaboratively with others. This finding is consistent with views by Straub and Rummel (2020) that interaction in online learning is enhanced when students become active participants in the learning process by working collaboratively to co-construct and share knowledge. As further noted by Husain (2020), through involvement in collaborative tasks, online students apply higher-order skills in line with Bloom's digital taxonomy of educational objectives and may create and publish digital products. The realisation in the present study that students were willing to work collaboratively with others shows that the students were predisposed to interaction.

The study found that having properly structured course content on the LMS with clear expectations was a factor in fostering online interaction. A well-defined course framework makes it easier for students to know what to expect from the course and what is expected each week, lowering anxiety and enabling them to plan better and manage their time (Oswal & Meloncon, 2014). Yang (2017) adds that responsive online course design strategies produce structured courses that make it easier for students to follow the course's steps and achieve the intended learning results.

The study found that students disapproved that course facilitators/instructors were always available to support students. Such a finding is contradictory to findings by Dlamini et al. (2022) that online learning course participants had positive and rich online learning experiences because facilitators were available online to assist students. The availability of the course facilitator online guarantees 'visibility', which is essential in promoting the much-needed instructor presence in online learning (Lee, 2020). The finding in the present study of limited or non-existent instructor presence negates the promotion of interaction in online learning, as instructor presence is vital for enhanced online interaction.

The study further established that the course facilitators/ instructors needed to provide opportunities for collaborative learning. Such a finding is quite profound as it has implications for online pedagogy and the nature and extent of interaction in online learning. The finding also negates views by proponents of effective online teaching and learning who advocate engagement, collaboration and interaction in virtual learning spaces (Bates, 2020; Farrell & Brunton, 2020; Keaton & Gilbert, 2020). It is important to note that interaction in online learning is only possible and heightened by utilising appropriate online pedagogies that allow online students opportunities for collaboration. Such approaches enhance the students' online learning experiences (Dlamini et al., 2022; Maphosa et al., 2022).

The study also established that students experienced unreliable internet connectivity. This finding is consistent with the literature findings, which confirmed internet connectivity challenges as negatively affecting online learning in African higher education systems (Aboagye et al., 2020; Asio et al., 2021). Similarly, Cullinan et al. (2021) note that the digital divide in most developing countries, evidenced by the vast disparity between students with access to high-quality broadband connectivity and those without, is vast. As further noted by Jordaan (2020), during the initial COVID-19 lockdown in South Africa, about half of the university students needed access to data to connect to the internet, so they could not effectively study online. The issue of reliable internet connectivity is a significant determining factor for effective online learning, and in instances where internet connectivity is unreliable, it becomes a cause for concern.

The study found that students were self-motivated to learn from one another. Such a finding was an important one and corroborates findings in the literature. Straub and Rummel (2020) noted that online learning provides students with opportunities for collaborative learning. In such an approach, the students are not passive receivers of information but are active students who work in pairs or small groups to co-construct and share knowledge (Straub & Rummel, 2020). As students work and learn together in virtual learning spaces, they may be predisposed to achieving higher-order skills in line with Bloom's digital taxonomy of educational objectives, where they show high abilities, such as creating and publishing (Husain, 2020). By working together in a technological environment, students learn and practise to apply knowledge and solve problems; these are essential graduate attributes in the 21st century.

The study found that students did not look down upon each other in online learning. This finding confirms similar findings in the literature that through the social-cultural approaches, students learn together collaboratively (Amrullah & Zahratun, 2022). Bates (2019, p.19) also notes that in line with the sociocultural theory, "knowledge and interactions are constructed through social interactions with families, friends, teachers, and peers". Therefore, by interacting with fellow students, there is an exchange of knowledge, which allows students to learn from each other and enhance their online learning experiences.

It was also established in the study that it was a hindrance to online learning that there were delays in providing immediate feedback by course facilitators. Such a finding is inconsistent with views by Jensen, Bearman and Boud (2021, p. 2) that online learning is often "a remote and solitary activity" and, therefore, requires prompt and meaningful feedback by utilising available technologies for immediacy, expediency and connectedness to learning. To this end, feedback becomes an essential aspect of scaffolding for learning by providing students with the necessary support to achieve the set learning outcomes (Cavalcanti et al., 2021). Therefore, to establish, in the present study, that students experienced delayed feedback in their online learning is indicative of pedagogical deficiencies as various forms of assessment and feedback, therefore, should be embedded in online course design, and different LMSs have tools that could be utilised for instant and meaningful feedback.

The study further established a need for more support from course instructors as a hindrance to online learning. The finding supports the views by Lee (2020) that an online course facilitator has a critical role in ensuring student engagement and interaction in online learning. Similarly, Zulfikara et al. (2019) note that facilitators work more to support students in an online learning environment than support provided in a face-to-face environment. There should be the teacher's presence in a virtual learning space, and this involves the facilitator regulating and threading discussions, among many other online roles. Therefore, online learning needs to improve in instances of perceived or actual lack of support for students by course facilitators.

The study also found that students incurred huge data costs for online activities, negatively affecting online learning initiatives. The finding corroborates findings by Budiman (2020) that online learning could be expensive for students who require data

to access synchronous and asynchronous online learning activities and hence the attempts by some universities in Indonesia to support students with data. Similarly, in South Africa, Lumadi (2021) avers that student support in ODeL should be extended to ICT support. However, ICT support should be about more than just students' ability to utilise technology central to online learning but access to appropriate devices and data packages. To this end, there is a need for institutions of higher learning to support students to have access to data for online learning.

The study also found that students needed to gain appropriate technological skills, which was deemed a hindrance to online learning. Studies in the literature have buttressed the challenge of the digital divide as an impediment to meaningful online learning (Brodie, 2018). All students should possess functional technical competencies to navigate the LMS and can utilise the LMS by performing essential functions such as logging onto the LMS and downloading and uploading material. A scenario where some students need more basic technological skills to operate the LMS becomes challenging since an LMS is a digital learning platform that allows online students to be involved in the co-construction of knowledge (Chang & Kuo, 2021). Students should also be able to participate in online discussions to share ideas with other students and to explore several viewpoints from their mates as an element of online collaborative learning (Mtshali et al., 2020).

This section discussed findings regarding the factors that promote or hinder interaction in online learning. The following section discusses findings on implications for online pedagogy at the rural-based university.

6.6 IMPLICATIONS FOR ONLINE PEDAGOGY AT THE RURAL-BASED UNIVERSITY

The study found that most respondents indicated using discussion forums as a standard pedagogical tool. Such a finding is consistent with findings in the literature, which confirm the importance of the discussion forum in enhancing interaction in online learning. A discussion forum is a crucial technique for encouraging interaction in online learning. It provides students a forum to interact meaningfully with their classmates and teachers, enabling them to ask questions, share ideas, and talk about the course material (Lima et al., 2019). Through discussion forums, students can collaborate on projects, get comments from their peers, and build a feeling of community, and such

forums can facilitate a more interactive and engaging learning environment by giving students a place for peer interaction (Kilinc & Altinpulluk, 2021). As further noted by Du et al. (2022), online discussion forums are a powerful tool for enhancing student interaction. In the present study, discussion forums were not adequately utilised, which has implications for the pedagogical richness of online learning in the university under study. The importance of discussion forums in promoting interaction in online learning, critical thinking and problem-solving abilities, and allowing students to communicate virtually with one another and their course instructors should be emphasised (Davis, 2021).

The study established that course facilitators did not commonly utilise the Wikis tool. Such a finding is a cause for concern as it reflects that opportunities for interaction were not exploited through the readily available digital tools on the Moodle LMS. Sula et al. (2021) noted that a wiki is a web-based tool that allows students to work collaboratively on a single document and build a corpus of knowledge by working together. As also noted by Sula and Sulstarova (2022), through wikis, students learn collaboratively by participating as authors of knowledge and not mere consumers of it. The use of Wikis promotes the attainment of higher-order learning outcomes, and it becomes a concern to note that such a helpful tool should have been utilised in online learning in the university under study.

The study discovered that the utilisation of group problem-solving exercises was uncommon. This contradicts research findings that advocate for students' deep engagement in the learning process. Students are given opportunities to attain higher-order learning goals through collaborative problem-solving activities, where they can generate original ideas, explore concepts, and apply new information to solve issues in a technology setting (Holz, 2017). Online collaborative learning strategies incorporate groupings of students who work in significant numbers of groups (Ajayi & Ajayi, 2020).

The study found that it was common for the students to be provided with group tasks to work on the WhatsApp social media platform. This finding is consistent with similar findings in the literature that confirm the abundant use of social media platforms, such as WhatsApp, for learning. Suárez-Lantarón et al. (2022), for example, do acknowledge that WhatsApp is the leading instant messaging application in the world

at the moment. Similarly, Baishya and Maheshwari (2019) note that students mainly possess mobile smartphones and can interact with online learning by collaboratively working on some assigned work. The use of the WhatsApp application for learning confirmed in the current study is in sync with views about WhatsApp use in online learning.

The study found that the use of group tasks on Facebook was rare, which **was** inconsistent with the literature findings. As Ulla and Perales (2021) noted, Facebook is one of the most popular social media sites that connects students and is easily incorporated into online learning. As noted by Todorovic et al. (2021), the Facebook platform is ideal for collaborative learning and student support, as course facilitators can bring students together and provide them with opportunities to work together while supporting them during the learning process. It is a concern to realise that popular social media sites such as Facebook were not utilised for learning in the current study. However, social media platforms are cheap and convenient ways of obtaining and sharing information (Ansari & Khan, 2020).

The study also revealed that online education did not commonly apply the research and presentation method. This finding does not support research-based findings that advocate for students' meaningful engagement in learning to promote active and deep learning (Sugeng & Suryani, 2018). The use of deep learning methodologies impacts the instructional design skills of the course teacher, as further observed by Sugeng and Suryani (2018). High levels of student engagement result from their participation in the learning process, a sign of good online teaching and learning (Thomas et al., 2022).

The study also discovered that participating in group artefact creation was unusual for students. According to Pishchukhina and Watson (2021), since analysis is at the top of the levels of the Revised Bloom's Taxonomy of Educational Objectives, students need access to online tools for producing digital content. Similarly, Haleem et al. (2022) point out that a substantial investment in technology tools for product creation and publication is necessary for online learning to be robust. Course designers and facilitators must grasp the pedagogical consequences of including students in creating digital products in online learning.

The study also found that using online group tasks was a common strategy. This result is consistent with similar outcomes reported in the literature supporting online collaborative tasks. As Costley (2021) mentioned, online group projects allow students to discuss and carry out various roles in collaborative activities to accomplish shared results. The use of pedagogical strategies by course instructors should enable students to engage with one another and the course material in meaningful ways that increase their motivation to learn (Swanson et al., 2019). Hence, online group tasks are crucial for encouraging cooperation and shared accountability in online learning.

The study also revealed that group projects were different from a typical method of instruction. The results are consistent with guidelines for effective online instruction, which, according to Chen and Yang (2019), should encourage group work and study groups and expose students to possibilities for group problem-solving through participation in group projects. Online group projects encourage creativity through involvement in an online creative collaborative group, as Raymundo (2020) emphasises.

Furthermore, it was found that using online group practical tasks was uncommon in the current study. The result does not support findings from previous studies in the literature that stress the value of utilising the online learning environment for practical activities. Online learning must transition its laboratory-style practical sessions to an online format (Khan et al., 2021); similar to this, Campos et al. (2020) highlight that various computer tools, apps, and software are used to reflect real-life circumstances and that simulation involves students in crucial practical activities, bridging the gap between theories and practice.

The study also confirmed that using live classes on video conferencing services like Zoom was widespread. This result supports related research that indicates the value of live online instruction in fostering interaction. Live online instruction using various web conferencing technologies improves synchronous and asynchronous classroom interaction (Al Hashimi, 2020; Mkhonta-Khoza & Rugube, 2021). Web conferencing tools like Zoom enable students to work in split groups, which improves student-student interaction in the virtual learning environment, as Toscu (2023) supports. Using live online sessions is a crucial strategy to improve interaction in online learning.

Having discussed findings regarding the common pedagogical approaches and their implications for interaction in online learning, the following section links some key findings of the study to the theories underpinning the study.

6.7 LINKING THE FINDINGS TO THE THEORETICAL UNDERPINNINGS OF THE STUDY

In this section, the discussion of findings is extended to a relationship with theories underpinning the study, as discussed in sections 2.5 and 2.6 of the second Chapter. The purpose is to gain a deeper understanding of the findings against the dictates of the chosen theories, namely, the Col framework and connectivism. Figure 6.1 summarises critical issues in the discussion.

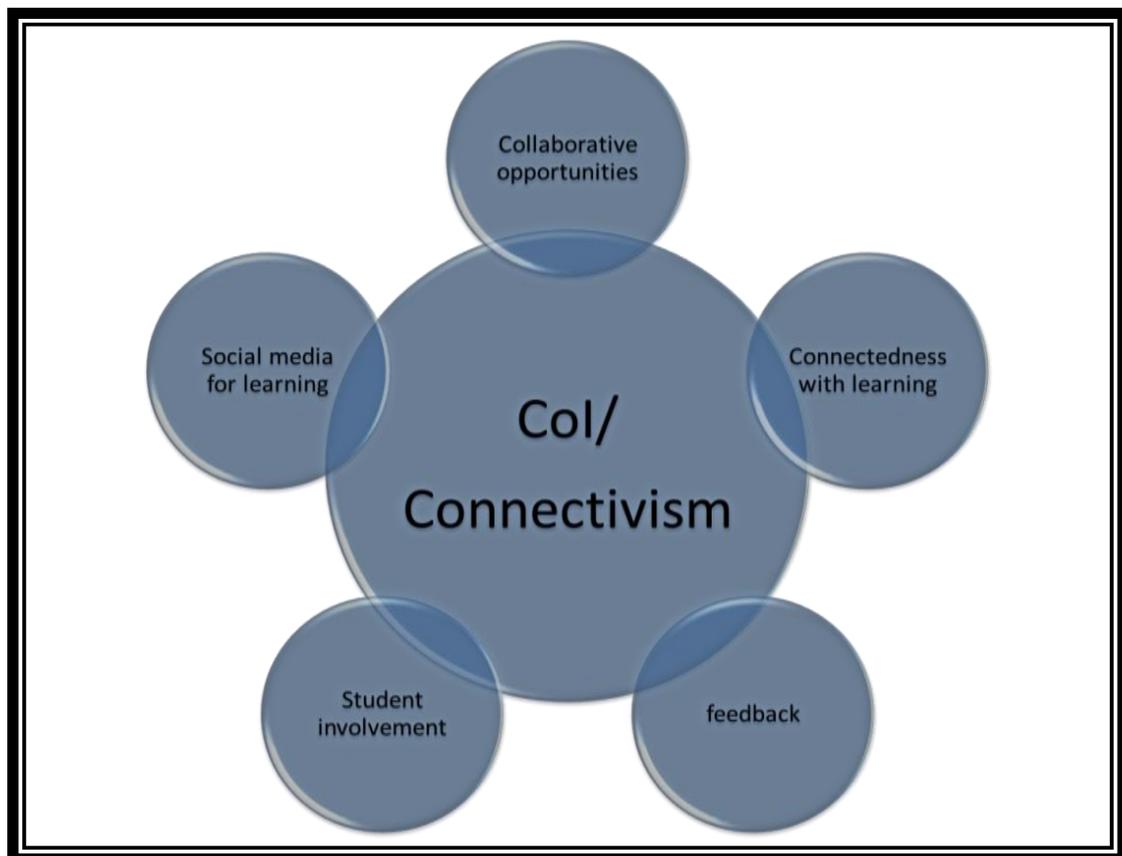


Figure 6.1: Linking findings to the theoretical underpinnings

6.7.1 Collaborative Learning Opportunities

Central to interaction in online learning is collaborative learning. The study found that students were provided with opportunities for collaborative learning in the online environment. The Col framework emphasises the social presence in which students must relate with an online learning community and develop interpersonal connections

in learning together (Garrison, 2009, p. 352). Well-planned and consistent interaction demonstrates social presence in online learning (Whittle et al., 2020). Student engagement is defined as the student's multifaceted connections that impact the student's progress and achievement (Kahu et al., 2014). Hence, the course instructors should use online pedagogies that encourage and nourish the student's connection to his or her studies.

The issue of forming connections in learning is the hallmark of connectivism as an online learning theory. As Hehir et al. (2021) noted, students need to be connected to others in the online learning process to address the loneliness and solitude often associated with online learning. In forming learning communities, the students learn together and consider the diversity in their learning preferences, strengths and limitations (Thoib, 2021). By drawing on their knowledge and experience, students can learn from one another by exchanging ideas. The more knowledgeable people help, the less knowledgeable; learning is a win-win situation (Thoib, 2021). One of the principles of connectivism states that learning and knowledge rest on diverse opinions (Siemens, 2005; Siemens & Downes, 2009). Therefore, the importance of online collaborative learning as espoused in connectivism must be considered. To this end, the findings of the study regarding the existence of collaborative learning opportunities are closely linked to the two theories informing the present study.

6.7.2 Connectedness with learning

The results in sections 5.5 and 5.8 of the fifth Chapter highlight the issue of connectedness with learning. The issue of connectedness resonates well with the two theories underpinning the present study. The essence of the CoI framework is building learning communities and foregrounding connection by building in the three 'presences' in online learning. As observed by Martin, Wang and Sadaf (2018), in line with the CoI framework, students "should be there" in the virtual learning environment, and the course facilitator should have a sense of interacting with real people, with students connecting and enhancing the online learning experiences.

According to connectivism, learning connects specialised nodes of information sources (Siemens, 2005). Students are connected to their digital technologies and, in turn, utilise the technologies to connect to knowledge sources. What it means to learn in the digital age, therefore, is the capacity to link data and information sources and

derive meaning from that data (Utecht & Keller, 2019). As further noted by Cleary (2021), connectivism relies on distributed knowledge rooted in networks of connections established from experience and interactions between individuals, society, organisations, and the technology that links them rather than being in a single location. The issue of connectedness with learning is an essential aspect of connectivism, also established in the present study. A link is, therefore, drawn between the study's findings and the theory underpinning the present study.

6.7.3 Feedback in the online learning process

The feedback issue in section 5.7 of the fifth Chapter links very well with aspects of the teaching presence in the Col framework. Providing timely and meaningful feedback is an essential requirement in promoting teaching presence in online learning. The importance of feedback on online learning is buttressed by the view that connecting new knowledge to what students already know and constructing new knowledge are both facilitated by feedback (Geitz et al., 2015). The online facilitator should, among other issues, be able to provide feedback to students in ways that allow the students working online to progress with learning without any challenges (Jensen et al., 2021). Therefore, challenges with managing feedback in an online learning environment negatively impact online learning.

One of the principles of connectivism states that learning and knowledge come from various ideas (Siemens, 2005). The preceding statement implies that students engage with others in an online learning environment and would require the course facilitator's input to exchange ideas through online group discussion. As further noted by Boyraz and Ocak (2021), as the students are involved in collaborative, student-centred and self-regulated learning online, there is a need for an active role by the course instructor to provide feedback timeously, and such feedback could be built through affordances of the LMS to offer automatic responses for students.

6.7.4 Student involvement in online learning

It is also clear from the study's findings, especially from the results in section 5.8 of Chapter 5, that student involvement is vital in the different pedagogical approaches utilised to promote interaction in online learning. The findings confirm the principles of the Col framework, which underscore the need for student involvement in creating and participating in online learning communities. According to the connectivist learning

theory, the learning process is in the hands of the students as active participants in the online learning environment (Utecht & Keller, 2019).

The aspect of student involvement also draws from connectivism, which advances the view that students learn from their technological devices and that "decision-making is itself a learning process" (Siemens, 2005, p. 25). The students are involved in decision-making in the learning process and are empowered to take ownership of learning. Connectivism encourages group conversation and collaboration, allowing for various points of view and perspectives to help in problem-solving, decision-making, and understanding information (Cleary, 2021). Pedagogical approaches, found in everyday use in the present study, assisted in promoting problem-solving and fostering understanding of information.

6.7.5 The utilisation of social media for learning

The study's findings, as established in the results in section 5.8 of Chapter 5, indicate the critical role of social media in online learning. Such findings relate well with the social and cognitive 'presences' of the Col framework, which informed the present study. Using different social media platforms, students can create, share and publish content in varied multimedia formats such as plain text, videos, music, or photographs (Wickramanayake & Muhammad, 2018). The cognitive presence is promoted by allowing students to exchange information (Garrison et al., 2001). The utilisation of social media platforms allows this important online exchange of information in the learning process.

Social media platforms such as WhatsApp and Facebook feature prominently in connectivism. As students participate in social media groups, they form the needed networks for learning. Most youths and young adults who own mobile smartphones spend most of their time on social media platforms such as WhatsApp (Suárez-Lantarón et al., 2022). Information is easily shared through social media platforms as students can easily engage in discussion with others online through such platforms (Utecht & Keller, 2019). It is, therefore, imperative to utilise social media platforms in pedagogical ways to involve students in meaningful online learning (Ananga, 2020).

6.8 CONCLUSION

In this Chapter, the focus was on a detailed discussion of the study's findings. The researcher discussed the findings as they related to similar findings in the literature. The discussion of findings centred on results on the students' understanding of interaction, the benefits derived from online interaction, how students were trained and supported for interaction in online learning, what promoted or hindered online interaction at the rural-based university, and the implications for online pedagogy. Furthermore, the research discussed the study's findings in light of the two theories underpinning the study: connectivism and the Col framework. The next Chapter provides a summary, conclusions, and study recommendations.

CHAPTER SEVEN

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

7.1 INTRODUCTION

In the previous Chapter, the researcher discussed the study's findings by referring to established literature and the selected theories underpinning the study. In this Chapter, the researcher provides an overview of the whole research study, draws conclusions from the findings, and makes some recommendations. In this Chapter, the researcher also reviews all the study's chapters. In line with the study's findings, the researcher further shows how the study's objectives were met. The researcher also handles the study's limitations and suggests further research.

7.2 SUMMARY OF THE THEORETICAL FRAMEWORK

The second Chapter of the study was devoted to a critical discussion of the two theories selected as theoretical underpinnings of the study. The first theory discussed is the connectivist learning theory (see section 2.5), and the second one is the Community of Inquiry (COI) framework (see section 2.6). The connectivist learning theory by Siemens (2005) was discussed by foregrounding the principles such as students' connection to fellow students, course instructors, resources and technology. The theory was applied to the present study regarding the elements of connectedness, as highlighted in Figure 2.2, Section 2.5.1.2. Emphasis was placed on how interaction in online learning, as informed by connectivism, is premised on the student's connectedness with technology, learning sources, digital learning platforms, fellow students and course instructors. The Community of Inquiry framework was discussed by highlighting the interplay between the three 'presences': social, cognitive and teaching. The framework was also applied to the present study by discussing the implications of the three 'presences' to promoting interaction in online learning.

7.3 SUMMARY OF THE LITERATURE

The third chapter of the study was devoted to a detailed literature review discussion. The literature review was aligned with the sub-research questions of the study to ensure relevance and relatedness. The first aspect of the literature review was understanding the concept of interaction (see section 3.3), and the different types of interaction were reviewed (see section 3.3.3). The literature was also reviewed on the

benefits of interaction in online learning (see section 3.4). Section 3.5 of the third chapter reviewed the literature on student training and support for interaction in online learning. The literature also reviewed factors promoting or hindering interaction in online learning (see section 3.6). The pedagogical implications of interaction in online learning were reviewed by tracing some online teaching and learning approaches (see section 3.7). The review of the literature was extended to discussing the global, national and institutional policies influencing online teaching and learning (see section 3.8).

7.4 SUMMARY OF THE METHODOLOGICAL PROCESSES AND PROCEDURES FOR THE STUDY

The study's fourth chapter was devoted to a discussion and justification of the methodology's steps and practices. The research paradigm used for the study was post-positivist. A mixed-methods research approach was followed, and a concurrent triangulation design was utilised. According to the research methodology, quantitative data was gathered using a well-structured questionnaire from a stratified random sample of 361 students. The sample was sufficiently representative to allow generalisations about the population because it represented 20%. Of the 361 questionnaires sent out, 338 were completed and rendered analysable. The return rate was 94%. The structured questionnaire allowed the researcher to collect simple quantitative data. The survey was carried out online using Google Forms. The reliability and validity of the study instrument were enhanced using the pilot test and Cronbach's alpha computation. SPSS software Version 29 was used to analyse the data. Descriptive statistics were used to analyse the data and provide an answer to the sub-research question. Ethics-related concerns such as study permission, ethical clearance, and informed consent were handled, as indicated in Section 4.10 of the third chapter.

Data from four focus groups of ten students each were gathered for the study's qualitative component using an FGD protocol. From four programs with the most active courses on the Moodle LMS, the FGD participants deemed "information-rich sources" were chosen using the purposive sample technique. In section 4.7.2.2 of the fourth chapter, the FGD's administration is specifically covered. The qualitative information obtained from the FGD was analysed using the theme content analysis technique described in section 4.8.2 of the fourth Chapter. As described in section

4.9.3 of the fourth chapter, steps were taken to improve the study's qualitative data quality.

The fifth chapter of the study presented and analysed the results of the study. Section 5.2 of the chapter presented results on the biographical details of the respondents. Section 5.3 presented results on the biographical details of the participants in focus group discussions. Section 5.4 presented results on the first sub-research question of the study, students' understanding of interaction in online learning. Section 5.5 presented the benefits students derived from interaction in online learning, whilst section 5.6 presented results on how students are trained and supported for interaction. Section 5.7 presented results on factors that promote or hinder interaction in online learning at the rural-based university, and section 5.8 presented results on the implications for online pedagogy at the rural-based university. In each section, the quantitative results were presented first, followed by the qualitative results, and at the end of each section, a synthesis was done for the quantitative and qualitative results.

The study established that the students generally understood interaction in online learning in terms of collaboration, communication with course instructors and fellow students, working in communities, exchanging information, and sharing resources. The students did not view interaction as one's ability to use technological devices, navigate the LMS, access online content, and participate in online learning. Evidently, interaction with technology was not viewed as an aspect of interaction.

It was found that there were numerous advantages that students reported deriving from online interaction. These advantages included the chance to collaborate, learn from others, have clarity on course requirements, receive feedback, and improve interaction through live online sessions with Zoom. However, the LMS and the affordances of their gadgets were only partially utilised by the students, who admitted that they did not feel they benefited from the experience.

It was also established that students needed more training on using the LMS in general or interactive elements, such as its discussion forum and wikis. Students also complained about needing more instruction on how to use interactive plug-in features like Jamboard, how to use social media for learning, or how to use open educational resources (OER). The study further found that students felt they needed more support when they encountered technical challenges in online learning and accessing learning

material on the online learning platform. However, students received support when seeking clarification on the course content and assessment tasks and when participating in online groups.

The study further identified certain factors that were confirmed to promote online interaction. The contributing factors were the availability of possibilities for collaborative learning, the openness of other students to contribute, the availability of suitable technology tools for online learning, and the appropriate structuring of course content. Online interaction was hampered by several factors, including the inability of some course instructors to provide ongoing online support, delays in giving immediate feedback, weak network connectivity in some locations, exorbitant data costs, and a lack of cutting-edge technological know-how.

The study also established that various online teaching techniques were often used, such as discussion boards, group assignments on WhatsApp, online group projects, and live online sessions. Some rare strategies include Wikis, Facebook, online research and presentation, the development of digital products or artefacts, student participation in online group projects, and online group practical activities. The implications for online pedagogy were twofold: interaction in online learning typically took the form of lower-order forms of interaction, and there was no way at all to use online pedagogies for interaction to promote higher-order skills.

The sixth chapter engaged in a detailed discussion of findings. Section 6.2 discussed the findings relating to students' understanding of interaction in online learning by linking the findings to what was obtained in the literature. Section 6.3 discussed the benefits students derived from interaction in online learning, and section 6.4 discussed how students were trained and supported for interaction in online learning. Section 6.5 discussed findings on the factors that promoted or hindered interaction in online learning. Section 6.6 discussed the implications for online pedagogy at the rural-based university by assessing the common approaches utilised in online learning. Given the theoretical underpinnings of the study, section 6.7 linked the findings to the theories informing the study, namely, the Community of Inquiry framework and connectivism.

7.5 SYNTHESIS OF THE RESEARCH FINDINGS

The research methodology, data analysis, interpretation and discussion were handled in the previous section. The similarities and contrasts between the results of the

empirical investigation and the literature review are discussed in this section. The empirical study's findings and those from the literature review shared some similarities.

On the students' understanding of interaction in online learning, the study found that the students generally understood interaction in online learning in terms of collaboration, communication with course instructors and fellow students, working in communities, exchanging information, and sharing resources. The same findings were confirmed in the literature as discussed in section 6.2 (Alawamleh et al., 2020; Cafferty, 2021; Donoso & Miranda, 2020; Goñi et al., 2020; Keaton & Gilbert, 2020; Lockee, 2021). It was also established empirically that the students did not view interaction in terms of one's ability to use the technological devices, navigate the LMS, access online content and participate in online learning, and the finding that interaction with technology was not viewed as an aspect of interaction was also confirmed in the literature in section 6.2 (Bradley, 2021; Barrot et al., 2021; McInnes, 2019; Sawant, 2021; Van den Berg (2020). Issues of collaboration and student engagement in students' understanding of online learning resonate with issues in the Community of Inquiry framework and the connectivist theory, where the online learning community is essential in developing interpersonal connections in learning together (Garrison, 2009; Thoib, 2021).

According to the study, there were numerous advantages for students as they interacted online, including the chance to collaborate, learn from others, understand course requirements, obtain feedback, and improve interaction through live online sessions with Zoom. Literature (Adedoyin & Soykan, 2020; Allred, 2016; De Wever & Strijbos, 2021; Rotar, 2022; Wu et al., 2022) has supported the conclusions that were described in Section 6.3 of the preceding chapter. The study also found that the students needed to fully utilise the LMS and the devices' capabilities, leading them to believe they missed the full benefits of their interactions with technology. The results were supported by the literature, which was discussed in section 6.3 of the previous chapter and showed the significance of students interacting with technology as a prerequisite for online interaction (Al-Hariri & Al-Hattami, 2017; Kuloglu & Yildiz, 2022; Van den Berg, 2020; Zhang & Liu, 2020).

Furthermore, the study discovered that neither the LMS nor its interactive elements—such as wikis and discussion forums—were adequately explained to students.

Students also complained that they did not get sufficient guidance on using social media for learning, interactive plug-in features like Jamboard, or open educational resources (OER). The results were in line with the issues raised in the literature, which were described in section 6.4 of the previous chapter and demonstrate the significance of preparing students for online learning (Bradley, 2021; Cummings-Clay, 2020); Du, Wang, Wang & Xiao, 2022; Durgungoz & Durgungoz, 2022; Kurnaz et al., 2018; Shi et al., 2018). The study also found that students did not feel supported when they encountered technical issues with online learning or trying to access course materials on the online learning platform. The result resonates with issues from the literature highlighting the need for student support, as stated in section 6.4 of the previous chapter (Mayanja et al., 2019; Pham et al., 2021; Siemens, 2005).

It was also found that particular factors that promoted online communication. A few factors that contributed were the availability of opportunities for collaborative learning, the willingness of other students to engage, the accessibility of appropriate technology tools for online learning, and the practical organisation of course content. There were similarities between the empirical findings and findings in the literature, as discussed in section 6.5 of the previous chapter (Husain, 2020; Oswal & Meloncon, 2014; Straub & Rummel, 2020; Yang, 2017). Weak network connectivity in some locations, exorbitant data costs, a lack of cutting-edge technological know-how, and the inability of some course instructors to provide ongoing online support were among the factors that hindered online interaction. The same findings were confirmed in the literature as discussed in section 6.5 of the previous Chapter (Aboagye et al., 2020; Asio et al., 2021; Budiman, 2020; Cullinan et al., 2021; Jordaan, 2020; Lumadi, 2021).

The study also established that some techniques were commonly utilised for online learning, and some were uncommon. The implications for online pedagogy were that there was no way to use online pedagogies for interaction to enhance higher-order abilities and that interaction in online learning often took the shape of lower-order types of interaction. The findings are consistent with issues raised in the literature that were covered in section 6.6 of the prior Chapter (Davis, 2021; Du et al., 2022; Lima et al., 2019; Sula & Sulstarova, 2022; Thomas et al., 2022; Ulla & Perales, 2021).

7.6 CONCLUSIONS ON THE RESEARCH QUESTIONS

The study sought to explore the distance education students' experiences of online interaction at a rural-based university in Eswatini. The main research question and five sub-research questions were stated in chapter 1 (Sections 1.4 and 1.4.1). In this section, the researcher addresses the conclusions from the findings on the sub-research questions, which were meant to answer the main research question. After the sub-research questions have been addressed, the main research question will be discussed.

7.6.1 How do students understand interaction in online learning?

Based on the findings regarding students' understanding of interaction in online learning, it can be said that, overall, students had a positive view of what online interaction entailed (see Table 5.5 in Chapter 5). As mentioned earlier, the triangulation of the quantitative and qualitative findings in the table made it evident that the students' understanding of interaction was based on issues about cooperation, communication, information exchange, and resource sharing. It is further concluded from the findings that students should have considered interaction with technology as part of their understanding of online interaction.

7.6.2 What benefits do students derive from interaction in online learning?

The study's findings showed that students benefited much from online interaction (see Table 5.8 in Chapter 5). Some of the benefits were providing opportunities for collaboration and learning from others, requesting clarification on course requirements, getting feedback, and improving interaction through live online meetings utilising Zoom. However, the failure to fully utilise the LMS features and the affordances of their devices were considered hindrances. It is concluded that students reported that they benefitted from interaction in online learning, though there were some reported challenges with technology.

7.6.3 How are students trained and supported for interaction in online learning?

In light of the findings presented in Table 5.11 in the fifth chapter, it is concluded that there needs to be more training and support provided to students regarding the various aspects of the online learning system. Students were trained on both general LMS usage and LMS interactive elements. Students were also not taught or supported using Open Educational Resources (OER), LMS interactive plug-in features like

Jamboard, and social media for learning. The main conclusion from the findings on training and support for online interaction is that these factors needed to be improved, which had a detrimental impact on the nature and quality of online interaction.

7.6.4 What factors promote or hinder interaction in online learning at the rural-based university?

The study also found that some factors, including the availability of opportunities for collaborative learning, other students' willingness to contribute, the availability of appropriate technological tools for online learning, and the appropriate structuring of course content, were confirmed to foster online interaction (see table 5.14 in Chapter 5). The findings suggest that elements considered crucial in affecting online engagement were a favourable prerequisite for online interaction. However, several factors were found to hinder online interaction, and it is determined that if those elements are present, effective online engagement is not possible, and they should be addressed.

7.6.5 What are the implications for online pedagogy at the rural-based university?

It was established that some online teaching methods were used frequently in online learning, while others were less common (see Table 5.17 in Chapter 5). The implications for online pedagogy were that the typical methods typically promoted lower-order kinds of interaction while using uncommon ways could improve the quality of online interaction. It is concluded that there were pedagogical shortcomings, such as failure to engage students in critical thinking or skills application activities that would enhance online interaction quality and attain higher-order learning objectives.

7.6.6 What model or framework can be designed for effective online pedagogy in developing contexts?

Figure 7.1 in section 7.8 provides a framework that could be adopted to enhance online pedagogies in developing contexts. The framework considers factors such as developing an explicit institutional online learning and teaching policy, addressing resource and capacity gaps, entrenching online course/learning design skills in course instructors, student support, and monitoring online learning and teaching for quality assurance.

7.6.7 What are the distance education students' experiences of online interaction at a rural-based university in Eswatini?

When the researcher first started this study, the intention was to answer the main research question, i.e. *what are the distance education students' experiences of online interaction at a rural-based university in Eswatini?* The results of the sub-research questions, which informed the answering of the main research question, make it evident that although students had a favourable perception of what online engagement involved, they still needed to include technology use in their comprehension of the phenomenon. The study also discovered that despite technological issues, students profited from online contact in many ways. Students were generally not given enough instruction or support regarding the various facets of the online learning system. The study also identified several factors that facilitated online interaction while identifying several barriers. It was determined that some online teaching techniques were used frequently in online learning while others were used less frequently. The implications for online pedagogy were that while using rare approaches could raise the quality of online contact, standard methods often promoted lower-order types of interaction.

7.7 LIMITATIONS OF THE STUDY

The study was centred on one rural-based university in Eswatini; hence, there may be a need to carry out a related study that focuses on other universities in some developing countries. The study also looked at students' experiences, and some studies focusing on course instructors' experiences would bring further insights into the issue under investigation.

7.8 RECOMMENDATIONS

The findings showed challenges with students' online interaction in the rural-based university under study, which has implications for online teaching and learning in developing contexts. By addressing significant concerns that address online pedagogies in general and interaction in particular, recommendations are given for rethinking the overall agenda for online teaching and learning in developing contexts. Recommendations are made to ODeL institutions, course facilitators and students.

7.8.1 Recommendations to ODeL Institutions

An ODeL institution should develop an online teaching and learning strategy that addresses policy, resource and skills gaps, course design and pedagogical aspects,

online support, and monitoring of online learning as captured in the framework suggested in Figure 7.1.

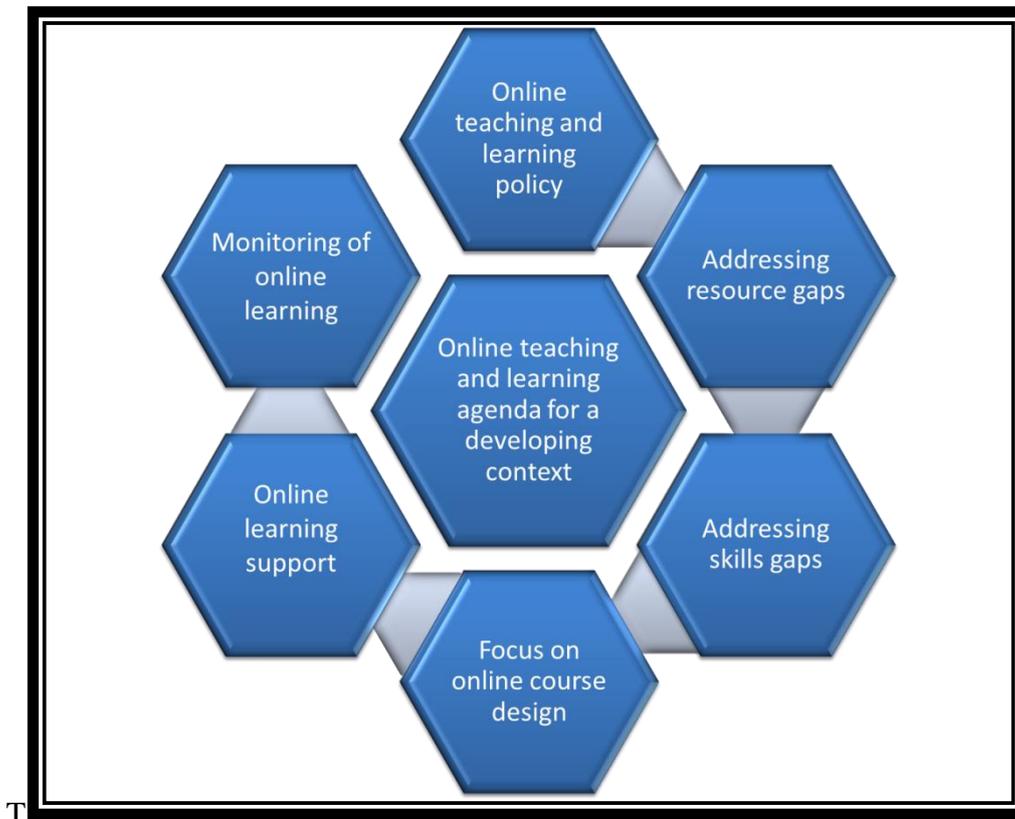


Figure 7.1: Framework for an online teaching and learning agenda in a developing context

The different aspects of the framework, as shown in the above figure, are explained in detail in the following sections.

7.8.1.1 Online teaching and learning policy

Developing an online teaching and learning policy is the first step in addressing online teaching and learning. Such a policy would outline the institution's goals for online education and offer guidelines for implementing them. In such a policy, which then outlines the training and support for course instructors and students and their responsibilities, the principles underpinning online teaching and learning are suitably expressed. An institutional online teaching and learning policy upholds uniformity and encourages the institution to use the best online teaching and learning methods. The goals of the policy will be constantly carried out through online teaching and learning.

7.8.1.2 Addressing resource gaps

The digital divide regarding resource accessibility should be addressed when implementing online teaching and learning in a developing context. Meaningful online teaching and learning is feasible when all students can access the necessary digital technology, including seamless and affordable internet connectivity. The educational institution should be able to profile students and determine who needs assistance with the tools and information needed for internet connectivity. To offer resources for students in need, deliberate resource mobilisation initiatives should be implemented. One strategy to guarantee that digital services are brought closer to the students is to deploy decentralised digital centres. Additionally, partnerships with internet service providers might be established to offer discounted rates to students.

7.8.1.3 Addressing skills gaps

Effective online teaching and learning are achievable when both staff and students' technological and pedagogical capabilities are improved. Therefore, an institutional strategy is required to identify skills deficiencies in course instructors and students, organise the appropriate interventions, and implement them. Students should receive ongoing training in all elements of online learning to participate actively and with greater engagement. The course instructors should be participating in micro-credential programmes, including online course design, online facilitation, online assessment, and development of digital learning materials. These short programmes enhance the online teaching abilities of the course instructors.

7.8.1.4 Focus on online course design

An online teaching and learning agenda in a developing context should foreground the importance of online course design. If the courses offered online are not purposefully developed for online delivery, student engagement and interaction issues may not be realised. There is a need to train course instructors specifically in online course design and assist them in developing courses for online delivery utilising the available online course design models. As Martin et al., (2019, p. 35) noted, online course design is "a context-specific form of instructional design oriented to online learning spaces. Therefore, online course design includes both the features of the online course and the processes and procedures used to create that online course." The roles of the

course instructors and the students in the virtual learning environment will be specified, showing how instruction happens. This approach requires trained and skilled course designers.

7.8.1.5 Online support

To accomplish the required learning outcomes in online teaching and learning, there is an imperative for a well-planned and implemented online support strategy for course instructors and students. Different types of support are required by students when learning online. Students must be aware of what online learning entails and their individual and collective responsibilities to comprehend how to engage with other students, course instructors, information, and technology. There should be support readily available to help students troubleshoot the technical issues they may find when navigating the LMS and using different technologies. Course instructors, on the other hand, need pedagogical and technological assistance. There should be specific guidelines on how and when course instructors and students can get online help.

7.8.1.6 Monitoring of online teaching/learning

Quality assurance mechanisms should be embedded in an online teaching and learning system by monitoring the process. Feedback-generation systems should be embedded in the systems so students may continuously report to course instructors on the learning process. Course instructors should also monitor students' participation and interaction in online learning. Most Learning Management Systems are able to generate reports on individual students' participation, and such reports should provide the basis for monitoring. Therefore, there should be a two-way feedback system. Monitoring student progress can assist in identifying areas where students are failing so they can receive the support they require and keep students on track and moving towards their learning goals. By keeping track of student progress, instructors can get feedback on how a module or course is developing, make necessary revisions, and assess the overall success of the online course. Using this data, judgments can be made regarding how to improve the course moving forward.

7.8.2 Recommendations to ODL Course Facilitators

- Course instructors should design highly student-centred and interactive online courses. Such courses allow students to be active students learning collaboratively with other students.
- Course instructors should provide more collaborative and cooperative learning opportunities in their online courses. Providing such opportunities inculcates students' teamwork spirit, which is an important graduate attribute.
- Student online support is an essential feature of online course delivery, and course instructors should be available to support students as they learn online. E-tutors could be explored to provide sustained support to the students learning online.
- The requirement for course instructors to keep a constant and open line of communication with students stems from the fact that distance education students need to maintain this channel in order to strengthen their connection and involvement in online learning.

7.8.3 Recommendations to ODL students

- Distance education students should be actively involved in online learning and seize every opportunity available to learn collaboratively with other students in the different courses they study.
- Distance education students should upgrade their technical skills to fully explore and utilise the affordances of their digital devices and LMS features for enhanced online learning experiences.

7.9 THEORETICAL IMPLICATIONS

The study contributes to the body of knowledge in online teaching and learning in general and interaction in online learning in particular. The study adds to the existing literature on online teaching and learning as it contributes to debates on the effectiveness of online delivery. The angle of interaction pursued in the study and the resultant findings further confirm the importance of interaction, in the broadest sense, in online learning in enhancing online learning experiences. The hitherto understated concept of interaction with technology is buttressed in the study through the findings

adding to 'voices' in the literature on the significance of online students' interaction with technology in online learning.

The study also contributes to the body of knowledge on the benefits of interaction in online learning by empirically confirming that interaction in online learning is beneficial to students. However, interaction benefits in online learning could be further enhanced by addressing resource and skills gaps to ensure that students utilise the affordances provided by the LMS and the technological devices. Enhanced technological competencies position students to participate fully and meaningfully in online learning.

The study's findings also contribute to enhancing the understanding of the two theories that served as theoretical underpinnings of the study. The linking of the findings to the theoretical underpinnings of the study done in Section 6.7 of the sixth chapter indicated that critical elements of the two theories were confirmed in the study. Connectivism, as a theory, is inherently premised on online interaction, and the findings confirmed how interaction was a prominent feature in students' online learning. The Community of Inquiry Framework, on the other hand, notes the importance of learning communities in online learning, which was also confirmed in the present study's findings.

7.10 PRACTICAL IMPLICATIONS

The present study's findings have significant practical consequences, especially on how online teaching and learning should be planned and implemented in development, as explained in Figure 7.1 in this chapter. Online teaching and learning should be deliberately planned for engaging and maximising interaction. A policy informing the online teaching and learning agenda should be purposefully developed, and resource and skills gaps should be addressed.

An online teaching and learning agenda should be based on the prerequisite element of addressing the technological capacity of students as well as the technological and pedagogical capacities of course facilitators. The practical implication is that implementing online learning in developing contexts should not be based on assumptions, but practical capacity-development programmes should be integrated

into the agenda. Once the students and course facilitators are competent in skills and knowledge associated with online teaching and learning, there will be high-quality online delivery and interactions.

The other practical implication of the findings is the importance of online support as an integral aspect of online teaching and learning. Students and course instructors should be assisted with a sustained online technological support system; there are instances where there will be a need for technological troubleshooting, and this should be available. Lack of technological support negatively affects students' progress. Online support may be extended to academic support for students and pedagogical support for course facilitators. All the forms of support enhance the quality of online learning.

7.11 SUGGESTIONS FOR FURTHER RESEARCH

A more extensive study focusing on different study contexts would add a different dimension to the present study, which focused on one rural-based university in Eswatini. Further studies may be comparative, looking at online learning in different contexts. There may also be a need to carry out related studies that bring to the fore the course facilitators or coordinators' experiences or views on students' online interaction.

7.12 CONCLUSION

The study sought to establish the online interaction experiences of distance education students in a rural-based university in Eswatini. The study had six objectives that focused on students' understanding of interaction in online learning, the benefits derived from online interaction, the way students were trained and supported in online interaction, factors that promoted or hindered online interaction, as well as an assessment of pedagogical implications through the common online teaching techniques, utilised. Two theories, namely connectivism and Community of Inquiry Framework, served as theoretical underpinnings for the study. The mixed methods study followed a concurrent triangulation design in the post-positivist research paradigm. A stratified random sample of 361 students who responded to a well-structured questionnaire was used to collect quantitative data. Due to the sample's

representation of 20% of the entire population, generalisations about the population were possible. 338 of the 361 questionnaires that were distributed were completed and could be analysed. The data were analysed using SPSS software version 29. In order to analyse the data and respond to the sub-research question, descriptive statistics were used. For the study's qualitative aspect, data from four focus groups of ten students each were collected utilising an FGD technique. The purposive sampling technique was used to choose the FGD participants who were considered "information-rich sources" from four programs with the most active courses on Moodle LMS. The theme content analysis technique was used to examine the qualitative data from the FGD. According to the study results, students had a favourable view of online interaction but did not include using technology in their understanding of the concept. The study also discovered that despite technological issues, students profited from online interaction in many ways. Students were generally not given sufficient guidance or support regarding the various facets of the online learning system. The study also identified some elements that encouraged online interaction and several factors that hampered it. It was determined that while some online teaching techniques were more frequently used in online learning, others were less so. The implications for online pedagogy were that while using rare approaches could raise the quality of online contact, using standard methods often promoted lower-order forms of interaction.

REFERENCES

- Abik, M., Ajhoun, R., & Ensias, L. (2012). Impact of technological advancement on pedagogy. *Turkish Online Journal of Distance Education*, 13(1), 224–237. <https://dergipark.org.tr/en/pub/tojde/issue/16899/176133>
- Aboagye, E., Yawson, J. A., & Appiah, K. N. (2020). COVID-19 and E-Learning: the challenges of students in tertiary institutions. *Social Education Research*, 109–115. <https://doi.org/10.37256/ser.122020422>
- Adams, N. E. (2015). Bloom's taxonomy of cognitive learning objectives. *Journal of the Medical Library Association: JMLA*, 103(3), 152–153. <https://doi.org/10.3163/1536-5050.103.3.010>
- Adedoyin, O. B., & Soykan, E. (2020). Covid-19 pandemic and online learning: the challenges and opportunities. *Interactive Learning Environments*, 31(2), 863–875. <https://doi.org/10.1080/10494820.2020.1813180>
- Aderibigbe, S. A. (2021). Can online discussions facilitate deep learning for students in general education? *Heliyon*, 7(3), 1–7. <https://doi.org/10.1016/j.heliyon.2021.e06414>
- Adetimirin, A. (2015). An empirical study of online discussion forums by Library and Information Science postgraduate students using Technology Acceptance Model 3. *Journal of Information Technology Education: Research*, 14, 257–269. <https://doi.org/10.28945/2269>
- Adhiambo, A. C. (2021). From the Classroom into Virtual Learning Environments: Essential Knowledge, Competences, Skills and Pedagogical Strategies for the 21st Century Teacher Education in Kenya. IntechOpen. doi: 10.5772/intechopen.96950
- Afify, M. K. (2019). The influence of group size in the asynchronous online discussions on the development of critical thinking skills, and on improving students' performance in online discussion forum. *International Journal of Emerging Technologies in Learning (IJET)*, 14(05), 132–152. <https://doi.org/10.3991/ijet.v14i05.9351>
- African Union Commission. (2015). *African Union Agenda 2063: The Africa We Want*. Addis Ababa: African Union Commission.
- Ajayi, P. O., & Ajayi, L. F. (2020). Use of online collaborative learning strategy in enhancing postgraduates learning outcomes in science education. *Educational Research and Reviews*, 15(8), 504–510. <https://doi.org/10.5897/err2020.4023>
- Akcaoglu, M., & Eunbae, L. (2016). Increasing social presence in online learning through small group discussions. *The International Review of Research in Open and Distributed Learning*, 17(3), 1–17. <https://doi.org/10.19173/irrodl.v17i3.2293>
- Akhter, F. (2017). Virtual learning environment: How well-designed multimedia lowers the students' cognitive load. *Journal of International Business Research*, 16(1), 1-6. <https://faculty.ksu.edu.sa/sites/default/files/virtual-learning-environment-how-well-designed-multimedia-lowers-the-learners-cognitive-load.pdf>
- Al Hashimi, Z. I. (2020). Big Blue Button for e-Learning: the effect of privacy and support quality. *International Journal of Engineering Applied Sciences and Technology*, 5(3), 59–65. <https://doi.org/10.33564/ijeast.2020.v05i03.010>
- Al-Hariri, M. T., & Al-Hattami, A. A. (2017). Impact of students' use of technology on their learning achievements in physiology courses at the University of Dammam. *Journal of Taibah University Medical Sciences*, 12(1), 82–85. <https://doi.org/10.1016/j.jtumed.2016.07.004>

- Alawamleh, M. (2020). COVID-19 and higher education economics. *Journal of Economics and Economic Education Research*, 21(2), 1–2.
- Alawamleh, M., Al-Twait, L. M., & Al-Saht, G. R. (2020). The effect of online learning on communication between instructors and students during Covid-19 pandemic. *Asian Education and Development Studies*, 11(2), 380–400. <https://doi.org/10.1108/aeds-06-2020-0131>
- Al-Fraihat, D., Joy, M., Masa'deh, R., & Sinclair, J. (2020). Evaluating e-learning systems success: An empirical study. *Computers in Human Behavior*, 102, 67–86. <https://doi.org/10.1016/j.chb.2019.08.004>
- Alhih, M., Ossiannilsson, E., & Berigel, M. (2017). Levels of interaction provided by online distance education models. *EURASIA Journal of Mathematics, Science and Technology Education*, 13(6), 2733–2748. <https://doi.org/10.12973/eurasia.2017.01250a>
- Alkhasawneh, S., & Alqahtani, M. A. M. (2019). Fostering students' self-regulated learning through using a learning management system to enhance academic outcomes at the University of Bisha. *TEM Journal*, 8(2), 662-669. <https://doi.org/10.18421/TEM82-47>
- Allred, O. S. E. (2016). Effects of Student-to-Student Interactions on Social Presence, Achievement and Satisfaction. Unpublished Doctor of Philosophy (PhD), Dissertation, STEM Education & Professional Studies, Old Dominion University. <https://doi.org/10.25777/6ya8-zk73>
- Almaleki, D. A., Alhajaji, R. A., & Alharbi, M. A. (2021). Measuring students' interaction in distance learning through the electronic platform and its impact on their motivation to learn during Covid-19 crisis. *IJCSNS International Journal of Computer Science and Network Security*, 21(5), 98-112. <https://doi.org/10.22937/IJCSNS.2021.21.5.16>
- Almahasees, Z., Mohsen, K., & Amin, M. O. (2021). Faculty's and students' perceptions of online learning during COVID-19. *Frontiers in Education*, 6. <https://doi.org/10.3389/educ.2021.638470>
- Alotebi, H., Alharbi, O., & Masmali, A. (2018). Effective leadership in virtual learning environments. *International Journal of Information and Education Technology*, 8(2), 156–160. <https://doi.org/10.18178/ijiet.2018.8.2.1026>
- Alqurashi, E. (2018). Predicting student satisfaction and perceived learning within online learning environments. *Distance Education*, 40(1), 133–148. <https://doi.org/10.1080/01587919.2018.1553562>
- Al-Saadi, H. (2014). Demystifying ontology and epistemology in research methods. https://www.researchgate.net/publication/260244813_Demystifying_Ontology_and_Epistemology_in_Research_Methods/citation/download
- Aluko, F. R. (2021). Evaluating student support provision in a hybrid teacher education programme using Tait's framework of practice. *Open Praxis*, 13(1), 21–35. <https://doi.org/10.5944/openpraxis.13.1.1171>
- Alyahyan, E., & Dustegor, D. (2020). Predicting academic success in higher education: literature review and best practices. *International Journal of Educational Technology in Higher Education*, 17(1), 1–21. <https://doi.org/10.1186/s41239-020-0177-7>
- Alzahrani, M. G. (2017). The effect of using online discussion forums on students' learning. *The Turkish Online Journal of Educational Technology*, 16(1), 164–176. <http://www.tojet.net/articles/v16i1/16115.pdf>

- Ames, H., Glenton, C., & Lewin, S. (2019). Purposive sampling in a qualitative evidence synthesis: a worked example from a synthesis on parental perceptions of vaccination communication. *BMC Medical Research Methodology*, 19(26), 1-9. doi: 10.1186/s12874-019-0665-4
- Ames, K. (2016). Distance education and 'discovery learning' in first-year Journalism: a case in subject improvement. *Asia Pacific Media Educator*, 26(2), 214–225. <https://doi.org/10.1177/1326365x16669196>
- Amrullah, M. P. D., & Zahratun, N. (2022). Student-student interaction in online learning during the COVID-19 pandemic. *Journal of Applied Studies in Language*, 6(1), 37–45. <https://doi.org/10.31940/jasl.v6i1.446>
- Ananga, P. (2020). Factors that influence instructors' integration of social media platforms into higher education pedagogy in Ghana. *Journal of Educational Issues*, 6(2), 118–138. <https://doi.org/10.5296/jei.v6i2.17367>
- Anderson, T. (2011). Towards a theory of online learning. In T. Anderson (Ed.). *The theory and practice of online learning* (2nd ed., pp. 45 - 74). Edmonton, AB: Athabasca University Press.
- Anderson, T. (2016). Theories for learning with emerging technologies. In G. Veletsianos (Ed.), *Emergence and innovation in digital learning: Foundations and applications* (35-64). Edmonton: Athabasca University Press.
- Anderson, T., & Dron, J. (2011). Three generations of distance education pedagogy. *The International Review of Research in Open and Distributed Learning*, 12(3), 80–97. <https://doi.org/10.19173/irrodl.v12i3.890>
- Anderson, T., Rourke, L., Garrison, R., & Archer, W. (2019). Assessing teaching presence in a computer conferencing context. *Online Learning*, 5(2). 1–17. <https://doi.org/10.24059/olj.v5i2.1875>
- Andrews, T. (2016). Ontological issues in qualitative research in nursing. *Texto & Contexto - Enfermagem*, 25(3), 1–2. <https://doi.org/10.1590/0104-0707201600453editorial>
- Andrews-Todd, J., & Rapp, D. (2015). Benefits, costs, and challenges of collaboration for learning and memory. *Translational Issues in Psychological Science*. 1(1), 182–191. 10.1037/tps0000025.
- Anfara, V. A., & Mertz, N. T. (2015). *Theoretical frameworks in qualitative research*. (2nd ed). Thousand Oaks, CA: Sage.
- Ankrah, E. (2014). The impact of information systems strategy on bank performance in Ghana. (Unpublished Doctoral Thesis). Department of Information Studies, University of Ghana.
- Anney, V. N. (2014). Ensuring the quality of the findings of qualitative research: Looking at trustworthiness criteria. *Journal of Emerging Trends in Educational Research and Policy Studies* 5(2), 272–281.
- Ansari, J. A. N., & Khan, N. A. (2020). Exploring the role of social media in collaborative learning the new domain of learning. *Smart Learning Environments*, 7(1), 1–16. <https://doi.org/10.1186/s40561-020-00118-7>
- Aoki, K. (2012). Generations of distance education: technologies, pedagogies, and organizations. *Procedia - Social and Behavioral Sciences*, 55, 1183–1187. <https://doi.org/10.1016/j.sbspro.2012.09.613>
- Archila, P. A., Restrepo, S., Truscott de Mejía, A. M., Rueda-Esteban, R., & Bloch, N. I. (2022). Fostering instructor-student argumentative interaction in online lecturing to large groups: a study amidst the Covid-19 pandemic. *Revista Eureka Sobre Enseñanza Y Divulgación De Las Ciencias*, 19(1), 1–17. https://doi.org/10.25267/rev_eureka_ensen_divulg_cienc.2022.v19.i1.1101

- Arinto, P. B. (2016). Issues and challenges in Open and Distance e-Learning: Perspectives from the Philippines. *The International Review of Research in Open and Distributed Learning*, 17(2), 162–80. <https://doi.org/10.19173/irrodl.v17i2.1913>
- Arulkadacham, L., McKenzie, S., Aziz, Z., Chung, J., Dyer, K., Holt, C., Garivaldis, F., & Mundy, M. (2021). General and unique predictors of student success in online courses: A systematic review and focus group. *Journal of University Teaching & Learning Practice*, 18(8), 1 - 22 <https://doi.org/10.53761/1.18.8.7>
- Ashour, M. L. (2018). Triangulation as a powerful methodological research technique in technology-based services. *Business & Management Studies: An International Journal*, 6(1), 193–208. <https://doi.org/10.15295/bmij.v6i1.209>
- Asio, J. M. R., Gadia, E., Abarintos, E., Paguio, D., & Balce, M. (2021). Internet connection and learning device availability of college students: basis for institutionalizing flexible learning in the new normal. *Studies in Humanities and Education*, 2(1), 56–69. <https://doi.org/10.48185/she.v2i1.224>
- Aslan, A. (2021). Problem-based learning in live online classes: Learning achievement, problem-solving skill, communication skill, and interaction. *Computers & Education*, 171, 1–15. <https://doi.org/10.1016/j.compedu.2021.104237>
- Athens, W. (2018). Perceptions of the persistent: Engagement and learning community in underrepresented populations. *Online Learning*, 22(2), 27–58. <https://doi.org/10.24059/olj.v22i2.1368>
- Atkinson, D., & Lim, S. L. (2013). Improving assessment processes in higher education: student and teacher perceptions of the effectiveness of a rubric embedded in a LMS. *Australasian Journal of Educational Technology*, 29(5), 651–666. <https://doi.org/10.14742/ajet.526>
- Babbie, E. R. (2012). *The practice of social research* (12thed.). Belmont, California: Wadsworth Cengage Learning.
- Babbie, E. R. (2014). *The basics of social research* (6th eds.). Belmont, CA: Wadsworth, Cengage Learning.
- Baber, H. (2020). Determinants of students' perceived learning outcome and satisfaction in online learning during the pandemic of COVID-19. *Journal of Education and E-Learning Research*, 7(3), 285–292.
- Baber, H. (2021). Social interaction and effectiveness of the online learning – A moderating role of maintaining social distance during the COVID-19 pandemic. *Asian Education and Development Studies*, 11(1), 159–171. <https://doi.org/10.1108/AEDS-09-2020-0209>
- Baishya, D., & Maheshwari, S. (2019). WhatsApp groups in academic context: exploring the academic uses of WhatsApp groups among the students. *Contemporary Educational Technology*, 11(1), 31–46. <https://doi.org/10.30935/cet.641765>
- Baker, C., & Taylor, S. L. (2010). The importance of teaching presence in an online course. *Online Classroom*, 5–8.
- Banihashem, S. K., & Aliabadi, K. (2017). Connectivism: implications for distance education. *The Interdisciplinary Journal of Virtual Learning in Medical Sciences*, 8(3), 1–7. <https://doi.org/10.5812/IJVLMS.10030>
- Banks, S., Armstrong, A., Carter, K., Graham, H., Hayward, P., Henry, A., Holland, T., Holmes, C., Lee, A., McNulty, A., Moore, N., Nayling, N., Stokoe, A., & Strachan, A. (2013). Everyday ethics in community-based participatory

- research. *Contemporary Social Science*, 8(3), 263–277. <https://doi.org/10.1080/21582041.2013.769618>
- Banna, J.G., Lin, M. F., Stewart, M., & Fialkowski, M. K. (2015). Interaction matters: Strategies to promote engaged learning in an online introductory nutrition course. *Journal of Online Learning and Teaching*, 11(2), 249–261.
- Bao, W. (2020). COVID-19 and online teaching in higher education: A case study of Peking University. *Human Behavior and Emerging Technologies*, 2(2), 113–115. <https://doi.org/10.1002/hbe2.191>
- Baral, U. N. (2017). 'Research Data' in social science methods. *Journal of Political Science*, 17, 82–104. <https://doi.org/10.3126/jps.v17i0.20515>
- Barbera, J., Naibert, N., Komperda, R., & Pentecost, T. C. (2020). Clarity on Cronbach's Alpha use. *Journal of Chemical Education*, 98(2), 257–258. <http://doi.org/10.1021/acs.jchemed.0c00183>
- Barrot, J. S., Llenares, I. I., & Del Rosario, L. S. (2021). Students' online learning challenges during the pandemic and how they cope with them: The case of the Philippines. *Education and Information Technologies*, 26(1), 7321–7338. <https://doi.org/10.1007/s10639-021-10589-x>
- Basilaia, G., & Kvavadze, D. (2020). Transition to online education in schools during a SARS-CoV-2 coronavirus (COVID-19) pandemic in Georgia. *Pedagogical Research*, 5(4), 1-9. <https://doi.org/10.29333/pr/7937>
- Basilaia, G., Dgebuadze, M., Kantaria, M., & Chokhonelidze, G. (2020). Replacing the classic learning form at universities as an immediate response to the COVID-19 virus infection in Georgia. *International Journal for Research in Applied Science and Engineering Technology*, 8(3), 101-108. <https://doi.org/10.22214/ijraset.2020.3021>
- Bates, A. W. (2019). *Teaching in a Digital Age – Second Edition*. Vancouver, B.C.: Tony Bates Associates Ltd. Retrieved from: <https://pressbooks.bccampus.ca/teachinginadigitalagev2>. Date of access: 2 August 2020.
- Bates, B. (2019). *Learning Theories Simplified*. London: SAGE
- Bates, A. W. (2020). Advice to those about to teach online because of the coronavirus. <https://www.tonybates.ca/2020/03/09/advice-to-those-about-to-teach-online-because-of-the-coronavirus>. Date of access: 2 August, 2020.
- Bawa, P. (2016). Retention in online courses: exploring issues and solutions—a literature review. *SAGE Open*, 6(1), 1–11. <https://doi.org/10.1177/2158244015621777>
- Bazeley, P. (2018). *Integrating Analyses in Mixed Methods Research*. Thousand Oaks, CA: SAGE.
- Beebe, R., Vonderwell, S., & Boboc, M. (2010). Emerging patterns in transferring assessment practices from f2f to online environments. *Electronic Journal of e-Learning*, 8(1), 1-12.
- Bell, F. (2011). Connectivism: Its place in theory-informed research and innovation in technology-enabled learning. *International Review of Research in Open and Distance Learning*, 12(3), 98-118. <https://doi.org/10.19173/irrodl.v12i3.902>
- Bergamin, P. B., Werlen, E., & Bochud, Y. E. (2019). Scaffolding collaborative learning in pairs within a technology-enhanced learning environment. *International Journal of Information and Education Technology*, 7(1), 40-45. <https://doi.org/10.4018/978-1-5225-9316-4.ch001>

- Bernstein, D. A. (2018). Does active learning work? A good question, but not the right one. *Scholarship of Teaching and Learning in Psychology*, 4(4), 290-307. <https://doi.org/10.1037/stl0000124>
- Berry, S. (2019). Teaching to connect: Community-building strategies for the virtual classroom. *Online Learning*, 23(1), 164-183. <https://doi.org/10.24059/olj.v23i1.1425>
- Biddle, C., & Schafft, K. A. (2015). Axiology and anomaly in the practice of mixed methods work: Pragmatism, valuation, and the transformative paradigm. *Journal of Mixed Methods Research*, 9(4), 320-334. <https://doi.org/10.1177/1558689814533157>
- Biesta, G., Allan, J., & Edwards, R. (2011). The theory question in research capacity building in education: towards an agenda for research and practice. *British of Educational Studies*, 59(3), 225-239. <https://doi.org/10.1080/00071005.2011.599793>
- Biggs, J. (2014). Constructive alignment in university teaching. *HERDSA Review of Higher Education*, 1, 5-22.
- Biriyai, H., & Emmah, V. T. (2014). Online discussion forum: a tool for effective student-teacher interaction. *International Journal of Applied Science-Research and Review*, 1(3), 111-116. <https://doi.org/10.2139/ssrn.2525047>
- Blau, I., Weiser, O., & Eshet-Alkalai, Y. (2017). How do medium naturalness and personality traits shape academic achievement and perceived learning? An experimental study of face-to-face and synchronous e-learning. *Research in Learning Technology*. 25. doi: 10.25304/rlt.v25.1974
- Boddy, C. (2005). "A rose by any other name may smell as sweet but —group discussion is not another name for a —focus group nor should it be." *Qualitative Market Research: An International Journal*, 8(3), 248-255. <https://doi.org/10.1108/13522750510603325>
- Bollinger, D. U., & Erichsen, E. A. (2013). Student satisfaction with blended and online courses based on personality type. *Canadian Journal of Learning & Technology*, 39(1), 1-23.
- Bork, R. H., & Rucks-Ahidiana, Z. (2013). Role ambiguity in online courses: An analysis of student and instructor expectations. (CCRC Working Paper No. 64) New York, NY: Columbia University, Teachers College, Community College Research Center. Retrieved from: <http://ccrc.tc.columbia.edu/mekia/k2/attachments/role-ambiguity-in-online-courses.pdf>. Accessed 20 May 2021.
- Borthwick, A., & Hansen, R. (2017). Digital literacy in teacher education. Are teacher educators competent? *Journal of Digital Learning in Teacher Education*, 33(2), 46-48. <https://doi.org/10.1080/21532974.2017.1291249>
- Boton, E. C., & Gregory, S. (2015). Minimizing attrition in online degree courses. *Journal of Educators Online*, 12(1), 62 - 90. <https://doi.org/10.9743/JEO.2015.1.6>
- Boyraz, S., & Ocak, G. (2021). Connectivism: A Literature Review for the New Pathway of Pandemic Driven Education. *International Journal of Innovative Science and Research Technology*, 6(3), 1122 -1129
- Boyer, S. L., Edmonson, D. R., Artis, A. B., & Fleming, D. (2014). Self-directed learning: A tool for lifelong learning. *Journal of Marketing Education*, 36(1), 20-32. <https://doi.org/10.1177/0273475313494010>

- Bozkurt, A., & Sharma, R. C. (2020). Emergency remote teaching in a time of global crisis due to CoronaVirus pandemic. *Asian Journal of Distance Education*, 15(1), 1–6.
- Bradley, V. M. (2021). Learning Management System (LMS) use with online instruction. *International Journal of Technology in Education (IJTE)*, 4(1), 68-92. <https://doi.org/10.46328/ijte.36>
- Brame, C. J. (2016). Effective educational videos: principles and guidelines for maximizing student learning from video content. *CBE Life Sciences Education*, 15(6), 1-6. <https://doi.org/10.1187/cbe.16-03-0125>
- Breiburd, S. A., Klebs, D. N., & Vázquez, E. (2017). Aportes para el manejo del aula: 10 pautas básicas para el profesor novato de escuela secundaria. *Diálogos Pedagógicos*, 15(30), 93-104. [http://dx.doi.org/10.22529/dp.2017.15\(30\)05](http://dx.doi.org/10.22529/dp.2017.15(30)05)
- Brodie, C. (2018). Providing a digital education is the key to progress in this era of innovation. Retrieved from: <https://digitalempowers.com/providing-digital-education-keyprogress-era-innovation>. Date of access: 25 October, 2021.
- Bryman, A. (2006). Paradigm Peace and the Implications for Quality. *International Journal of Social Research Methodology*, 9(2), 111–126. <https://doi.org/10.1080/13645570600595280>
- Bryman, A. (2008). *Social research methods*. Oxford: Oxford University Press.
- Bryman, A. (2012). *Social research methods* (4th ed.). Oxford: Oxford University Press.
- Bryman, A., & Bell, E. (2011). *Business Research Methods*, Oxford: Oxford University Press.
- Budash, D., & Shaw, M. (2017). Persistence in an online master’s degree program: Perceptions of students and faculty. *Online Journal of Distance Learning Administration*, 20(3), 1-13. Retrieved from: https://www.westga.edu/~distance/ojdla/fall2013/budash_shaw203.html. Date of access: 2 August, 2021.
- Budiman, E. (2020). Mobile data usage on online learning during COVID-19 pandemic in higher education. *International Journal of Interactive Mobile Technologies*, 14(19), 4-16, 2020. DOI: 10.3991/ijim.v14i19.17499
- Burgess, A., van Diggele, C., Roberts, C., & Mellis, C. (2020). Team-based learning: design, facilitation and participation. *BMC Medical Education*, 20(461), 1-7. <https://doi.org/10.1186/s12909-020-02287-y>
- Burke, J. A., & Onwuegbuzie, J. A., & Turner, L. A. (2007). Toward a definition of mixed methods research. *Journal of Mixed Methods Research*, 1(2), 112-133. <https://doi.org/10.1177/1558689806298224>
- Cafferty, P. W. (2021). Adaptation and facilitation of small group activities in an online introductory biology class *CourseSource*. 8, 1-7. <https://doi.org/10.24918/cs.2021.9>
- Cameron, R. (2011). Mixed Methods Research: The five Ps Framework. *Electronic Journal of Business Research Methods*, 9(2), 96-108.
- Campos, N., Nogal, M., Caliz, C., & Juan, A. A. (2020). Simulation-based education involving online and on-campus models in different European universities. *International Journal of Educational Technology in Higher Education*, 17(8), 1 - 15. <https://doi.org/10.1186/s41239-020-0181-y>.
- Capdeferro, N., & Romero, M. (2012). Are online students frustrated with collaborative learning experiences? *The International Review of Research in*

- Open and Distributed Learning*, 13(2), 26-44.
<https://doi.org/10.19173/irrodl.v13i2.1127>
- Carless, D. (2015). *Excellence in university assessment: Learning from award-winning practice*. London: Routledge.
- Castro, F. G., Kellison, J. G., Boyd, S. J., & Kopak, A. (2010). A Methodology for conducting integrative mixed methods research and data analyses. *Journal of mixed methods research*, 4(4), 342–360.
<https://doi.org/10.1177/1558689810382916>
- Cavalcanti, A. P., Barbosa, A., Carvalho, R., Freitas, F., Tsai, Y. S., Gasevic, D., & Mello, R. F. (2021). Automatic feedback in online learning environments: A systematic literature review. *Computers and Education: Artificial Intelligence*, 2, 1–17. <https://doi.org/10.1016/j.caeai.2021.100027>
- Cegarra-Sanchez, J., Bolisani, E., Cegarra-Navarro, J. G., & Martinez Caro, E. (2018). Online learning communities and their effects on relational capital. *VINE Journal of Information and Knowledge Management Systems*, 48(4), 491-503. <https://doi.org/10.1108/VJKMS-01-2018-0004>
- Chang, B. (2019). Reflection in learning. *Online Learning*, 23(1), 95-110.
<https://doi.org/10.24059/olj.v23i1.1447>
- Chang, S., & Kuo, A. C. (2021). Indulging interactivity: a learning management system as a facilitative boundary object. *SN Social Sciences*, 1(62), 1-15.
<https://doi.org/10.1007/s43545-021-00069-x>
- Chen, C., Landa, S., Padilla, A., & Yur-Austin, J. (2021). Students' experience and needs in online environments: adopting agility in teaching. *Journal of Research in Innovative Teaching & Learning*, 14(1), 18-31. <https://doi.org/10.1108/JRIT-11-2020-0073>
- Chen, C. H., & Yang, Y. C. (2019). Revisiting the effects of a project-based learning on students' academic achievement: A meta-analysis investigating moderators. *Educational Research Review*, 26(1), 71 – 81.
<https://doi.org/10.1016/j.edurev.2018.11.001>.
- Chen, J., Wang, M., Kirschner, P. A., & Tsai, C. C. (2018). The role of collaboration, computer use, learning environments, and supporting strategies in CSCL: A meta-analysis. *Review of Educational Research*, 88(6), 799-843.
<https://doi.org/10.3102/0034654318791584>
- Chen, M. M. (2018). Students' perceptions of the educational usage of a Facebook group. *Journal of Teaching in Travel & Tourism*, 18(4), 332-348.
<https://doi.org/10.1080/15313220.2018.1434448>
- Cheung, C., & Cable, J. (2017). Eight principles of effective online teaching: A decade-long lessons learned in project management education. *PM World Journal: A global resource for sharing knowledge in Program and Project Management*, 6(7), 1-16.
- Chiong, R., & Jovanonich, J. (2012). Collaborative learning in online study groups: An evolutionary game theory perspective. *Journal of Information Technology Education: Research*, 11, 81-101. <https://doi.org/10.28945/1574>
- Christoforidou, A., & Georgiadou, E. (2022). Awareness and use of OER by higher education students and educators within the graphic arts discipline in Greece. *Education Sciences*, 12(16), 1-17. <https://doi.org/10.3390/educsci12010016>
- Chung, G. K. W. K., Shel, T., & Kaiser, W. J. (2006). An exploratory study of a novel online formative assessment and instructional tool to promote students' circuit problem-solving. *Journal of Technology, Learning, and Assessment*, 5(6), 1-27.

- Churches, A. (2009). Taxonomia de Bloom para la era digital. *Eduteka. Recuperado*, 11, 1-13.
- Clark, D. B., Tanner-Smith, E. E., & Killingsworth, S. S. (2016). Digital games, design, and learning: A systematic review and meta-analysis. *Review of Educational Research*, 86(1), 79-122. <https://doi.org/10.3102/0034654315582065>
- Cleary, Y. (2021). Fostering communities of inquiry and connectivism in online technical communication programs and courses. *Journal of Technical Writing and Communication*, 51(1), 11-30. <https://doi.org/10.1177/0047281620977138>
- Clements, K., & Pawlowski, J. (2012). User-oriented quality for OER: Understanding teachers' views on re-use, quality, and trust. *Journal of Computer Assisted Learning*, 28(1), 4-14. <http://dx.doi.org/10.1111/j.1365-2729.2011.00450.x>
- Cloete, A. (2015). Educational technologies: Exploring the ambiguous effect on the training of ministers. In M. Naidoo (ed.), *Contesting issues in training ministers in South Africa*, (pp. 141-154). Stellenbosch: Sun Press.
- Coffelt, T. A. (2017). Confidentiality and anonymity of participants. *The SAGE encyclopaedia of communication research methods*, 227-230. <https://doi.org/10.4135/9781483381411.n86>
- Cohen, L., Manion, L., & Morrison, K. (2018). *Research Methods in Education* 8th Edition. London: Routledge.
- Collard, S., & van Teijlingen, E. (2016). Internet-based focus groups: New approaches to an 'old' research method. *Health Prospect*, 15(3), 4-7. <https://doi.org/10.3126/hprospect.v15i3.16327>
- Collins, J. W., & O'Brien, N. P. (2003). *The greenwood dictionary of education*. Westport, Connecticut. London: Greenwood Press.
- Collins, C. S., & Stockton, C. M. (2018). The central role of theory in qualitative research. *International Journal of Qualitative Methods*, 17(1), 1-10.
- Conrad, R., & Donaldson, J. A. (2012). *Continuing to engage the online student*. San Francisco, CA: Jossey-Bass.
- Costley, J. (2021). How role-taking in a group-work setting affects the relationship between the amount of collaboration and germane cognitive load. *International Journal of Educational Technology in Higher Education*, 18(24), 1 - 13. <https://doi.org/10.1186/s41239-021-00259-w>
- Costley, J., & Lange, C. (2016). The effects of instructor control of online learning environments on satisfaction and perceived learning. *The Electronic Journal of e-Learning*, 14(3), 169-180.
- Creswell, J. W. (2014). *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches*. Thousand Oaks: Sage.
- Creswell, J. W., & Creswell, J. D. (2018). *Research design: qualitative, quantitative, and mixed methods approaches* (Fifth). New York: Sage Publications.
- Creswell, J. W., & Plano Clark, V. L. (2017). *Designing and conducting mixed methods research*. Thousand Oaks, CA: Sage.
- Creswell, J. W., Fetters, M. D., & Ivankova, N. V. (2004). Designing a mixed methods study in primary care. *Annals of Family Medicine*, 2(1), 1-6. <https://doi.org/10.1370/afm.104>
- Croft, N., Dalton, A., & Grant, M. (2010). Overcoming isolation in distance learning: building a learning community through time and space. *Journal for Education in the Built Environment*, 5(1), 27-64. <https://doi.org/10.11120/jebe.2010.05010027>

- Crotty, M. (2003). *The Foundations of Social Research: Meaning and Perspectives in the Research Process* London: Sage Publications, 3rd Edition
- Cullinan, J., Flannery, D., Harold, J., Lyons, S., & Palcic, D. (2021). The disconnected: COVID-19 and disparities in access to quality broadband for higher Open Access education students. *International Journal of Technology in Higher Education*, 18(26), 1-21. <https://doi.org/10.1186/s41239-021-00262-1>
- Cummings-Clay, D. (2020). Impact of OER in Teacher Education, *Open Praxis*, 12(4), 541 - 554. DOI: <https://doi.org/10.5944/openpraxis.12.4.1112>
- D'Alba, O. A. (2014). A case study of student-instructor connectedness in an asynchronous modular online environment (Unpublished doctoral dissertation) Atlanta: Georgia State University.
- Danesh, A., Bailey, A., & Whisenand, T. (2015). Technology and instructor-interface interaction in distance education. *International Journal of Business and Social Science*, 6(2), 39-47.
- Daniels, N., Gillen, P., Casson, K., & Wilson, I. (2019). STEER: factors to consider when designing online focus groups using audio-visual technology in health research. *International Journal of Qualitative Methods*. 18, 1 – 11. <https://doi.org/10.1177/1609406919885786>
- Davis, S. (2021). Online forum participation in an online master of computer science program. In G. Marks (Ed.), *Proceedings of International Journal on E-Learning 2021* (pp. 411-432). Waynesville, NC USA: Association for the Advancement of Computing in Education (AACE). <https://www.learntechlib.org/primary/p/181092/>.
- Dawadi, S., Shrestha, S., & Giri, R. A. (2021). Mixed-methods research: A discussion on its types, challenges, and criticisms. *Journal of Practical Studies in Education*, 2(2), 25-36. <https://doi.org/10.46809/jpse.v2i2.20>
- Dawson, P., Henderson, M., Mahoney, P., Phillips, M., Ryan, T., Boud, D., & Molloy, E. (2019). What makes for effective feedback: Staff and student perspectives. *Assessment & Evaluation in Higher Education*, 44(1), 25–36. <https://doi.org/10.1080/02602938.2018.1467877>
- Demuyakor, J. (2020). Coronavirus (COVID-19) and online learning in higher institutions of education: a survey of the perceptions of Ghanaian international students in China. *Online Journal of Communication and Media Technologies*, 10(3), 1 - 9. doi: 10.29333/ojcm/8286
- De Oliveira, P. C., Cunha, C. D., & Nakayama, M. K. (2016). Learning Management Systems (LMS) and e-learning management: An integrative review and research agenda. *Journal of Information Systems and Technology Management*, 13(2), 157-180. <https://doi.org/10.4301/S1807-1775201600020001>
- De Wever, B., & Strijbos, J. W. (2021). Roles for structuring groups for collaboration. In Cress, U., Rosé, C., Wise, A., Oshima, J., (Eds) *International Handbook of Computer-Supported Collaborative Learning; Computer-Supported Collaborative Learning Series* (pp. 315–331). Cham, Germany; Springer.
- Denzin, D. (2010). Moments, mixed methods, and paradigm dialogs. *Qualitative Inquiry*, 16(6), 419-427. <https://doi.org/10.1177/1077800410364608>
- D'Eon, M. F. (2020). Being a post-positivist is exhausting: The daunting commitment to an uncertain truth. *Canadian Medical Education Journal*, 11(5), e1–e4. <https://doi.org/10.36834/cmej.71151>
- Deterding, S., Sicart, M., Nacke, L., O'Hara, K., & Dixon, D. (2011). Gamification: Using game-design elements in non-gaming contexts. In: CHI'11 extended

- abstracts on human factors in computing systems (p 2425–2428). New York: ACM. <https://doi.org/10.1145/1979742.1979575>
- Devetak, I., Glažar, S. A., & Vogrinc, J. (2010). The role of qualitative research in science education. *Eurasia Journal of Mathematics, Science & Technology Education*, 6(1), 77-84. <https://doi.org/10.12973/ejmste/75229>
- DeWitt, D., Alias, N., Siraj, S., & Zakaria, A. R. (2014). Interactions in online forums: a case study among first-year undergraduate students. *Frontiers in Education*, 2(1), 6-13.
- Dhawan, S. (2020). Online Learning: A Panacea in the Time of COVID-19 Crisis. *Journal of Educational Technology Systems*, 49(1), 5 - 22.
- Dlamini, P., Maphosa, C., Rugube, T., & Mthethwa-Kunene, K. E. (2022). Evaluating the online learning experiences of participants in an online education course. *Journal of Education and Practice*, 13(20), 24-32.
- Domínguez-Figaredo, D., Gil-Jaurena, I., & Morentin-Encina, J. (2022). The impact of rapid adoption of online assessment on students' performance and perceptions: evidence from a distance learning university. *The Electronic Journal of e-Learning*, 20(3), 224-241.
- Du, Z., Wang, F., Wang, S., & Xiao, X. (2022) Enhancing student participation in online discussion forums in massive open online courses: the role of mandatory participation. *Frontiers in Psychology*, 13(1), 1 - 12. doi: 10.3389/fpsyg.2022.819640
- Durgungoz, A., & Durgungoz, C. (2022). “We are much closer here”: exploring the use of WhatsApp as a learning environment in a secondary school mathematics class. *Learning Environments Research*, 25(1), 423 - 444 <https://doi.org/10.1007/s10984-021-09371-0>
- Du Plessis, M., Van Vuuren, C. D. J., Simons, A., Frantz, J., Roman, N., & Andipatin, M. (2022). South African Higher Education institutions at the beginning of the Covid-19 pandemic: sense-making and lessons learnt. *Frontiers in Education*, 6(1), 1–17. <https://doi.org/10.3389/feduc.2021.740016>
- Dube, B., & Shawe, T. G. J. (2022). Data Analysis and Interpretation Procedures. In E. Adu & C. Okeke *Fundamentals of Research in Humanities, Social Sciences and Science Education*. (p 152-166) Pretoria: Van Schaik
- Dufva, T., & Dufva, M. (2018). Grasping the future of the digital society. *Futures*, 107, 17-28. <https://doi.org/10.1016/j.futures.2018.11.001>
- Edeh, M. O., Edeh, C. C. D., Alhuseen, O. A., Quadri, N. H. N., & Sumaya, S. (2019). Online discussion forum as a tool for interactive learning and communication. *International Journal of Recent Technology and Engineering (IJRTE)*, 8(4), 4852 – 4859. DOI:10.35940/ijrte.D8062.118419
- Eder, R. B. (2020). The remoteness of remote learning. *Journal of Interdisciplinary Studies in Education*, 9, 168-171. <https://doi.org/10.32674/jise.v9i1.2172>
- Elkaseh, A. M., Wong, K. W., & Fung, C. C. (2016). Perceived ease of use and perceived usefulness of social media for e-learning in Libyan higher education: A structural equation modelling analysis. *International Journal of Information and Education Technology*, 6(3), 192-199. <https://doi.org/10.7763/IJiet.2016.V6.683>
- Elverici, S. E. (2021). Can social media promote social presence and attitude in EFL classes? *Turkish Online Journal of Distance Education-TOJDE*, 22(1), 133-147. <https://doi.org/10.17718/tojde.849893>

- Erlingsson, C., & Brysiewicz, P. (2017). A hands-on guide to doing content analysis. *African Journal of Emergency Medicine*, 7, 93 – 99. Erlingsson, C. & Brysiewicz, P. (2017). A hands-on guide to doing content analysis. *African Journal of Emergency Medicine*, 7, 93–99. <https://doi.org/10.1016/j.afjem.2017.08.001>
- European Commission. (2007). Key competences for life-long learning: European reference framework. Retrieved from: http://301ec.europa.eu/dgs/education_culture/publ/pdf/11-learn-302ing/eycomp_en.pdf . Date of access: 16 January, 2022.
- Faber, J., & Fonseca, L. M. (2014). How sample size influences research outcomes. *Dental Press Journal of Orthodontics*, 19(4), 27-29. <http://dx.doi.org/10.1590/2176-9451.19.4.027-029.ebo>
- Faja, S. (2013). Collaborative learning in online courses: exploring students' perceptions. *Information Systems Education Journal*, 11(3), 42-51. <https://www.scielo.br/j/dpjo/a/kJsVCrLstNgsvxkmxh9nGQF/abstract/?lang=en>
- Fan, W., & Yan, Z. (2010). Factors affecting response rates of the web survey a systematic review. *Computers in Human Behavior*, 26(1), 132–139. <https://doi.org/10.1016/j.chb.2009.10.015>
- Farid, S., Qadir, M., Ahmed, M. U., & Khattak, M. D. (2018). Critical success factors of e-learning systems: A quality perspective. *Pakistan Journal of Distance & Online Learning*, 4(1), 1-20. <http://pjdol.aiou.edu.pk/wp-content/uploads/2018/08/1-critical-success-factors-1.pdf>
- Farrell, O., & Brunton, J. (2020). A balancing act: a window into online student engagement experiences. *International Journal of Educational Technology in Higher Education*, 17(25), 1-19. <https://doi.org/10.1186/s41239-020-00199-x>
- Fatma, N., & Mustafa, E. (2016). The effects of student-content interaction on academic performance in distance-learning courses. *International Journal on New Trends in Education & Their Implications*, 7(3), 60-68.
- Favaretto, M., De Clercq, E., Gaab, J., & Elger, B. S. (2020). First do no harm: An exploration of researchers' ethics of conduct in Big Data behavioral studies. *PLoS One*, 15(11), 1-23. <https://doi.org/10.1371/journal.pone.0241865>
- Ferns, S., & Duffy, N. (2019). *Active learning strategies for higher education*. Dublin: Centre for Higher Education Research, Policy and Practice.
- Ferreira, J., Behrens, M., Torres, P., & Marriott, R. (2018). The necessary knowledge for online education: teaching and learning to produce knowledge. *Eurasia Journal of Mathematics, Science and Technology Education*, 14(6), 2097-2106. <https://doi.org/10.29333/ejmste/86463>
- Ferri, F., Grifoni, P., & Guzzo, T. (2020). Online learning and emergency remote teaching: opportunities and challenges in emergency situations. *Societies*, 10(86), 1-18. <https://doi.org/10.3390/soc10040086>
- Fetters, M. D. (2016). Haven't we always been doing mixed methods research? Lessons learned from the development of the horseless carriage. *Journal of Mixed Methods Research*, 10(1), 3–11. <https://doi.org/10.1177/1558689815620883>
- Ficapal-Cusía, P., & Boada-Grau, J. (2015). E-learning and team-based learning. Practical experience in virtual teams. *Procedia - Social and Behavioral Sciences*, 196, 69-74. <https://doi.org/10.1016/j.sbspro.2015.07.013>
- Fiock, H. S. (2020). Designing a community of inquiry in online courses. *International Review of Research in Open and Distributed Learning*, 2(1), 135-153. <https://doi.org/10.19173/orrodl.v20i5.3985>

- Florescu, M. H., & Pop-Pacurar, I. (2016). Is the fear of 'being wrong' a barrier for effective communication between students and professors? A survey study at Babes-Bolyai University Romania. *Acta Didactica Napocensia*, 9(2), 47-66.
- Fontanillas, T. R., Carbonell, M. R., & Catasús, M. G. (2016). E-assessment process: giving a voice to online students. *International Journal of Educational Technology in Higher Education*, 13(20), 1-14. <https://doi.org/10.1186/s41239-016-0019-9>
- Francis-Cracknell, A., Murphy, L., & Lalor, A. (2019). *Building Collaborative Practice and Graduate Attributes through Health Immersion in the Indo-Pacific*. PL-2965. Abstract from WCPT World Congress of Physical Therapy 2019, Geneva, Switzerland.
- Gallien, T., & Oomen-Early, J. (2008). Personalized versus collective instructor feedback in the online course room: Does type of feedback affect student satisfaction, academic performance and perceived connectedness with the instructor? *Internal Journal on E-Learning*, 7(3), 463-476.
- Gao, F., Zhang, T., & Franklin, T. (2013). Designing asynchronous online discussion environments: Recent progress and possible future directions. *British Journal of Educational Technology*, 44(3), 469-483. <https://doi.org/10.1111/j.1467-8535.2012.01330.x>
- García-Almeida, D. J., & Cabrera-Nuez, M. T. (2020). The influence of knowledge recipients' proactivity on knowledge construction in cooperative learning experiences. *Active Learning in Higher Education*, 21(1), 79-92. <https://doi.org/10.1177/1469787418754569>
- Garrison, D. R. (2007). Online community of inquiry review: social, cognitive, and teaching presence issues. *Journal of Asynchronous Learning Networks*, 11(1), 61-72.
- Garrison, D. R. (2009). Communities of inquiry in online learning. In *Encyclopedia of distance learning*, 2nd Eds (pp. 352-355). IGI Global. <https://doi.org/10.4018/978-1-60566-198-8.ch052>
- Garrison, D. R., Anderson, T., & Archer, W. (2001). Critical inquiry in a text-based environment: Computer conferencing in higher education. *The Internet and Higher Education*, 2(2), 87-105.
- Garrison, R. (2011). *E-learning in the 21st century: A framework for research and practice*. London: Routledge.
- Gay, L. R., Mills, G. E., & Airasian, P. (2012). *Educational Research: Competences for analysis and applications*. Boston: Pearson Education
- Geitz, G., Brinke, D. J., & Kirschner, P. A. (2015). Goal orientation, deep learning, and sustainable feedback in higher business education. *Journal of Teaching in International Business*, 26(4), 273-292. <http://dx.doi.org/10.1080/08975930.2015.1128375>
- Ghiara, V. (2020). Disambiguating the role of paradigms in mixed methods research. *Journal of Mixed Methods Research*, 14(1), 11-25. <https://doi.org/10.1177/1558689818819928>
- Ghosh, S., Nath, J., Agarwal, S., & Nath, A. (2012). Open and Distance Learning (ODL) education system: past, present and future – A systematic study of an alternative education system. *Journal of Global Research in Computer Science*, 3(4), 53-57.
- Gibson, C. B. (2017). Elaboration, generalization, triangulation, and interpretation: on enhancing the value of mixed method research. *Organizational Research Methods*, 20(2), 193-223.

- Gikandi, J. W., Morrow, D., & Davis, N. E. (2011). Online formative assessment in higher education: A review of the literature. *Computer Education*, 57(4), 2333-2351. <https://doi.org/10.1016/j.compedu.2011.06.004>
- Gil-Jaurena, I., Domínguez, D., & Ballesteros, B. (2020). Learning outcomes based assessment in higher distance education: a case study. *Open Learning: The Journal of Open and Distance Learning*, 37(2), 193 – 208. <https://doi.org/10.1080/02680513.2020.1757419>
- Gillett-Swan, J. (2017). The challenges of online learning supporting and engaging the isolated student. *Journal of Learning Design*, 10(1), 20-30. <https://doi.org/10.52004/jld.v9i3.293>
- Given, L. M. (2008). *The SAGE encyclopaedia of qualitative research methods* (Vols. 1-0). Thousand Oaks, CA: SAGE Publications. <https://doi.org/10.4135/9781412963909>
- Goñi, J., Cortázar, C., Alvares, D., Donoso, U., & Miranda, C. (2020). Is Teamwork Different Online Versus Face-to-Face? A Case in Engineering Education. *Sustainability*, 12(1), 1-18. <https://doi.org/10.3390/su122410444>
- Gover, A., Loukkola, T., & Peterbauer, H. (2019). *Student-centred learning: approaches to quality assurance*. Geneva: European University Association.
- Goyal, S. (2012). E-Learning: future of education. *Journal of Education and Learning*, 6(2), 239-242.
- Grant, C., & Osanloo, A. (2014). Understanding, selecting, and integrating a theoretical framework in dissertation research: Creating the blueprint for your “house”. *Administrative Issues Journal Education Practice and Research*, 4(2), 12-26. <https://doi.org/10.5929/2014.4.2.9>
- Green, J. K., Burrow, M. S., & Carvalho, L. (2020). Designing for transition: supporting teachers and students cope with emergency remote education. *Postdigital Science and Education*, 2(1), 906-922. <https://doi.org/10.1007/s42438-020-00185-6>
- Greenbank, P. (2003). The role of values in educational research: The case for reflexivity. *British Educational Research Journal*. 29(1), 791-801. 10.1080/0141192032000137303.
- Greene, J. (2010). Knowledge accumulation: Three views on the nature and role of knowledge in social science. In W. Luttrell (Ed.), *Qualitative educational research: Readings in reflexive methodology and transformative practice* (pp. 63–77). New York, NY: Routledge.
- Greenhow, C., & Galvin, S. (2020). Teaching with social media: evidence-based strategies for making remote higher education less remote. *Information and Learning Sciences*, 121(7/8), 513-524. <https://doi.org/10.1108/ILS-04-2020-0138>
- Greenhow, C., Galvin, S., & Staudt Willet, K. B. (2019). What should be the role of social media in education? *Policy Insights from the Behavioral and Brain Sciences*, 6(2), 178-185.
- Grix, J. (2004). *The Foundations of Research*. New York, NY: Palgrave Macmillan.
- Guba, E. G. (1981). Criteria for assessing the trustworthiness of naturalistic inquiries, *Educational Communication and Technology Journal*, 29(2), 75-91.
- Guest, G., Namey, E., & McKenna, K. (2017). How many focus groups are enough? Building an evidence base for nonprobability sample sizes. *Field Methods*, 29(1), 3–22. <https://doi.org/10.1177/1525822X16639015>
- Guetterman, T. C., Fetters, M. D., & Creswell, J. W. (2015). Integrating quantitative and qualitative results in health science mixed methods research through joint

- displays. *Annals of Family Medicine*, 13(6), 554-561.
<https://doi.org/10.1370/afm.1865>
- Gundumogula, (2020). Importance of focus groups in qualitative research. *International Journal of Humanities and Social Science*, 8 (11), 299-302.
 ff10.24940/theijhss/2020/v8/i11/HS2011-082ff. fahal-03126126
- Hadwin, A. F., Bakhtiar, A., & Miller, M. (2018). Challenges in online collaboration. Effects of scripting shared task perceptions. *International Journal of Computer-Supported Collaborative Learning*, 13(3), 301-329.
<https://doi.org/10.1007/s11412-018-9279-9>
- Hajibayova, L. (2017). Students' viewpoint: What constitutes presence in an online classroom? *Cataloging & Classification Quarterly*, 55(1), 1-12.
<https://doi.org/10.1080/01639374.2016.1241972>
- Haleem, A., Javaid, M., Quadri, M. A., & Suman, R. (2022). Understanding the role of digital technologies in education: A review. *Sustainable Operations and Computers*, 3(1), 275–285. <https://doi.org/10.1016/j.susoc.2022.05.004>
- Hamiti, M., Reka, B., & Baloghová, A. (2014). Ethical use of information technology in higher education, *Procedia–Social and Behavioural Sciences*, 116(1), 4411-4415. <https://doi.org/10.1016/j.sbspro.2014.01.957>
- Hammersley, M. (2013). *What Is Qualitative Research?* London: Bloomsbury Academic.
- Haque, E., Parvin, S., Akhter, F., & Shafin, S. (2022). A commentary on the importance of ethics in scientific research. *Journal of Agriculture and Aquaculture*, 4(1), 1-5. <https://doi.org/10.1002/lipd.12118>
- Hart, C. (2012). Factors associated with student persistence in an online program of study: A review of the literature. *Journal of Interactive Online Learning*, 11(1), 19-42.
- Hasiri, F. (2021). How to manage expectations in online classes: Guidelines and requirements. *TESL Ontario CONTACT Magazine*, 8–16.
- Hassan, S. U. N., Algahtani, F. D., Zrieq, R., Aldhadi, B. K., Atta, A., Obeidat, R. M., & Kadri, A. (2021). Academic self-perception and course satisfaction among university students taking virtual classes during the COVID-19 pandemic in the Kingdom of Saudi Arabia (KSA). *Education Sciences*, 11(3), 134-148.
<https://doi.org/10.3390/educsci11030134>
- Hastuti, I. D., Surahmat, S., & Sutarto, A. (2020). Interaction pattern of inquiry learning on data collection and presentation material at SDN 13 Ampenan. *Universal Journal of Educational Research*, 8(3), 942-947.
- Heale, R., & Noble, H. (2019). Integration of a theoretical framework into your research study. *Evidence-Based Nursing*, 22(2), 36-37.
<http://dx.doi.org/10.1136/ebnurs-2019-103077>
- Hehir, E., Zeller, M., Luckhurst, J., & Chandler, T. (2021). Developing student connectedness under remote learning using digital resources: A systematic review. *Education and Information Technologies*, 26(1), 6531-6548.
<https://doi.org/10.1007/s10639-021-10577-1>
- Helyer, R. (2015). Learning through reflection: The critical role of reflection in work-based learning (WBL). *Journal of Work-Applied Management*, 7(1), 15-27.
<https://doi.org/10.1108/JWAM-10-2015-003>
- Hewlett Foundation. (2017). Open educational resources [White Paper].
<http://www.hewlett.org/programs/education/open-educational-resources>

- Hilliard, L. P., & Stewart, M. K. (2019). Time well spent: creating a community of inquiry in blended first-year writing courses. *The Internet and Higher Education*, 41, 11-24. <https://doi.org/10.1016/j.iheduc.2018.11.002>
- Holmes, J., Moraes, O. R., Rickards, L., Steele, W., Hotker, M., & Richardson, A. (2022). Online learning and teaching for the SDGs—exploring emerging university strategies. *International Journal of Sustainability in Higher Education*, 23(3), 503-521. <https://doi.org/10.1108/IJSHE-07-2020-0278>
- Holz, S. (2017). “How can we address the 4 Cs of education online?” Retrieved from: <https://blog.neolms.com/how-can-we-address-the-4cs-of-education-online/>. Date of access: 16 March 2022.
- Houlden, S., & Veletsianos, G. (2020). Coronavirus pushes universities to switch to online classes – but are they ready? *The Conversation*, 12 March 2020. <https://theconversation.com/coronaviruspushes-universities-toswitch-to-online-classes-but-arethey-ready-132728>. Date of access: 15 June 2021.
- Huang, Q. (2018). Examining teachers’ roles in online learning. *The Euro CALL Review*, 6(2), 3-8. <https://doi.org/10.4995/eurocall.2018.9139>
- Huang, Q. (2019). Comparing teacher’s roles of F2F learning and online learning in a blended English course. *Computer Assisted Language Learning*, 32(3), 190-209. <https://doi.org/10.1080/09588221.2018.1540434>
- Humphrey, S. E., & Aime, F. (2014). Team microdynamics: Toward an organizing approach to teamwork. *Academy of Management Annals*, 8(1), 443-503. <https://doi.org/10.5465/19416520.2014.904140>
- Humphries, B., & Clark, D. (2021). An examination of student preference for traditional didactic or chunking teaching strategies in an online learning environment. *Research in Learning Technology*, 29(1), 1-12. <https://doi.org/10.25304/rlt.v29.2405>
- Hunter, J., & Ross, B. (2019). Does increased online interaction between instructors and students positively affect a student's perception of the quality of an online course? *Journal on Empowering Teaching Excellence*, 3(2), 21-31. <https://doi.org/10.15142/gwx5.jq07>
- Husain, F. N. (2020). Use of digital assessments: how to utilize digital bloom to accommodate online learning and assessments? *Asian Journal of Education and Training*, 7(1), 30-35.
- Huss, J., & Eastep, S. (2015). Faculty expectations toward their online courses: are they on the same screen with their students? *Journal of Inquiry & Action in Education*, 6(3), 15-41.
- Hussin, W. N. T. W., Harun, J., & Shukor, N. A. (2019). Online interaction in social learning environment towards critical thinking skill: A framework. *Journal of Technology and Science Education*, 9(1), 4-12. <https://doi.org/10.3926/jotse.544>
- Hylen, J. (2005). Open educational resources: Opportunities and challenges. Retrieved from: <http://www.oecd.org/dataoecd/1/49/35733548.doc>
- Ice, P., & Nagel, L. (2010). Introduction to the community of inquiry framework and applications for programmatic improvement. Proceedings of the 12th Annual Conference on World Wide Web Applications, Durban, 21-23 September 2010. Retrieved from: <http://www.zaw3.co.za>
- Inoue, Y. (2012). Virtual reality learning environments. In *Encyclopaedia of the Sciences of Learning* (pp. 3407–3410). <https://doi.org/10.1007/978>
- Institute of Distance Education (2020). *Blended Learning Quality Assurance Framework* (unpublished) Kwaluseni: UNESWA

- Iqbal, J., Mahmood, E., & Idrees, M. (2019). Effectiveness of self-instructional material of distance education. *Pakistan Journal of Distance & Online Learning*, 5(1), 71-90.
- Jaggers, S. S., & Xu, D. (2016). How do online course design features influence student performance? *Computers & Education*, 95(1), 270-284. <https://doi.org/10.1016/j.compedu.2016.01.014>
- Janssen, J., Stoyanov, S., Ferrari, A., Punie, Y., Pannekeet, K., & Sloep, P. (2013). Experts' views on digital competence: Commonalities and differences. *Computers & Education*, 68, 473-481. <https://doi.org/10.1016/j.compedu.2013.06.008>
- Jensen, L. X., Bearman, M., & Boud, D. (2021). Understanding feedback in online learning – A critical review and metaphor analysis. *Computers & Education*, 173(1), 1 – 12. <https://doi.org/10.1016/j.compedu.2021.104271>
- Jesson, J., Matheson, L., & Lacey, F. M. (2011). *Doing your literature review: traditional and systematic techniques*. London: SAGE Publications.
- Jinyoung, K. (2020). Learning and teaching online during Covid-19: Experiences of student teachers in an early childhood education practicum. *International Journal of Early Childhood*, 52, 145-158. <https://doi.org/10.1007/s13158-020-00272-6>
- Jogulu, U. D., & Pansiri, J. (2011). Mixed methods: A research design for management doctoral dissertations. *Management Research Review*, 34(6), 687-701. <https://doi.org/10.1108/01409171111136211>
- Johnson, R. B., Onwuegbuzie, A. J., & Turner, L. A. (2007). Toward a definition of mixed methods research. *Journal of Mixed Methods Research*, 1(2), 112-133. <https://doi.org/10.1177/1558689806298224>
- Johnston, A. (2014). Rigour in research: theory in the research approach. *European Business Review*, 26(3), 206-217. <https://doi.org/10.1108/EBR-09-2013-0115>
- Jones, T. L., Baxter, M. A. J., & Khanduja, V. (2013). A quick guide to survey research. *Annals Royal College of Surgeons*, 96(1), 87-87. <https://doi.org/10.1308/003588413X13511609956372>
- Jordaan, N. (2020). Half of university students don't have resources such as laptops and data to study from home. The Sowetan, 18 August 2020.
- Jung, S., & Huh, J. H. (2019). An efficient LMS platform and its test bed. *Electronics*, 8(2), 154. <https://www.mdpi.com/2079-9292/8/2/154/htm>
- Kahu, E. R., Stephens, C., Zepke, N., & Leach, L. (2014). Space and time to engage: Mature-aged distance students learn to fit study into their lives. *International Journal of Lifelong Education*, 33(4), 523-540. <https://doi.org/10.1080/02601370.2014.884177>
- Kaliyadan, F., & Kulkarni, V. (2019). Types of variables, descriptive statistics, and sample size. *Indian Dermatology Online Journal*, 10(1), 82-86. https://doi.org/10.4103/idoj.IDOJ_468_18
- Kaplan, A. M., & Haenlein, M. (2010). Users of the world, unite! The challenges and opportunities of social media. *Business Horizons*, 53(1), 59-68. <https://doi.org/10.1016/j.bushor.2009.09.003>
- Kaplan, R. M., & Saccuzzo, D. P. (2017). *Psychological testing: Principles, applications, and issues*. Toronto: Nelson Education.
- Kaplan-Rakowski, R. (2020). Addressing students' emotional needs during the COVID-19 pandemic: A perspective on text versus video feedback in online environments. *Educational Technology Research and Development*, 69, 133-136. <https://doi.org/10.1007/s11423-020-09897-9>

- Kauffman, H. (2015). A review of predictive factors of student success in and satisfaction with online learning. *Research in Learning Technology*, 23(1), 1-13. <https://doi.org/10.3402/rlt.v23.26507>
- Keaton, W., & Gilbert, A. (2020). Successful online learning: What does student interaction with peers, instructors and parents look like? *Journal of Online Learning Research*, 6(2), 129 -154. Retrieved from: <https://www.learntechlib.org/primary/p/215616> on 2 March 2021
- Keegan, D. (1988). Problems in defining the field of distance education. *The American Journal of Distance Education*, 2(2), 4-11.
- Kenny, A. (2002). Online learning: enhancing nurse education? *Journal of Advanced Nursing*, 38(2), 127-135. <https://doi.org/10.1046/j.1365-2648.2002.02156.x>
- Kenwright, B. (2018). Virtual reality: ethical challenges and dangers. *IEEE Technology and Society Magazine*, 37(4), 20-25. <https://doi.org/10.1109/MTS.2018.2876104>
- Kerlinger, F. N., & Lee, H. B. (2000). *Foundations of behavioural research*. (4th Edn). Belmont, CA: Cengage Learning.
- Khan, A., Egbue, O., Palkie, B., & Madden, J. (2017). Active learning: engaging students to maximize learning in an online course. *The Electronic Journal of e-Learning Volume*, 15(2), 107-115. <https://academic-publishing.org/index.php/ejel/article/view/1824>
- Khan, A. M., Patra, S., Vaney, N., Mehndiratta, M., & Chauhan, R. (2021). Rapid transition to online practical classes in preclinical subjects during COVID-19: Experience from a medical college in North India. *Medical Journal, Armed Forces India*, 77(1), S161-S167. doi: 10.1016/j.mjafi.2020.12.030.
- Khatwani, M. K., & Panhwar, F. Y. (2019). Objectivity in social research: A Critical analysis. *Asia Pacific*, 37(1), 126–142. <https://www.academia.edu/download/68280523/512.pdf>
- Khurshid, F. (2020). E-pedagogical skills of online instructors: an exploratory study. *Bulletin of Education and Research*, 42(2), 235-250. http://pu.edu.pk/images/journal/ier/PDF-FILES/15_42_2_20.pdf
- Kebritchi, M., Lipschuetz, A., & Santiago, L. (2017). Issues and Challenges for Teaching Successful Online Courses in Higher Education. *Journal of Educational Technology Systems*, 46(1), 4–29. <https://doi.org/10.1177/0047239516661713>
- Kiger, M. E., & Varpio, L. (2020). Thematic analysis of qualitative data. *Medical Teacher*, 42(1), 1-9. <https://doi.org/10.1080/0142159X.2020.1755030>
- Kilinc, H., & Altinpulluk, H. (2021). Use of discussion forums in online learning environments, 2nd World Conference on Teaching and Education. 19 – 21 February 2021. Vienna, Austria
- Kim, C., Park, S., Cozart, J., & Lee, H. (2015). From motivation to engagement: the Role of effort regulation of virtual high school students in mathematics courses. *Journal of Educational Technology & Society*, 18(4), 261-272. <https://www.jstor.org/stable/10.2307/jeductechsoci.18.4.261>
- Kim, S., & Kim, D. J. (2021). Structural relationship of key factors for student satisfaction and achievement in asynchronous online learning. *Sustainability*, 13(12), 1-14. <https://doi.org/10.3390/su13126734>
- Kimmons, R. (2018). Technology Integration: Effectively Integrating Technology in Educational Settings. In A. Ottenbreit-Leftwich & R. Kimmons. *The K-12 Educational Technology Handbook*. EdTech Books. Retrieved from:

- https://edtechbooks.org/k12handbook/technology_integration. Date of access: 20 January, 2022.
- Kimmons, R., Graham, C., & West, R. (2020). The PICRAT model for technology integration in teacher preparation. *Contemporary Issues in Technology and Teacher Education*, 20(1), 176-198.
- Kivunja, C. (2018). Distinguishing between theory, theoretical framework, and conceptual framework: a systematic review of lessons from the field. *International Journal of Higher Education*, 7(6), 44-53. <https://doi.org/10.5430/ijhe.v7n6p44>
- Kivunja, C., & Kuyini, A. B. (2017). Understanding and applying research paradigms in educational contexts. *International Journal of Higher Education*, 6(5), 26-41. <https://doi.org.10.5430/ijhe.v6n5p26>
- Kock, N., Gallivan, M. J., & DeLuca, D. (2008). Furthering information systems action research: A post-positivist synthesis of four dialectics. *Journal of the Association for Information Systems*, 9(2), 48–72. <https://doi.org/10.17705/1jais.00150>
- Koenen, A., Dochy, F., & Berghmans, I. (2015). A phenomenographic analysis of the implementation of competence-based education in higher education. *Teaching and Teacher Education*, 50, 1-12. <https://doi.org/10.1016/j.tate.2015.04.001>
- Kondra, A. Z., Huber, C., Michalczyk, K., & Woudstra, A. (2011). Call Centres in Distance Education. In T. Anderson (Ed). *The Theory and Practice of Online Learning* (367–398). Athabasca University: AU Press.
- Kormaz, O. (2012). Validity and reliability study of the Online Cooperative Learning Attitude Scale (OCLAS) *Computers and Education*, 59(4), 1162-1169. <https://doi.org/10.1016/j.compedu.2012.05.021>
- Korstjens, I., & Moser, A. (2018). Series: Practical guidance to qualitative research. Part 4: Trustworthiness and publishing, *European Journal of General Practice*, 24(1), 120-124. <https://doi.org/10.1080/13814788.2017.1375092>
- Koslow, A., & Piña, A. A. (2015). Using transactional distance theory to inform online instructional design. *Instructional Technology*, 12(10), 63-72.
- Kotera, Y., Chircop, J., Hutchinson, L., Rhodes, C., Green, P., Jones, R. M., Kaluzeviciute, G., & Garip, G. (2021). Loneliness in online students with disabilities: Qualitative investigation for experience, understanding and solutions. *International Journal of Educational Technology in Higher Education*, 18(64), 1-16. <https://doi.org/10.1186/s41239-021-00301-x>
- Kozan, K., & Caskurlu, S. (2018). On the Nth presence for the community of inquiry framework. *Computers & Education*, 122, 104-118. <https://doi.org/10.1016/j.compedu.2018.03.010>
- Krauss, S. E. (2005). Research paradigms and meaning making: A primer. *The Qualitative Report*, 10(4), 758-770.
- Krouwel, M., Jolly, K., & Greenfield, S. (2019). Comparing Skype (video calling) and in-person qualitative interview modes in a study of people with irritable bowel syndrome – an exploratory comparative analysis. *BMC Medical Research Methodology*, 19(219), 1-9. <https://doi.org/10.1186/s12874-019-0867-9>
- Krueger, R. A. (1994). *Focus Groups: A Practical Guide for Applied Research*. Thousand Oaks, CA: Sage.
- Kuada, J. (2012). *Research methodology: a project guide for university students* (1st ed.). Samfundslitteratur. https://scholar.google.com/scholar?hl=en&as_sdt=0%2C5&q=Krueger%2C+R.+A.+%281994%29.+Focus+Groups%3A+A+Practical+Guide+for+Applied+R

- [esearch.+Thousand+Oaks%2C+CA%3A+Sage.++&btnG](#). Date of access: 16 September 2021.
- Kühl, T., & Wohninsland, P. (2022). Learning with the interactive whiteboard in the classroom: Its impact on vocabulary acquisition, motivation and the role of foreign language anxiety. *Education and Information Technologies*, 27(2), 10.1007/s10639-022-11004-9.
- Kukard, K. (2020). Creating a collaborative learning environment online and in a blended history environment during COVID-19. *Yesterday & Today*, 24, 205-218.
- Kuloglu, E. A., & Yildiz, S. (2022). Undergraduates' attitudes towards distance education and perceptions of readiness for e-learning during the COVID-19 pandemic. *Turkish Online Journal of Distance Education*, 23(4), 121 – 130. Doi: 10.17718-tojde.1182767-2682039
- Kumar, P., & Kumar, N. (2020). A study of student's satisfaction from MOOCs through a mediation model. *Procedia Computer Science*, 173(1), 354-363. <https://doi.org/10.1016/j.procs.2020.06.041>
- Kumar, P., Saxena, C., & Baber, H. (2021). Student-content interaction in e-learning- the moderating role of perceived harm of COVID-19 in assessing the satisfaction of students. *Smart Learning Environments*, 8(5), 1-15. <https://doi.org/10.1186/s40561-021-00149-8>
- Kumar, R. (2019). *Research Methodology: a step- by- step guide for beginners*, (5th ed.). London: SAGE Publication Ltd.
- Kumar, S. (2018). Understanding different issues of unit of analysis in business research. *Journal of General Management Research*, 5(2), 70-82.
- Kurnaz, F. B., Ergün, E., & Ilgaz, H. (2018). Participation in online discussion environments: Is it really effective? *Education Information Technology*, 23(1):1719–1736 <https://doi.org/10.1007/s10639-018-9688-4>
- Lam, P. (2018). A Review of paradigms, positivism, interpretivism and critical inquiry. <https://doi.org/10.13140/RG.2.2.13995.54569>
- Lasfeto, D. (2020). The relationship between self-directed learning and students' social interaction in an online learning environment. *Journal of E-Learning and Knowledge Society*, 16(2), 34-41. <https://doi.org/10.20368/1971-8829/1135078>
- Laurillard, D. (2013). *Rethinking university teaching: A conversational framework for the effective use of learning technologies*. London: Routledge.
- Laurillard, D. (2012). *Teaching as a design science. Building pedagogical patterns for learning and technology*. London: Routledge.
- Le, H., Janseen, J., & Wubbels, T. (2018). Collaborative learning practices: teacher and student perceived obstacles to effective student collaboration. *Cambridge Journal of Education*, 48(1), 103-122. <https://doi.org/10.1080/0305764X.2016.1259389>
- Lee, K. (2020). Coronavirus: Universities are shifting classes online- but it's not easy as it sounds. Retrieved from: <https://theconversation.com/coronavirus-universities-are-shiftingclasses-online-but-its-not-as-easy-as-it-sounds-133030>. Date of access: 20 February 2021.
- Letourneau, N., & Allen, M. (2006). Post-positivistic critical multiplism: A beginning dialogue. In W. K. Cody (Ed.), *Philosophical and theoretical perspectives for advanced nursing practice* (pp. 221-231). Boston, MA: Jones and Bartlett Publishers.

- Letseka, M., Letseka, M. M., & Pitsoe, V. P. (2018). *The Challenges of E-learning in South Africa*. London: IntechOpen
- Levers, M. D. (2013). Philosophical paradigms, grounded theory, and perspectives on emergence. *SAGE Open*, 3(4), 1-6. <https://doi.org/10.1177/2158244013517243>
- Ley, K., & Gannon-Cook, R. (2014). Student-valued interactions. *Quarterly Review of Distance Education*, 15(1), 23-32.
- Lim, J. S. Y., Agostinho, S., Harper, B., & Chicharo, J. (2014). The engagement of social media technologies by undergraduate informatics students for academic purpose in Malaysia. *Journal of Information, Communication and Ethics in Society*, 12(3), 177-194. <https://doi.org/10.1108.JICES-03-2014-0016>
- Lima, D. P. R., Gerosa, M. A., Conte, T. U., & Netto, J. F. M. (2019). What to expect, and how to improve online discussion forums: the instructors' perspective. *Journal of Internet Services and Applications*, 10(22), 1-15. <https://doi.org/10.1186/s13174-019-0120-0>
- Limniou, M. (2021). The effect of digital device usage on student academic performance: a case study. *Educational Sciences*. 11(3), 121-136. <https://doi.org/10.3390/educsci11030121>
- Lin, S. H., & Huang, Y. C. (2012). Investigating the relationships between loneliness and learning burnout. *Active Learning in Higher Education*, 13(3), 231-243. <https://www.learntechlib.org/p/90308/>
- Lin, X., Hmelo, C., Kinzer, C. K., & Secules, T. J. (1999). Designing technology to support reflection. *Educational Technology Research and Development*, 47(3), 43-62. <https://doi.org/10.1007/BF02299633>
- Linake, M., Maphosa, C., & Mthethwa-Kunene, K. E. (2022). The synergy between paradigms and research approaches. In E. Adu & C. Okeke *Fundamentals of Research in Humanities, Social Sciences and Science Education*. (p 90 - 97) Pretoria: Van Schaik
- Lincoln, Y. S., & Guba, E. A. (1985). *Naturalist inquiry*. Beverly Hills, CA: Sage.
- Littlefield, J. (2018). The difference between synchronous and asynchronous distance learning. <https://www.thoughtco.com/synchronous-distance-learning-asynchronousdistance-learning-1097959>. Date of access: 2 December, 2021
- Lockee, B. B. (2021). Online education in the post-COVID era. *Nature Electronics*, 4, 5-6. <https://doi.org/10.1038/s41928-020-00534-0>
- Loo, I. D., & Lowe, A. (2011). Mixed methods research: don't- "just do it" *Qualitative Research in Accounting & Management*, 8(1), 22-38. <https://doi.org.10.1108/117660911111124685>
- Lubbe, A., & Mentz, E. (2021). 'Self-directed learning-oriented assessment and assessment literacy: Essential for 21st-century learning', in E. Mentz & A. Lubbe (eds.), *Learning through assessment: An approach towards Self-Directed Learning* (NWU Self-Directed Learning Series Volume 7), pp. 1–25, AOSIS, Cape Town. <https://doi.org/10.4102/aosis.2021.BK280.01>
- Luck, J., & Rossi, D. (2015). University policy vs students' expectations: Investigating students' perceptions of online learning. *International Journal on E-Learning*, 14(4), 471-485.
- Lumadi, R. I. (2021). Enhancing Student Development through Support Services in an Open Distance Learning Institution: A Case Study in South Africa. *South African Journal of Higher Education*, 35(1), 113–126 <https://dx.doi.org/10.20853/35-1-4422>

- Lynch, M. (2020). E-Learning during a global pandemic. *Asian Journal of Distance Education*, 15(1), 189-195.
- Lytje, M., Nielsen, T. K., & Jørgensen, M. O. (Eds.). (2015). *Challenging ideas: theory and empirical research in the social sciences and humanities*. Cambridge: Cambridge Scholars Publishing.
- Ma, W. W. K., Sun, K., & Ma, J. (2012). The Influence of Cognitive Learning Styles on the Use of Online Learning Environments. In: Cheung, S. K. S., Fong, J., Kwok, L. F., Li, K., Kwan, R. (eds) *Hybrid Learning. ICHL 2012. Lecture Notes in Computer Science*, Vol 7411. Springer, Berlin, Heidelberg. https://doi.org/10.1007/978-3-642-32018-7_21
- Maggio, L. A., Sewell, J. L., & Artino, A. R. (2016). The literature review: a foundation for high-quality medical education research. *Journal of Graduate Medical Education*, 8(3), 297-303. <https://doi.org/10.4300/JGME-D-16-00175.1>
- Malatji, S. K. (2016). Moving away from rote learning in the university classroom: the use of cooperative learning to maximise students' critical thinking in a rural university of South Africa. *Journal of Communication*, 7(1), 34-42.
- Malecka, B., Boud, D., & Carless, D. (2020). Eliciting, processing and enacting feedback: Mechanisms for embedding student feedback literacy within the curriculum. *Teaching in Higher Education*, 1-15. <https://doi.org/10.1080/13562517.2020.1754784>
- Malmqvist, J., Hellberg, K., Möllås, G., Rose, R., & Shevlin, M. (2019). Conducting the pilot study: a neglected part of the research process? Methodological findings supporting the importance of piloting in qualitative research studies. *International Journal of Qualitative Methods*, 18, 1-11. <https://doi.org/10.1177/1609406919878341>
- Maphosa, C., & Bhebhe, S. (2020). Interrogating the concept 'openness' in Open Distance Learning (ODL). *European Journal of Open Education and E-learning Studies*, 5(2), 16-29. <http://dx.doi.org/10.46827/ejoe.v5i2.3282>
- Maphosa, C., & Bhebhe, S. (2019). Digital literacy: a must for open distance and e-learning (ODEL) students. *European Journal of Education Studies*, 5(10), 186-199. <http://dx.doi.org/10.46827/ejes.v0i0.2274>
- Maphosa, C., Mthethwa-Kunene, E. K., & Rugube, T. (2020). Quality assuring online learning using the Commonwealth of Learning Regional Community of Practice for Quality Assurance Guidelines. *US-China Education Review*, 10(5), 201-211. <https://doi.org/10.17265/2161-623X/2020.05.001>
- Maphosa, C., Rugube, T., Mthethwa-Kunene, K. E. & Dlamini, P. (2022). Understanding the experienced opportunities and threats of online learning in a professional development programme. *European Journal of Education and Pedagogy* 3(3), 242-250. <https://doi.org/10.24018/ejedu.2022.3.3.366>
- Maphosa, C., Van Den Berg, G., & Mudau, P. K. (2021). Assessment of the perceived usefulness of mobile phone technology for communication in learning by distance education students in a rural-based university. *African Perspectives of Research in Teaching & Learning*, 5(2), 45-61. https://www.ul.ac.za/aportal/application/downloads/Article%204_5_2_nov_2021.pdf
- Martin, F., & Bolliger, D. U. (2018). Engagement matters: Student perceptions on the importance of engagement strategies in the online learning environment. *Online Learning*, 22(1), 205-222. <https://doi.org/10.24059/olj.v22i1.1092>
- Martin, F., Ritzhaupt, A., Kumar, S., & Budhrani, K. (2019). Award-winning faculty online teaching practices: Course design, assessment and evaluation, and

- facilitation. *The Internet and Higher Education*, 42(1),34-43.doi.org/10.1016/j.iheduc.2019.04.001.
- Martin, F., Wang, C., & Sadaf, A. (2018). Student perception of helpfulness of facilitation strategies that enhance instructor presence, connectedness, engagement and learning in online courses. *The Internet and Higher Education*, 37(1), 52-65. <https://doi.org/10.1016/j.iheduc.2018.01.003>
- Martin, F., Wang, C., & Sadaf, A. (2020). Facilitation matters: instructor perception of helpfulness of facilitation strategies in online courses. *Online Learning*, 24(1), 28-49. <https://doi.org/10.24059/olj.v24i1.1980>
- Masadeh, M. A. (2012). Focus group: reviews and practices. *International Journal of Applied Science and Technology*, 2(10), 63-68.
- Mason, L., & Bromme, R. (2010). Situating and relating epistemological beliefs into metacognition: Studies on beliefs about knowledge and knowing. *Metacognition Learning*, 5(1), 1-6. <https://doi.org/10.1007/s11409-009-9050-8>
- Mathrani, A., Sarvesh, T., & Umer, R. (2021). Digital divide framework: online learning in developing countries during the COVID-19 lockdown. *Globalisation, Societies and Education*, 1-16. <https://doi.org/10.1080/14767724.2021.1981253>
- May, K. E., & Elder, A. D. (2018). Efficient, helpful, or distracting? A literature review of media multitasking in relation to academic performance. *International Journal of Educational Technology in Higher Education*, 15(1), 1-17. <https://doi.org/10.1186/s41239-018-0096-z>
- Mayanja, J., Tibaingana, A., & Birevu, P. M. (2019). Promoting Student Support in Open and Distance Learning Using Information and Communication Technologies. *Journal of Learning for Development*, 6(2), 177-186.
- Mbithi, P. M. F., Mbau, J. S., Muthama, N. J., Inyega, H., & Kalai, J. M. (2021). Higher education and skills development in Africa: An analytical paper on the role of higher learning Institutions on sustainable development. *Journal of Sustainability, Environment and Peace*, 4(2) 58-73. <https://doi.org/10.53537/jsep.2021.08.001>
- McCollum, B. M., Morsch, L., Pinder, C., Ripley, I., Skagen, D., & Wentzel, M. (2019). Multidimensional trust between partners for international online collaborative learning in 'The Third Space'. *International Journal of Students as Partners*, 3(1), 50-59. <https://doi.org/10.15173/ijsap.v3i1.3730>
- McInnes, R. (2019). Developing multimedia collaboratively: Practical approaches for large-scale online curriculum development. *Journal of University Teaching & Learning Practice*, 16(1), 1-15. <https://doi.org/10.53761/1.16.1.8>
- McLoughlin, C., & Lee, M. J. W. (2011). Pedagogy 2.0: Critical challenges and responses to Web 2.0 and social software in tertiary teaching. In M. J. W. Lee & C. McLoughlin (Eds.), *Web 2.0-based e-learning: Applying social informatics for tertiary teaching* (pp. 43-69). Hershey, PA: Information Science Reference. <https://doi.org/10.4018/978-1-60566-294-7.ch003>
- McMillan, J. H., & Schumacher, S. (2010). *Research in education – Evidence-based inquiry*. (7th ed.) Boston: Pearson Education Inc. <https://eric.ed.gov/?id=ED577250>
- McMurtry, A. (2020). Relief for the exhausted post-positivist: New epistemological choices transcend positivism, relativism, and even post-positivism. *Canadian Medical Education Journal*, 11(6), 1-2. [10.36834/cmej.71217](https://doi.org/10.36834/cmej.71217)

- Mehall, S. (2020). Purposeful interpersonal interaction in online learning: What is it and how is it measured? *Online Learning*, 24(1), 182-204. <https://doi.org/10.24059/olj.v24i1.2002>
- Mehta, R., & Aguilera, E. (2020). A critical approach to humanizing pedagogies in online teaching and learning. *The International Journal of Information and Learning Technology*, 37(3), 109-120. <https://doi.org/10.1108/IJILT-10-2019-0099>
- Meijer, H., Hoekstra, R., Brouwer, J., & Strijbos, J. W. (2020). Unfolding collaborative learning assessment literacy: a reflection on current assessment methods in higher education, *Assessment & Evaluation in Higher Education*, 45(8), 1222-1240. <https://doi.org/10.1080/02602938.2020.1729696>
- Melham, K., Moraia, L. B., Mitchell, C., Morrison, M., Teare, H., & Kaye, J. (2014). The evolution of withdrawal: negotiating research relationships in biobanking. *Life Sciences, Society and Policy*, 10(16), 1-13. <http://www.lsspjournal.com/content/10/1/16>
- Menken, S. B. J., & Keestra, M. (Eds.). (2016). *An introduction to interdisciplinary research: theory and practice* (Ser. Perspectives on interdisciplinarity, volume 2). Amsterdam University Press. Retrieved September 16, 2021.
- Mertens, D. (1998). *Research methods in education and psychology: Integrating diversity with quantitative and qualitative approaches*. Thousand Oaks: Sage.
- Mettas, A. (2011). The development of decision-making skills. *Eurasia Journal of Mathematics, Science & Technology Education*, 7(1), 63-73. <https://doi.org.12973/ejmste/75180>
- Miller, F. G. (2016). Henry Beecher and Consent to Research: a critical re-examination. *Perspectives in Biology and Medicine*, 59(1), 78-94. <https://doi.org/10.1353/pmb.2016.0015>
- Ministry of Education and Training (2018). *National Education and Training Sector Policy*. Mbabane: Eswatini Ministry of Education and Training.
- Ministry of Education and Training (2021). *The Eswatini National Open and Distance Learning Policy*. Mbabane: Ministry of Education and Training.
- Mkhonta-Khoza, P. P., & Rugube, T. T. (2021). Why the BigBlueButton as “the” on-time inclusive online teaching and learning platform. *IOSR Journal of Humanities and Social Science*, 26(11), 8–14. <https://doi.org/10.9790/0837-2611010814>
- Mohajan, H. K. (2017). Two criteria for good measurements in research: validity and reliability. *Annals of Spiru Haret University*, 17(3), 58–82.
- Mohamedhosein, N., & Crul, M. (2018). The relationship between first-year students’ interaction, basic psychological needs, and academic success. *American Journal of Educational Research*, 6(2), 1702-1709. <https://doi.org/10.12691/education-6-12-17>
- Molina-Azorin, J. F. (2016). Mixed methods research: An opportunity to improve our studies and our research skills. *European Journal of Management and Business Economics*, 25, 37–38. <http://dx.doi.org/10.1016/j.redeen.2016.05.001>
- Molina-Azorin, J. F., Tari, J. J., Lopez-Gamero, M. D., Pereira-Moliner, J., & Pertusa-Ortega, E.M. (2018). The implementation and advantages of mixed methods in competitive strategy and management systems. *International Journal of Multiple Research Approaches*, 10(1), 412-421.

- Montrezor, L. H. (2021). Lectures and collaborative working improve the performance of medical students. *Advances in Physiology Education*, 45(1), 18–23. <https://doi.org/10.1152/advan.00121.2020>
- Moore, J. C. (2011). A synthesis of Sloan-C effective practices. *Journal of Asynchronous Learning Networks*, 16(1), 91-115.
- Moore, M. (1997). Theory of transactional distance. In Keegan, D., (Ed). *Theoretical Principles of Distance Education* (pp. 22-38). London: Routledge.
- Moore, M. G. (1989). Editorial: Three types of interaction. *American Journal of Distance Education*, 3(2), 1-7. <https://www.tandfonline.com/doi/pdf/10.1080/08923648909526659>
- Moore, R. L. (2016). Interacting at a distance: Creating engagement in online learning environments. In K. B. Lydia, B. Joseph, N. Esther, & A. Cynthia (Eds.), *Handbook of Research on Strategic Management of Interaction, Presence, and Participation in Online Courses* (pp. 401-425). Hershey, PA, USA: IGI Global. <https://doi.org/10.4018/978-1-4666-9582-5.ch016>
- Moore, T., McKee, K., & McLoughlin, P. (2015). Online focus groups and qualitative research in the social sciences: their merits and limitations in a study of housing and youth. *People, Place and Policy*, 9(1), 17-28. <https://doi.org/10.3351/ppp.0009.0001.0002>
- Morris, E., & Burkett, K. (2011). Mixed Methodologies: A New Research Paradigm or Enhanced Quantitative Paradigm. *Online Journal of Cultural Competence in Nursing and Healthcare*. 1(1). 27-36. [10.9730/ojccnh.org/v1n1a3](https://doi.org/10.9730/ojccnh.org/v1n1a3).
- Morrison, G., Ross, S., Kemp, J., & Kalman, H. (2011). *Designing effective instruction*. Hoboken, NJ: Wiley.
- Mpungose, C. (2020). Beyond limits: Lecturers' reflections on Moodle uptake in South African universities. *Education and Information Technologies*, 25(6), 5033-5052. <https://doi.org/10.1007/s10639-020-10190-8>
- Mpungose, C. B., & Khoza, S. B. (2020). Postgraduate students' experiences on the use of Moodle and Canvas Learning Management System. *Technology, Knowledge and Learning*. *Technology, Knowledge and Learning*, 1-16. <https://doi.org/10.1007/s10758-020-09475-1>
- Mthethwa-Kunene, K. E., & Maphosa, C. (2020). An analysis of factors affecting utilisation of Moodle Learning Management System by open and distance learning students at the University of Eswatini. *American Journal of Social Sciences and Humanities*, 5(1), 17-32. <https://ideas.repec.org/a/onl/ajossh/v5y2020i1p17-32id168.html>
- Mthethwa-Kunene, K. E., Rugube, T., & Maphosa, C. (2020). Creating students' communities of Inquiry (COI) in online learning using the Moodle LMS. *Journal of Education and Practice*, 11(30), 143–150. <https://doi.org/10.7176/JEP/11-30-18>
- Mthethwa-Kunene, K., Rugube, T., & Maphosa, C. (2022). Rethinking pedagogy: interrogating ways of promoting deeper learning in higher education. *European Journal of Interactive Multimedia and Education*, 3(1), 1-6. <https://doi.org/10.30935/ejimed/11439>
- Mtshali, M. A., Maistry, S. M., & Govender, D. W. (2020). Online discussion forum: A tool to support learning in business management education. *South African Journal of Education*, 40(2), 1-9. <https://doi.org/10.15700/saje.v40n2a1803>
- Mu, S., & Wang, X. J. (2019). Research on deep learning strategies in online learning. *Journal of Distance Education in China*, 10, 29-39.
- Muljana, P. S., & Luo, T. (2019). Factors contributing to student retention in online

- learning and recommended strategies for improvement: A systematic literature review. *Journal of Information Technology Education Research*, 18(1), 19 - 57.
- Myneni, S. R. (2014). *Legal research methodology*. Faridabad: Allahabad Law Agency.
- Nami, F., Marandi, S. S., & Sotoudehnama, E. (2018). Interaction in a discussion list: An exploration of cognitive, social, and teaching presence in teachers' online collaborations. *ReCALL*, 30(3), 375 - 398.
- Nasir, J. A., & Khan, N. A. (2018). Faculty member usage of social media and mobile devices in a higher education institution. *International Journal of Advance and Innovative Research*, 6(1), 17-25.
- Nawaz, A., & Khan, M. Z. (2012). Issues of technical support for e-learning systems in higher education institutions. *International Journal of Modern Education and Computer Science*, 2(1), 38-44. <https://doi.org/10.5815/ijmeecs.2012.02.06>
- Nayak, M., & Narayan, K. A. (2019). Strengths and Weakness of Online Surveys. *Journal of Humanities and Social Sciences*, 24(5), 31-38. 10.9790/0837-2405053138.
- Ndzinisa, N., & Dlamini, R. (2022). Responsiveness vs. accessibility: pandemic-driven shift to remote teaching and online learning. *Higher Education Research & Development*, 1–16. <https://doi.org/10.1080/07294360.2021.2019199>
- Neier, S., & Zaye, L. T. (2015). Students' perceptions and experiences of social media in higher education. *Journal of Marketing Education*, 37(3), 33-143. <https://doi.org/10.1177/0273475315583748>
- Neri, M. T., & Kroll, T. (2009). Designs for mixed methods research. In S, Andrew & Halcomb, E. *Mixed Methods Research for Nursing and Health Sciences* (pp 31 - 49). Hoboken: Wiley-Blackwell.
- Nguyen, T. T. L. (2019). Selection of research paradigms in English Language teaching: personal reflections and future directions. In The Second Annual International Conference on Language and Literature, KnE Social Sciences, 1–19. <https://doi.org/10.18502/ss.v3i19.4826>
- Nieuwoudt, J. (2018). Exploring online interaction and online student participation in an online science subject through the lens of the interaction equivalence theorem. *Student Success*, 9(4), 53-62. <https://doi.org/10.5204/ssj.v10i1.424>
- Noble, W., & Smith, J. (2015). Issues of validity and reliability in qualitative research. *Evidence-based Nursing*, 18(2), 1-4. <http://dx.doi.org/10.1136/eb-2015-102054>
- Nooijer, J. D., Schneider, F., & Verstegen, D. M. L. (2021). Optimizing collaborative learning in online courses. *The Clinical Teacher*, 18(1), 19-23.
- Nowell, L. S., Norris, J. M., White, D. E., & Moules, N. J. (2017). Thematic analysis: striving to meet the trustworthiness criteria. *International Journal of Qualitative Methods*. 16, 1-13. <https://doi.org/10.1177/1609406917733847>
- Nyumba, T. O., Wilson, K., Derrick, C. J., & Mukherjee, N. (2018). The use of focus group discussion methodology: Insights from two decades of application in conservation. *Methods in Ecology and Evolution*. 9(1), 20-32. <https://doi.org/10.1111/2041-210X.12860>
- O'Cathain, A., Murphy, E., & Nicholl, J. (2010). Three techniques for integrating data in mixed methods studies. *BMJ*, 341, 1147-1150. <https://doi.org/10.1136/bmj.c4587>
- Ochieng, N. T., Wilson, K., Derrick, C. J., & Mukherjee, N. (2018). The use of focus group discussion methodology: Insights from two decades of application in

- conservation. *Methods in Ecology and Evolution*, 9(1), 20-32. <https://doi.org/10.1111/2041-210X.12860>
- Ogbonna, C. G., Ibezim, N. E., & Obi, C. A. (2019). Synchronous versus asynchronous e-learning in teaching word processing: An experimental approach. *South African Journal of Education*, 39, 1–15. doi: 10.15700/saje.v39n2a1383
- Oluwatayo, J. A. (2012). Validity and reliability issues in educational research. *Journal of Educational and Social Research*, 2(2), 391-400. <https://doi.org/10.5901/jesr.2012.v2n2.391>
- Ong, P. M. (2020). COVID-19 and the digital divide in virtual learning, *Fall 2020*. UCLA Center for Neighborhood Knowledge.
- Onyema, E. M., Deborah, E. C., Alsayed, A. O., Noorulhasan, Q., & Sanober, S. (2019). Online discussion forum as a tool for interactive learning and communication. *International Journal of Recent Technology and Engineering*, 8(4), 4852-4859. <https://doi.org/10.35940/ijrte.D8062.118419>
- Oraif, I., & Elyas, T. (2021). The impact of COVID-19 on learning: investigating EFL students' engagement in online courses in Saudi Arabia. *Education Sciences*, 11(99), 1-19. <https://doi.org/10.3390/educsci11030099>
- Ormston, R., Spencer, L., Barnard, M., & Snape, D. (2014). The foundations of qualitative research. In J. Ritchie, J. Lewis, C. Nicholls & R. Ormston (Eds.), *Qualitative Research Practice: A Guide for Social Science Students and Researchers* (pp. 1-25). Los Angeles: Sage.
- Oswal, S. K., & Meloncon, L. (2014). Paying Attention to Accessibility When Designing Online Courses in Technical and Professional Communication. *Journal of Business and Technical Communication*, 28(3) 271-300. Doi:1050651914524780.
- Owen, J., Wasiuk, C., Nokes, A., & Roderick, S. (2021). Developing an online learning community through an open reflective assessment. *Compass: Journal of Learning and Teaching*, 14(3), 1–10. DOI: <https://doi.org/10.21100/compass.v14i3.1217>
- Oyedemi, T. D., & Choung, M. (2020). Digital inequality and youth unemployment. *Communication*, 46(3), 68-86. <https://doi.org/10.1080/02500167.2020.1821738>
- Pacansky-Brock, M. (2017). *Best practices for teaching with emerging technologies* (2nd ed.). New York, NY: Routledge.
- Pallant, J. (2011). *A Step-by-Step Guide to Data Analysis Using the SPSS Program: Survival Manual*, (4th Ed.). Berkshire: McGraw-Hill.
- Panhwar, A. H., Ansari, S., & Shah, A. A. (2017). Post-positivism: an effective paradigm for social and educational research. *International Research Journal Arts & Humanities (IRJAH)*, 45(45), 253-260.
- Paré, G., Trudel, M. C., Jaana, M., & Kitsiou, S. (2015). Synthesizing information systems knowledge: A typology of literature reviews. *Information & Management*, 52(2), 183-199. <https://doi.org/10.1016/j.im.2014.08.008>
- Parker, A. (1999). Interaction in distance education: The critical conversation. *AACE Journal*, 1(12), 13-17. <https://www.learntechlib.org/primary/p/8117/>
- Pascale, C. (2011). *Cartographies of knowledge: Exploring qualitative epistemologies*. Thousand Oaks, CA: Sage.
- Patel, N. M., Kadyamatimba, A., & Madzvamuse, S. (2017). Investigating factors influencing the implementation of e-learning at rural-based universities. *Information Technology Journal*, 16, 101-113.

- Patton, M. Q. (2015). *Qualitative research and evaluation methods: Integrating theory and practice*. (4thed.). Thousand Oaks, CA: Sage.
- Pejić-Bach, M., & Cerpa, N. (2019). Editorial: planning, conducting and communicating systematic literature reviews. *Journal of Theoretical and Applied Electronic Commerce Research*, 14(3), 1-4. <https://doi.org/10.4067/S0718-18762019000300101>
- Pezalla, A., Pettigrew, J., & Miller-day, M. (2012). Researching the researcher-as-instrument: An exercise in interviewer self-reflexivity. *Qualitative Research*, 12, 165-185. <https://doi.org/10.1177/1468794111422107>
- Pham, A. T. V., Kieu, N. V., & Vu, T. T. (2021). Student Support Services in an Online Learning Environment. 5th International Conference on E-Society, E-Education and E-Technology (ICSET 2021). Taipei Taiwan August 21 - 23, 2021. <https://doi.org/10.1145/3485768.3485801>
- Phirangee, K. (2016). Students' perceptions of student-student interactions that weaken a sense of community in an online learning environment. *Online Learning*, 20(4), 13-33. <https://eric.ed.gov/?id=EJ1124630>
- Phirangee, S. K. (2016). Exploring the Role of Community in Online. Unpublished PhD Thesis. Toronto: University of Toronto.
- Pishchukhina, O., & Watson, M. (2021). Tools and techniques to stimulate higher order thinking in online learning. In D. Maga, & J. Hajek (Eds.), Proceedings of 30th Annual Conference of the European Association for Education in Electrical and Information Engineering (EAEEIE-2021), Prague, 1-3 September, 2021 (1 ed., pp. 188-193). (30th Annual Conference of the European Association for Education in Electrical and Information Engineering (EAEEIE 2021): Proceedings). Czech Technical University, Publishing House. <https://doi.org/10.1109/EAEEIE50507.2021.9530851>
- Phoenix, C., Osborne, N., Redshaw, C., Moran, R., Stahl-Timmins, W., Depledge, M., Fleming, L. E., & Wheeler, B. W. (2013). Paradigmatic approaches to studying environment and human health. *Environmental Science and Policy*, 25, 218-228. <https://doi.org/10.1016/j.envsci.2012.10.015>
- Pitt, E., & Norton, L. (2017). 'Now that's the feedback I want!' Students' reactions to feedback on graded work and what they do with it. *Assessment & Evaluation in Higher Education*, 42(4), 499-516. <https://doi.org/10.1080/02602938.2016.1142500>
- Pope, E. M. (2020). From participants to co-researchers: methodological alterations to a qualitative case study. *The Qualitative Report*, 25(10), 3749-3761. <https://doi.org/10.46743/2160-3715/2020.4394>
- Premagowrie, S., Kalai, V. R., & Ree, C. H. (2014). Online forum: a platform that affects students' learning? *American International Journal of Social Science*, 3(7), 107-116. <https://doi.org/10.31686/ijier.vol2.iss11.272>
- Pring, R. (2015). *Philosophy of Educational Research* (third edition). London: Bloomsbury Academic.
- Pritts, N. (2020). Using Announcements to Give Narrative Shape to your Online Course. <https://www.facultyfocus.com/articles/online-education/online-course-design-and-preparation/using-announcements-to-give-narrative-shape-to-your-online-course/>. Date of access: 10 December, 2021.
- Purnomo, A., Septianto, A., Anam, F., Christanti, A., & Zamahsari, G. K. (2021). A Bibliometric Overview and Visualization of the Digital Education Publication. *Information Management and Technology (ICIMTech) 2021 International Conference* 1, 819-824. <https://doi.org/10.1109/ICIMTech53980.2021.9535037>

- Quinlan, C. (2011). *Business Research Methods*. Hampshire: Cengage Learning.
- Quinn, R., & Gray, G. (2020). Prediction of student academic performance using Moodle data from a further education setting. *Irish Journal of Technology Enhanced Learning*, 5(1), 1-19. <https://journal.ilta.ie/index.php/telji/article/view/57>
- Quong, J., Snider, S. L., & Early, J. (2018). Reducing transactional distance in online and blended courses through the use of a closed social media platform. *Journal of Educational Technology Systems*, 47(1), 79–100. <https://eric.ed.gov/?id=EJ1187374>
- Ranieri, M., Raffaghelli, J., & Pezzati, F. (2018). Digital resources for faculty development in e-learning: a self-paced approach for professional learning. *Italian Journal of Educational Technology*, 26(1), 104-118. <https://www.learntechlib.org/p/184092/>
- Rapanta, C., Botturi, L., Goodyear, P., Guardia, L., & Koole, M. (2020). Online university teaching during and after the COVID-19 crisis: Refocusing teacher presence and learning activity. *Postdigital Science and Education*, 2, 923-945. <https://doi.org/10.1007/s42438-020-00155-y>
- Rasmussen, M. L. (2017). The role of theory in research. In D. Wyse, N. Selwyn, E. Smith, & L. E. Suter (Eds.), *The BERA/SAGE Handbook of Educational Research* (1st ed., Vol. 1, pp. 53-71). London: SAGE Publications Ltd.
- Raymundo, M. R. (2020). Fostering creativity through online creative collaborative group projects, *Asian Association of Open Universities Journal*, 15(1), 97-113. <https://doi.org/10.1108/AAOUJ-10-2019-0048>
- Razali, S. N., Ahmad, M. H., & Noor, H. A. M. (2020). Implications of learning interaction in online project-based collaborative learning. *Journal of Computational and Theoretical Nanoscience*, 17(2-3), 681-688. <https://doi.org/10.1166/jctn.2020.8831>
- Regnault, A., Willgoss, T., & Barbic, S. (2018). Towards the use of mixed methods inquiry as best practice in health outcomes research. *Journal of Patient-Reported Outcomes*, 2(19), 1-4. <https://doi.org/10.1186/s41687-018-0043-8>
- Rehman, A. A., & Alharthi, K. (2016). An introduction to research paradigms. *International Journal of Educational Investigations*, 3(8), 51-59. Retrieved from: www.ijeionline.com
- Rengasamy, D. (2016). The role of theory in social science research. *International Conference on Research avenues in Social Science*, 1(3), 120-125. <http://hdl.handle.net/20.500.11937/77225>
- Rhalmi, M. (2010). Practical Teaching Tips for Giving Instructions. Available at: <https://goo.gl/gZvnPe>. Date of Access: 10 December, 2021.
- Richards, K. (2003). *Qualitative inquiry in TESOL*. New York, NY: Palgrave Macmillan. <https://link.springer.com/book/10.1057/9780230505056>
- Richardson, J. C., Besser, E., Koehler, A., Lim, J., & Strait, M. (2016). Instructors' perceptions of instructor presence in online learning environments. *International Review of Research in Open and Distributed Learning*, 17(4), 82-103. <https://doi.org/10.19173/irrodl.v17i4.2330>
- Robinson, K. A., Saldanha, I. J., & McKoy, N. A. (2011). Development of a framework to identify research gaps from systematic reviews. *Journal of Clinical Epidemiology*, 64(12), 1325-1330. <https://doi.org/10.1016/j.jclinepi.2011.06.009>
- Roddy, C., Amiet, D. L., Chung, J., Holt, C., Shaw, L., McKenzie, S., Garivaldis, F., Lodge, J. M., & Mundy, M. E. (2017, November). Applying best practice online

- learning, teaching, and support to intensive online environments: An integrative review. In *Frontiers in Education* (Vol. 2, p. 59). Frontiers Media SA. <https://doi.org/10.3389/feduc.2017.00059>
- Rodriguez-Ardura, I., & Meseguer-Artola, A. (2016). E-learning continuance: The impact of interactivity and the mediating role of imagery, presence and flow. *Information and Management*, 53(4), 504-516. <https://doi.org/10.1016/j.im.2015.11.005>
- Rogers, S. E. (2016). Bridging the 21st-century digital divide. *TechTrends*, 60(3), 197-199. <https://doi.org/10.1007/s11528-016-0057-0>
- Roopa, S., & Rani, M. S. (2012). Questionnaire designing for a survey. *Journal of Indian Orthodontic Society*, 46(4), 273-277. <https://doi.org/10.5005/jp-journals-10021-1104>
- Rotar, O. (2022). Online student support: a framework for embedding support interventions Open Access into the online learning cycle. *Research and Practice in Technology Enhanced Learning*, 16(2), 1-23. <https://doi.org/10.1186/s41039-021-0017804>
- Rowe, F. (2014). What literature review is not: diversity, boundaries and recommendations? *European Journal of Information Systems*, 23(3), 241-255. <https://doi.org/10.1057/ejis.2014.7>
- Rudasill, K. M., Snyder, K. E., Levinson, H., & L. Adelson, J. (2017). Systems view of school climate: a theoretical framework for research. *Educational Psychology Review*, 30(1), 35-60. <https://doi.org/10.1007/s10648-017-9401-y>
- Saadatmand, M., Uhlin, L., Hedberg, M., Åbjörnsson, L., & Kvarnström, M. (2017). Examining students' interaction in an open online course through the community of inquiry framework. *The European Journal of Open and Distance Learning*, 20(1), 61-79. <https://doi.org/10.1515/eorodl-2017-0004>
- SADC. (1997). *SADC Protocol on Education and Training*. Gaborone: SADC. Retrieved from: <https://www.sadc.int/document/protocol-education-training-1997>. 17 March 2022
- SADC. (2012). *The Southern African Development Community (SADC) Regional Open and Distance Learning Policy Framework (2012)*. Gaborone: SADC. Retrieved from: <https://www.sadc.int/>. 17 March 2022
- Sadeghi, M. (2019). A shift from classroom to distance learning: Advantages and limitations. *International Journal of Research in English Education*, 4(1), 80-88. <https://doi.org/10.29252/ijree.4.1.80>
- Saldana, J., & Omasta, M. (2018). *Qualitative research: Analyzing life*. Los Angeles: Sage. https://digitalcommons.usu.edu/theatre_facpub/31/
- Salter, N. P., & Conneely, M. R. (2015). Structured and unstructured discussion forums as tools for student engagement. *Computers in Human Behavior*, 46, 18-25. <https://doi.org/10.1016/j.chb.2014.12.037>
- Saunders, B., Kitzinger, J., & Kitzinger, C. (2015). Anonymising interview data: challenges and compromise in practice. *Qualitative Research*, 15(5), 616-632. <https://doi.org/10.1177/1468794114550439>
- Savci, C., Akinci, A. C., & Keles, F. (2022). The association of perceived sociability and social intelligence with loneliness in online learning among nursing students. *Nurse Education Today*, 109, 1-6. <https://doi.org/10.1016/j.nedt.2021.105226>

- Savela, T. (2018). The advantages and disadvantages of quantitative methods in school scape research. *Linguistics and Education*, 44, 31-44. <https://doi.org/10.1016/j.linged.2017.09.004>
- Savin-Baden, M., & Major, C. H. (2013). *Qualitative Research: The Essential Guide to Theory and Practice*, London: Routledge. http://irep.ntu.ac.uk/32829/1/PubSub10268_Clarke.pdf
- Sandanayake, T. C. (2019). Promoting open educational resources-based blended learning. *International Journal of Educational Technology in Higher Education*, 16(3), 1-16. <https://doi.org/10.1186/s41239-019-0133-6>
- Sawant, S. (2021). Online Collaborative Learning Tools and Types: Their Key Role in Managing Classrooms without Walls. In H. Rahman (Eds.), *Human-Computer Interaction and Technology Integration in Modern Society* (pp. 12-41). IGI Global. <https://doi.org/10.4018/978-1-7998-5849-2.ch002>
- Saykılı, A. (2018). Distance education: definitions, generations, key concepts and future directions. *International Journal of Contemporary Educational Research*, 5(1), 2-17. <https://dergipark.org.tr/en/download/article-file/498240>
- Scager, K., Boonstra, J., Peeters, T., Vulperhorst, J., & Wiegant, F. (2016). Collaborative learning in higher education: evoking positive interdependence. *CBE—Life Sciences Education*, 15(69), 1–9. <https://doi.org/10.1187/cbe.16-07-0219>
- Schreurs, B., Cornelissen, F., & De Laat, M. (2019). How do online learning networks emerge? A review study of self-organizing network effects in the field of networked learning. *Education Sciences*, 9(289), 1-27. <https://doi.org/10.3390/educsci9040289>.
- Seethamraju, R. (2014). Effectiveness of using online discussion forum for case study analysis. *Education Research International*, 1(1), 1-11. <http://dx.doi.org/10.1155/2014/589860>
- Self, S., Fudge, T., & Hall, L. (2018). Online class activities: an empirical study of success factors in the post-secondary curriculum. *International Journal of Education Research*, 13(1), 55-64.
- Sha, B. L. (2018). Editor's essay: Thoughts on theory. *Journal of Public Relations Research*, 30(1-2), 1-4. <https://doi.org/10.1080/1062726X.2018.1472726>
- She, L., Ma, L., Jan, A., Sharif Nia, H., & Rahmatpour, P. (2021). Online learning satisfaction during COVID-19 pandemic among Chinese university students: the serial mediation model. *Frontiers in Psychology*, 12(1), 1–12. <https://doi.org/10.3389/fpsyg.2021.743936>
- Shea, P., & Bidjerano, T. (2012). Learning presence as a moderator in the community of inquiry model. *Computers & Education*, 59(2), 316–326. <https://doi.org/10.1016/j.compedu.2012.01.011>
- Sheridan, K., & Kelly, M. A. (2010). The indicators of instructor presence that are important to students in online courses. *MERLOT Journal of Online Learning and Teaching*. 6(1), 767-779.
- Shi, Y. H., Peng, C. L., Yang, H. H., & Macleod, J. (2018). Examining IWB-based instruction on the academic self-efficacy, academic press and achievement of college students. *Open Learning*, 30, 115–130. <https://doi.org/10.1080/02680513.2018.1454829>
- Sianou-Kyrgiou, E., & Tsiplakides, I. (2012). Digital divide: students' use of the internet and emerging forms of social inequalities. In A. Jimoyiannis (Ed.), *Research on e-learning and ICT in education*, (pp. 55 - 68). New York: Springer. https://doi.org/10.1007/978-1-4614-1083-6_5

- Siemens, G. (2005). Connectivism: A learning theory for the digital age. *International Journal of Instructional Technology and Distance Learning*, 2(1), 3-10.
- Siemens, G., & Downes, S. (2009). Connectivism and connective knowledge. *International Journal of Instructional Technology and Distance Learning*, 2(1), 3-10. <https://edtechbooks.org/connectivism/>
- Silva, S. C., & Durante, P. (2014). Suggestions for international research using electronic surveys. *The Marketing Review*, 14(3), 297-309. DOI:[10.1362/146934714X14024779061992](https://doi.org/10.1362/146934714X14024779061992)
- Simelane-Mnisi, S. (2018). Role and importance of ethics in research. In ensuring research integrity and the ethical management of data (p. 1–13). <https://doi.org/10.4018/978-1-5225-2730-5.ch001>
- Singh, V., & Thurman, A. (2019). How many ways can we define online learning? A systematic literature review of definitions of online learning (1988-2018). *American Journal of Distance Education*, 33(4), 289-306. <https://doi.org/10.1080/08923647.2019.1663082>
- Sobaih, A. E. E., Hasanein, A. M., & Abu Elnasr, A. E. (2020). Responses to COVID-19 in higher education: Social media usage for sustaining formal academic communication in developing countries. *Sustainability*, 12(16), 6520-6537. <https://doi.org/10.3390/su12166520>
- Sogunro, O. A. (2017). Quality instruction as a motivating factor in higher education. *International Journal of Higher Education*, 6(4), 173–184. <https://doi.org/10.5430/ijhe.v6n4p173>
- Song, D., Rice, M., & Oh, E. Y. (2019). Participation in online courses and interaction with a virtual agent. *International Review of Research in Open and Distributed Learning*, 20(1), 43-62. <https://doi.org/10.19173/irrodl.v20i1.3998>
- Stevanovi, A., Boži, R., & Radovi, S. (2021). Higher education students' experiences and opinion about distance learning during the Covid-19 pandemic. *Journal of Computer Assisted Learning*, 37(6), 1682-1699. <https://doi.org/10.1111/jcal.12613>
- Stoliker, B. E., & Lafreniere, K. D. (2015). The influence of perceived stress, loneliness, and learning burnout on university students' educational experience. *College Student Journal*, 49(1), 146 -160. <https://eric.ed.gov/?id=EJ1095547>
- Stone, C., & O'Shea, S. (2019). Older, online and first: recommendations for retention and success. *Australasian Journal of Educational Technology*, 35(1), 57-69. <https://doi.org/10.14742/ajet.3913>
- Stoytcheva, M. (2017). Collaborative Distance Learning: Developing an Online Learning Community. Proceedings of the 43rd International Conference Applications of Mathematics in Engineering and Economics AIP Conference Proceedings. 1910, 060009-1–060009-8. <https://doi.org/10.1063/1.5014003>
- Straub, S., & Rummel, N. (2020). Promoting interaction in online distance education: designing, implementing and supporting collaborative learning Interaction in online distance education. *Information and Learning Sciences*, 121(5/6), 251–260. <https://doi.org/10.1108/ILS-04-2020-0090>
- Suárez-Lantarón, B., Deocano-Ruíz, Y., García-Perales, N., & Castillo-Reche, I.S. (2022). The educational use of WhatsApp. *Sustainability*, 14(1), 1 - 14 10510. <https://doi.org/10.3390/su141710510>
- Sugeng, B., & Suryani, A. W. (2018). Presentation-based learning and peer evaluation to enhance active learning and self-confidence in Financial Management classroom. *Malaysian Journal of Learning and Instruction*, 15(1), 173-201. DOI:[10.32890/mjli2018.15.1.7](https://doi.org/10.32890/mjli2018.15.1.7)

- Sula, G., Haxhihyseni, S., & Noti, K. (2021). Wikis as a tool for co-constructed learning in higher education – An exploratory study in an Albanian higher education. *International Journal of Emerging Technologies in Learning (iJET)*, 16(24), 191-204. <https://doi.org/10.3991/ijet.v16i24.26541>
- Sula, G., & Sulstarova, A. (2022). Using Wikis as a Teaching Tool for Novice Teachers – Pedagogical Implications. *Journal of Learning for Development*, 9(2), 163-175 DOI:[10.56059/jl4d.v9i2.638](https://doi.org/10.56059/jl4d.v9i2.638)
- Su, J., & Waugh, M. L. (2018). Online student persistence or attrition: Observations related to expectations, preferences, and outcomes. *Journal of Interactive Online Learning*, 16(1), 63-79. www.ncolr.org/jiol
- Sung, Y. T., Chang, K. E., & Liu, T. C. (2016). The effects of integrating mobile devices with teaching and learning on students' learning performance: A meta-analysis and research synthesis. *Computers & Education*, 94(1), 252-275. <https://doi.org/10.1016/j.compedu.2015.11.008>
- Suradi, Z., Baqwir, J. A. M., & Yusoff, N. H. (2018). Factors affecting the use of Moodle systems among students in Dhofar University, Proceedings of 130th The IRES International Conference, Taipei, Taiwan, 26th–27th July, 2018.
- Suriyakumari, L. (2016). Promoting collaborative learning among students. *American Journal of Educational Research*, 4(8), 602-607.
- Surma, T., & Kirschner, P. A. (2020). Technology-enhanced distance learning should not forget how learning happens. *Computers in Human Behavior*, 110, 1-2. <https://doi.org/10.1016/j.chb.2020.106390>
- Sürücü, L., & Maslakçı, A. (2020). Validity and reliability in quantitative research, *Business & Management Studies: An International Journal (BMIJ)*, 8(3), 2694-2726. <https://doi.org/10.15295/bmij.v8i3.1540>
- Swan, K., Garrison, D. R., & Richardson, J. (2009). "A constructivist approach to online learning: the Community of Inquiry framework". In C.R. Payne (Ed) *Information technology and constructivism in higher education: Progressive learning frameworks*, (pp 43-57) London: IGI Global. <https://doi.org/10.4018/978-1-60566-654-9.ch004>
- Swanson, E., McCulley, L. V., Osman, D. J., Scammacca Lewis, N., & Solis, M. (2019). The effect of team-based learning on content knowledge: A meta-analysis. *Active Learning in Higher Education*, 20(1), 39–50. <https://doi.org/10.1177/1469787417731201>
- Swart, A. J. (2015). Student usage of a learning management system at an open distance-learning Institute: A case study in electrical engineering, *International Journal of Electrical Engineering Education*, 52(2), 142-154. <http://hdl.handle.net/11462/1473>
- Sweeney, E. M., Beger, A. W., & Reid, L. (2021). Google Jamboard for virtual anatomy education. *The Clinical Teacher*. <https://doi.org/10.1111/tct.13389>
- Sylvestre, E., & Maitre, J. P. (2018). Cohérence pédagogique et approche-programme: les évolutions de la pédagogie universitaire en formation d'orthophonie-logopédie. *Rééducation Orthophonique*, 276(1), 15-30.
- Taber, K. T. (2018). The Use of Cronbach's Alpha When Developing and Reporting Research Instruments in Science Education. *Research in Science Education*, 48(1), 1273-1296. <https://doi.org/10.1007/s11165-016-9602-2>
- Taherdoost, H. (2016). How to design and create an effective survey/questionnaire: a step-by-step guide. *International Journal of Academic Research in*

- Management (IJARM)*, 5(4), 37-41. Available at SSRN: <https://ssrn.com/abstract=3224226>
- Takahashi, A. R. W., & Araujo, L. (2020). Case study research: opening up research opportunities. *RAUSP Management Journal*, 55(1), 100–111. <https://doi.org/10.1108/RAUSP-05-2019-0109>
- Tang, W., Cui, Y., & Babenko, O. (2014). Internal consistency: Do we really know what it is and how to assess it? *Journal of Psychology and Behavioural Science*, 2(2), 205-220. https://jpbsnet.com/journals/jpbs/Vol_2_No_2_June_2014/13.pdf
- Tanlaka, E. F., Ewashen, C., & King-Shier, K. (2019). Postpositivist critical multiplism: Its value for nursing research. *Nursing Open*, 6(1), 740-744. <https://doi.org/10.1002/nop2.306>
- Tashakkori, A., & Creswell, J. W. (2007). The new era of mixed methods. *Journal of Mixed Methods Research*, 1(1), 3-7. <https://jhu.pure.elsevier.com/en/publications/editorial-the-new-era-of-mixed-methods>
- Tavakol, M., & Dennick, R. (2011). Making sense of Cronbach's alpha. *International journal of medical education*, 2(1), 53-55. <https://doi.org/10.5116/ijme.4dfb.8dfd>
- Teddlie, C., & Tashakkori, A. (2010). *Handbook of mixed methods in social and behavioural research* (2nded.). Thousand Oaks, CA: SAGE.
- Terrell, R. S. (2012). Mixed methods research methodologies. *The Qualitative Report*, 17(1), 254-280. <http://www.nova.edu/ssss/QR/QR17-1/terrell.pdf>
- Thoib, I. (2021). Critical collaboration-oriented constructivist learning model development to improve social and spiritual skills. *Journal of Southwest Jiaotong University*, 56(3), 436-445. <https://doi.org/10.35741/issn.0258-2724.56.3.37>
- Thomas, C., Sarma, P. K. A. V., Gajula, S. S., & Jayagopi, D. B. (2022). Automatic prediction of presentation style and student engagement from videos. *Computers and Education: Artificial Intelligence*, 3(1), 1 – 13 <https://doi.org/10.1016/j.caeai.2022.100079>
- Thurmond, V. A. (2003). Examination of interaction variables as predictors of students' satisfaction and willingness to enrol in future Web-based courses while controlling for student characteristics. Published Dissertation. University of Kansas. Parkland, FL: Dissertation.com. Available online: <http://www.dissertation.com/library/1121814a.htm>. <http://www.dissertation.com/library/1121814a>
- Tilak, J. B. G. (2017). *Higher Education, Public Good and Markets* (1st ed.). Routledge India. <https://doi.org/10.4324/9781315146386>. Date of access: 10 March 2022.
- Todorovic, M., Coyne, E., Gopalan, V., Oh, Y., Landowski, L., & Barto, M. (2021). Twelve tips for using Facebook as a learning platform. *Medical Teacher*, 43(11), 1261-1266 <https://doi.org/10.1080/0142159X.2020.1854708>
- Toscu, S. (2023). Exploring classroom interaction in online education. *Education and Information Technologies*, Published online 23 February 2023. <https://doi.org/10.1007/s10639-023-11622-x>
- Turley, C., & Graham, C. (2019). Interaction, student satisfaction, and teacher time investment in online high school courses. *Journal of Online Learning Research*, 5(2), 169-198. <https://www.learntechlib.org/primary/p/209812>
- Udo, G. J., Bagchi, K. K., & Kirs, P. J. (2011). Using SERVQUAL to assess the quality of e-learning experience. *Computers in Human Behaviour*, 27(3), 1272-1283. <https://doi.org/10.1016/j.chb.2011.01.009>

- Ugwu, C. I., Ekere, J. N., & Onoh, C. (2021). Research paradigms and methodological choices in the research process. *Journal of applied Information Science and Technology*, 14(2), 116-124.
- Ulla, M. B., & Perales, W. F. (2021). Facebook as an integrated online learning support application during the COVID-19 pandemic: Thai university students' experiences and perspectives. *Heliyon*, 7(1), 1 – 8.
<https://doi.org/10.1016/j.heliyon.2021.e08317>
- University of Eswatini (2018). *University of Eswatini Teaching, Learning and Assessment Policy*. (Unpublished) Kwaluseni: UNESWA
- University of Eswatini (2020). *University of Eswatini Blended Learning Policy*. (unpublished) Kwaluseni: UNESWA
- University of South Africa (2010). *Task Team 4: Student Support, enabling discussion classes at UNISA through satellite broadcasting and video conferencing*. Pretoria: UNISA Press.
<https://uir.unisa.ac.za/bitstream/handle/10500/3293/ODL%20Task%20team%204%20-%20Video%20Submitted.pdf;sequence=1>
- Usher, M., & Barak, M. (2020). Team diversity as a predictor of innovation in team projects of face-to-face and online students. *Computers & Education*, 144, 1-14. <https://doi.org/10.1016/j.compedu.2019.103702>
- Utecht, J., & Keller, D. (2019). Becoming relevant again: applying Connectivism learning theory to today's classrooms. *Critical Questions in Education*, 10(2), 107-119.
- Vaismoradi, M., & Snelgrove, S. (2019). Theme in qualitative content analysis and thematic analysis. *Forum Qualitative Sozialforschung / Forum: Qualitative Social Research*, 20(3), 1-14 <https://doi.org/10.17169/fqs-20.3.3376>
- Van den Berg, G. (2012). Students' perceptions of the role of lecturers in online discussions. *Progressio*, 34(1), 71-85.
<https://hdl.handle.net/10520/EJC130267>
- Van den Berg, G. (2020). Context matters: student experiences of interaction in Open Distance Learning. *Turkish Online Journal of Distance Education-TOJDE*, 21(4), 223-235. <https://doi.org/10.17718/tojde.803411>
- Van den Berg, G., & Mudau, P. K. (2022). Postgraduate students' views on the use of WhatsApp groups as an online communication tool to support teaching and learning during COVID-19. *Perspectives in Education*, 40(1), 112-128.
<https://doi.org/10.18820/2519593X/pie.v40.i1.7>
- Van Deursen, A.J., & Van Dijk, J.A. (2019). The first-level digital divide shifts from inequalities in physical access to inequalities in material access. *New Media Society*, 21(2), 354–375. <https://doi.org/10.1177/1461444818797082>
- Van Wart, M., Ni, A., Medina, P., Canelon, J., Kordrostami, M., Zhang, J., & Liu, Y. (2020). Integrating students' perspectives about online learning: a hierarchy of factors. *International Journal of Educational Technology in Higher Education*, 17(53), 1 – 22. <https://doi.org/10.1186/s41239-020-00229-8>
- Veletsianos, G. (2010). *Emerging technologies in distance education*. Alberta, Canada: Athabasca University.
- Venkatesh, V., & Sykes, T. A. (2013). Digital divide initiative success in developing countries: a longitudinal field study in a village in India. *Information Systems Research*, 24(2), 239-260. <https://doi.org/10.1287/isre.1110.0409>

- Verbeeck, M. (2016). 'There is nothing more practical than a good theory': conceptual tools for conservation practice. *Studies in Conservation*, 61(2), 233-240. <https://doi.org/10.1080/00393630.2016.1188647>
- Verhagen, P. (2006). Connectivism: A new learning theory? Surf e-learning themasite, <http://elearning.surf.nl/e-learning/english/3793>
- Vu, P., & Fadde, P. J. (2015). When to talk, when to chat: Student interactions in live virtual classrooms. *Journal of Interactive Online Learning*, 12(2), 41-52. <https://core.ac.uk/download/pdf/30676070.pdf>
- Wagner, E. D. (1994). In support of a functional definition of interaction. *The American Journal of Distance Education*, 8(2), 6-29. <https://www.tandfonline.com/doi/abs/10.1080/08923649409526852>
- Waismann, F. (2011). Causality and logical positivism. In Humanities, Social Science and Law. Resource Type: Springer eBooks. https://scholar.google.com/scholar?hl=en&as_sdt=0%2C5&q=Waismann%2C+F.+%282011%29.+Causality+and+logical+positivism.+In+Humanities%2C+S+ocial+Science+and+Law.+Resource+Type%3A+Springer+eBooks.&btnG=
- Walisundara, W. M. (2017). A review of the literature on Community of Inquiry model. *European Journal of Computer Science and Information Technology*, 5(6), 45-49
- Walliman, N. (2018). *Research Methods: The Basics*. London: Routledge. <https://doi.org/10.4324/9781315529011>
- Wa-Mbaleka, S. (2020). The Researcher as an Instrument. In: Costa, A., Reis, L., Moreira, A. (eds) Computer Supported Qualitative Research. WCQR 2019. Advances in Intelligent Systems and Computing, Vol 1068. Springer, Cham. https://doi.org/10.1007/978-3-030-31787-4_3
- Watson, C. (2005). Living the life of the social inquirer: Beginning educational research. *Forum Qualitative Sozialforschung/Forum: Qualitative Social Research*, 6(2), 1-20. <https://doi.org/10.17169/fqs-6.2.471>
- Watson, F., Castano, B., & Ferdinand-James, D. (2017). Instructional strategies to help online students learn: feedback from online students. *TechTrends*, 61(1), 420-427. <https://doi.org/10.1007/s11528-017-0216-y>
- Watts, L. (2016). Synchronous and asynchronous communication in distance learning: A review of the literature. *The Quarterly Review of Distance Education*, 17(1), 23-32. <https://eric.ed.gov/?id=EJ1142962>
- Waugh, M., & Su-Searle, J. (2014). Student persistence and attrition in an online MS program: Implications for program design. *International Journal on E-Learning*, 13(1), 101-121. <https://www.learntechlib.org/primary/p/38649/>
- Webster, J., & Watson, R. T. (2002). Analyzing the past to prepare for the future: Writing a Literature Review, *MIS Quarterly*, 26(2), xiii–xxiii. <https://www.jstor.org/stable/4132319>
- Wedlock, B. C., & Gowe, R. (2017). The technology-driven student: how to apply Bloom's revised taxonomy to the digital generations, *Journal of Education and Social Policy*, 7(1), 25-34.
- Wehmeyer, M., & Zhao, Y. (2020). *Teaching Students to Become Self-Determined Students*. Alexandria, VA: ASCD.
- Weidlich, J., & Bastiaens, T. J. (2019). Designing sociable online learning environments and enhancing social presence: An affordance enrichment approach. *Computer & Education*, 142, 1–17. <https://doi.org/10.1016/j.compedu.2019.103622>

- West, R. E., & Williams, G. S. (2017). "I don't think that word means what you think it means": A proposed framework for defining learning communities. *Educational Technology Research and Development*, 65(6), 1569–1582. <https://doi.org/10.1007/s11423-017-9535-0>
- Whiston, S. (2012). *Principles and Applications of Assessment in Counseling*. Boston, MA: Cengage Learning.
- White, L. J., McGowan, H. W., & McDonald, A. C. (2018). The Effect of Content Delivery Style on Student Performance in Anatomy. *Anatomical Sciences Education*, 12(1), 43–51. <https://doi.org/10.1002/ase.1787>
- Whittle, C., Tiwari, S., Yan, S., & Williams, J. (2020). Emergency remote teaching environment: a conceptual framework for responsive online teaching in crises. *Information and Learning Sciences*, 121(5/6), 311–319. <https://doi.org/10.1108/ils-04-2020-0099>
- Wickramanayake, L., & Muhammad, J. S. (2018). Social media use by undergraduate students of education in Nigeria: a survey. *The Electronic Library*, 36(1), 21–37. <https://doi.org/10.1108/el-01-2017-0023>
- Wildman, J. L., Nguyen, D. M., Duong, N. S., & Warren, C. (2021). Student teamwork during COVID-19: Challenges, changes, and consequences. *Small Group Research*, 52(2), 119–134. <https://doi.org/10.1177/1046496420985185>
- Wiles, R., Crow, G., Heath, S., & Charles, V. (2008). The Management of Confidentiality and Anonymity in Social Research. *International Journal of Social Research Methodology*, 11(5), 417- 428. <https://doi.org/10.1080/13645570701622231>
- Williams, R. T. (2020). The Paradigm Wars: Is MMR Really a Solution? *American Journal of Trade and Policy*, 7(3), 79-84. <https://doi.org/10.18034/ajtp.v7i3.507>
- Winchester, C. L., & Salji, M. (2016). Writing a literature review. *Journal of Clinical Urology*, 9(5), 308-312. <https://doi.org/10.1177/2051415816650133>
- World Bank. (2017). *Higher Education for Development: An Evaluation of the World Bank Group's Support*. Washington, DC: World Bank. <https://ieg.worldbankgroup.org/evaluations/higher-education-for-development>
- World Health Organization. (2011). *Standards and Operational Guidance for Ethics Review of Health-Related Research with Human Participants*. Geneva: WHO Press. <https://www.who.int/publications-detail-redirect/9789241502948>
- Wu, X., He, Z., Li, M., Han, Z., & Huang, C. (2022). Identifying Students' Interaction Patterns in an Online Learning Community. *International Journal of Environmental Research in Public Health*, 19(2245), 1 - 22. <https://doi.org/10.3390/ijerph19042245>
- Wut, T., & Xu, J. (2021). Person-to-person interactions in online classroom settings under the impact of COVID-19: A social presence theory perspective. *Asia Pacific Education Review*, 22(1), 371 - 383. <https://doi.org/10.1007/s12564-021-09673-1>
- Wyszomirska, R. M., Pennaforte, R., de Barros Costa, F., Warren, E., & Quintas-Mendes, A. (2021). Team-Based learning: A promising strategy for use in online distance education. *Creative Education*, 12(1), 278-292. <https://doi.org/10.4236/ce.2021.121020>
- Xu, A., Baysari, M. T., Stocker, S. L., Leow, L. J., Day, R. O., & Carland, J. E. (2020). Researchers' views on, and experiences with, the requirement to obtain informed consent in research involving human participants: a qualitative study. *BMC Medical Ethics*, 21(93), 1-11. <https://doi.org/10.1186/s12910-020-00538-7>

- Xu, M. A., & Storr, G. B. (2012). Learning the concept of researcher as instrument in qualitative research. *The Qualitative Report*, 17(42), 1-18. <http://www.nova.edu/ssss/QR/QR17/storr.pdf>
- Yanchenko, K. (2019). Community, network or both? Towards a holistic approach to studying online social structures. *Communication & Language at Work*, 6(2), 15 - 27. <https://tidsskrift.dk/claw/article/view/116081>
- Yang, D. (2017). Instructional strategies and course design for teaching statistics online: perspectives from online students. *International Journal of Stem Education*, 4(34), 1 – 15. <https://doi.org/10.1186/s40594-017-0096-x>
- Yilmaz, K. (2013). Comparison of quantitative and qualitative research traditions: Epistemological, theoretical, and methodological differences. *European Journal of Education*, 48(2), 311-325. <https://doi.org/10.1111/eed.12014>
- Yin, R. K. (2013). *Qualitative Research from start to finish*. New York: Guilford Press Publications. <https://onlinelibrary.wiley.com/doi/abs/10.1111/fcsr.12144>
- You, J. (2016). Identifying significant indicators using LMS data to predict course achievement in online learning. *Internet & Higher Education*, 29(1), 23-30. <https://doi.org/10.1016/j.iheduc.2015.11.003>
- Young, T. J. (2016). Questionnaires and surveys. In Zhu Hua, Ed. *Research Methods in Intercultural Communication: A Practical Guide* (pp.165-180). Oxford: Wiley
- Youngshin, S., Youn-Jung, S., & Doonam, O. (2015). Methodological issues in questionnaire design. *Journal of Korean Academy of Nursing*, 45(3), 323–328. <https://doi.org/10.4040/jkan.2015.45.3.323>
- Yu, J., Huang, C., Han, Z., He, T., & Li, M. (2020). Investigating the influence of interaction on learning persistence in online settings: Moderation or mediation of academic emotions? *International Journal of Environmental Research in Public Health*, 17(2320), 1-21. <https://doi.org/10.3390/ijerph17072320>
- Yunusa, A. A., & Umar, I. N. (2021). A scoping review of critical predictive factors (CPFs) of satisfaction and perceived learning outcomes in E-learning environments. *Education and Information Technologies*, 26(1), 1223-1270. <https://doi.org/10.1007/s10639-020-10286-1>
- Zaidi, Z., & Larsen, D. (2018). Commentary: Paradigms, axiology, and praxeology in medical education research. *Academic Medicine*, 93(11S), S1-S7. <https://doi.org/10.1097/ACM.0000000000002384>
- Zalat, M. M., Hamed, M. S., & Bolbol, S.A. (2021). The experiences, challenges, and acceptance of elearning as a tool for teaching during the COVID-19 pandemic among university medical staff. *PLoS ONE*, 16(3), 1-12. <https://doi.org/10.1371/journal.pone.0248758>
- Zhao, Y., & Watterston, J. (2021). The changes we need: Education post-COVID-19. *Journal of Educational Change*, 22(1), 3-12. <https://doi.org/10.1007/s10833-021-09417-3>
- Zhu, X., & Liu, J. (2020). Education in and after Covid-19: Immediate responses and long-term visions. *Post-digital Science and Education*, 2(3), 695-699. <https://doi.org/10.1007/s42438-020-00126-3>
- Zou, Y., Schunn, C. D., Wang, Y., & Zhang, F. (2018). Student attitudes that predict participation in peer assessment. *Assessment & Evaluation in Higher Education*, 43(5), 800- 811. <https://doi.org/10.1080/02602938.2017.1409872>
- Zulfikara, A. F., Muhidin, A., Suparta, W., Trisetyarso, A., Abbasa, B. S., & Kang, C. H. (2019). The Effectiveness of Online Learning with Facilitation Method. *Procedia Computer Science*, 161(1), 32 – 40. [doi10.1016/j.procs.2019.11.096](https://doi.org/10.1016/j.procs.2019.11.096)

- Zuhairi, A., Karthikeyan, N., & Priyadarshana, S. T. (2020). Supporting students to succeed in open and distance learning in the Open University of Sri Lanka and Universitas Terbuka Indonesia. *Asian Association of Open Universities Journal*, 15(1), 13-35. <https://doi.org/10.1108/AAOUJ-09-2019-0038>
- Zuheir, K., Hamid, N., & Kyungbin, K. (2017). Types of interaction in online discussion forums: A case study. *Journal of Educational Issues*, 3(1), 155-159. <https://doi.org/10.5296/jei.v3i1.10975>

APPENDIX A - LETTER TO THE REGISTRAR

Cosmas Maphosa
Institute of Distance Education
University of Eswatini

5 August 2022

The Registrar
University of Eswatini
Private Bag 4
Kwaluseni
M201

Dear Sir

Re: Request for permission to conduct a study on the online interaction experiences of distance education students at the University of Eswatini

I hereby request permission to conduct study titled: "Distance Education Students' Experiences of Online Interaction at a Rural University". The study is conducted to fulfill the requirements for a PhD in Open and Distance e-Learning with the University of South Africa.

The study seeks to gather students' views on the nature, extent and benefits of their interaction in online learning. The specific objectives of this inquiry are to:

1. To ascertain students' understanding of interaction in online learning.
2. To establish the benefits students' derive from interaction in online learning.
3. To find out how students are trained and supported for interaction in online learning.
4. To identify factors that promote or hinder interaction in online learning at the rural university.
5. To assess the implications for online pedagogy at the rural university.

A stratified random sample of 355 distance education students shall respond to an online survey. Forty other students shall participate in virtual Focus Group Discussion. The identity of the respondents and participants shall be protected. Participation in the study shall be voluntary.

I have attached the ethical clearance certificates issued by UNESWA and UNISA.

Thanking you advance for your cooperation.

Yours Sincerely,



Cosmas Maphosa
76322340 (cell)
Email: maphosacos@yahoo.com

APPENDIX B - PERMISSION LETTER FROM UNESWA REGISTRAR



UNIVERSITY OF ESWATINI

Private Bag No 4, Kwaluseni M201, Eswatini
Tel: (+268) 2517 0000 Ext 70108 Fax: (+268) 2517 0001
E-Mail: simelanes@uniswa.sz; registrar@uniswa.sz
Website: www.uniswa.sz

REGISTRAR'S OFFICE

9th August, 2022

Prof. C. Maphosa
Institute of Distance Education
University of Eswatini

Dear Prof. Maphosa

**RE: REQUEST FOR PERMISSION TO CONDUCT AN EVALUATION OF THE ONLINE
INTERACTION EXPERIENCES OF DISTANCE EDUCATION STUDENTS AT THE UNIVERSITY
OF ESWATINI**

Reference is made to your letter of the 5th August, 2022.

You are hereby granted permission to conduct data collection for your study at the University.
In this regard, we wish you all the best in your academic pursuit.

Yours sincerely

A handwritten signature in black ink, appearing to be 'S.S. Simelane'.

Dr. S.S. Simelane
REGISTRAR

APPENDIX C - UNISA ETHICAL CLEARANCE CERTIFICATE



UNISA COLLEGE OF EDUCATION ETHICS REVIEW COMMITTEE

Date: 2022/06/08

Ref: **2022/06/08/10453083/07/AM**

Dear Dr C Maphosa

Name: Dr C Maphosa

Student No.: 10453083

Decision: Ethics Approval from
2022/06/08 to 2027/06/08

Researcher(s): Name: Dr C Maphosa
E-mail address: maphosacos@yahoo.com
Telephone: +268 7632 2340

Supervisor(s): Name: Prof G. Van den Berg
E-mail address: vdberg@unisa.ac.za
Telephone: 012 429 4895

Title of research:

DISTANCE EDUCATION STUDENTS' EXPERIENCES OF ONLINE INTERACTION AT A RURAL UNIVERSITY

Qualification: PhD Open Distance Learning

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 2022/06/08 to 2027/06/08.

*The **medium risk** application was reviewed by the Ethics Review Committee on 2022/06/08 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 will ensure that the research project adheres to the relevant guidelines set out in the Unisa Covid-19 position statement on research ethics attached.
2. 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

3. 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.
4. The researcher(s) will conduct the study according to the methods and procedures set out in the approved application.
5. 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.
6. 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.
7. 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.
8. No field work activities may continue after the expiry date **2027/06/08**. Submission of a completed research ethics progress report will constitute an application for renewal of Ethics Research Committee approval.

Note:

*The reference number **2022/06/08/10453083/07/AM** 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 Mpine Makoe
ACTING EXECUTIVE DEAN
qakisme@unisa.ac.za



Approved - decision template – updated 16 Feb 2017

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APPENDIX D - UNESWA ETHICAL CLEARANCE CERTIFICATE



UNIVERSITY OF ESWATINI

NOTICE OF APPROVAL

Human Subjects Research Ethics Committee (HSREC)

Date: 5 August 2022
HSREC Ref. No.: 2022-HSREC-003-FR
Type of Application: Full Review (FR)
Project Title: Distance Education Students' Experiences of Online Interaction at a Rural University

Dear Prof. Cosmas Maphosa,

Your Initial Application Forms for a Full Review of protection of human research participants in your study submitted on 20 June 2022 was reviewed and **approved** by the REC: Human Subjects Research Ethics Committee.

Please note below expiration date of this approved submission:

Protocol approval date	Protocol expiration date
05 August 2022	05 August 2023

Investigator responsibilities

Please take note of the General Investigator Responsibilities attached to this letter. You may commence with your research after complying fully with these guidelines.

If the researcher deviates in any way from the proposal approved by the HSREC, the researcher must notify the REC of these changes.

Please use the HSREC Register Number, 2022-HSREC-003-FR, on any documents or correspondence with the HSREC concerning your project.

Please note that the HSREC has the prerogative and authority to ask further questions, seek additional information, require further modifications, or monitor the conduct of your research and the consent process. *In this regard, the HSREC notes that you attached a letter of request to the Registrar seeking permission to undertake the study, kindly share the letter of approval, once granted, with the HSREC.*

Continuation of projects after HSREC approval period

You are required to submit a progress report to the HSREC before the approval period has expired if a continuation of ethics approval is required. The Committee will then consider the continuation of the project for a further year (if necessary).

Once you have completed your research, you are required to submit a final report to the HSREC for notification and review.

Included documents

Identity	File name	Date	Version
HSREC FORM 01	Application for ethics approval of confidential research involving human responses/participants	01.08.2022	1
HSREC FORM 02	Description of research dealing with human subjects	01.08.2022	1
HSREC FORM 03	Personal declaration of responsibility for human subjects research	01.08.2022	1
Comments	Final Response to Ethics Committee Comments 2022-HSREC-003-FR July 23 2022	01.08.2022	1
Research Project Documents	Resubmission Request Letter HSREC Ref No. 2022-HSREC-003-FR Appendix 1 Letter to participants Appendix 1b Letter to respondents Appendix 2 Electronic Consent Form Appendix 3 UNISA Ethical Clearance Certificate Appendix 4 Consent Form FGD Appendix 5 Proof of registration PhD Year 2022 Appendix 6 Permission letter to the Registrar	01.08.2022	1 1 1 1 1 1 1 1

If you have any questions or need further help, please contact the UNESWA Research Centre at research@uniswa.sz

Sincerely,



Prof. H. R. Mloza Banda

Director, UNESWA Research Centre

APPENDIX E – STRUCTURED QUESTIONNAIRE

DISTANCE EDUCATION STUDENTS' EXPERIENCES OF ONLINE INTERACTION QUESTIONNAIRE (DESEOIQ)

Dear Respondent

The purpose of this questionnaire is to gather information about DISTANCE EDUCATION STUDENTS' ONLINE INTERACTION EXPERIENCES AT A RURAL-BASED UNIVERSITY IN ESWATINI. Your cooperation is critical to the success of the data obtained from this survey. Your response will be used for research purposes only.

Thanks for taking the time to help us by completing this form.

Introduction

Informed Consent Statement

I do hereby give my consent to participate in the research study entitled: DISTANCE EDUCATION STUDENTS' ONLINE INTERACTION EXPERIENCES OF AT A RURAL-BASED UNIVERSITY IN ESWATINI.

I understand that my participation is voluntary and I can withdraw at any time I no longer feel comfortable continuing.

I understand that the information I provide will be solely used for research purposes. I accept that the information will be kept private and confidential and that my identity will not be revealed.

Electronic Consent

By selecting the 'agree' option below, you agree that:

- You have read the above information
- You voluntarily agree to participate

If you do not wish to participate in the research study, please decline participation by selecting the 'disagree' option.

- Agree
- Disagree

SECTION A

Personal Information

Please, put a tick (✓) in the appropriate box.

Gender	Male	Female	Other			
Age (years)	18 - 22	23 - 27	28 - 32	33 - 37	38 and above	
Programme of Study	B.A. Humanities	B.Ed Adult Education	B.Ed Primary	B.Ed Secondary	LLB	Bachelor of Commerce
	Diploma in Law	Bachelor of Nursing Science	PGCE	BSc in Information Technology	Certificate in Psychosocial Support	Certificate in Portuguese
Level of Study	1 st year	2 nd year	3 rd year	4 th year	5 th year	6 th year

SECTION B

1. Students' understanding of interaction in online learning

Kindly indicate the extent to which you agree or disagree with the following statements of your understanding regarding online interaction/engagement.

(Please, put a tick (✓) in the appropriate box, SA – Strongly Agree; A – Agree; D – Disagree; SD – Strongly Disagree)

Statement	SA	A	D	SD
Interaction is about how I work with others in doing common tasks online				
Interaction entails communicating with other students				
Interaction entails forming of an online learning community				
Interaction is about exchanging learning resources with other students				
Interaction is about communicating with the course instructor				
Interaction is about how I access my course content				
Interaction is about how I get involved in learning the course content				
Interaction is about how I am able to move around within the Moodle Learning Management System				
Interaction is about how I can use my device effectively for online learning				
Interaction is about getting assistance from the course instructor in the learning process				

2. Benefits students derive from interaction in online learning

Kindly indicate the extent to which you agree or disagree with the following statements about advantages you have experienced from online interaction in online learning

(Please, put a tick (✓) in the appropriate box SA – Strongly Agree; A – Agree; D – Disagree; SD – Strongly Disagree)

Benefits you derive from online interaction	SA	A	D	SD
I am able to learn from other students				
I work together with others in performing online tasks				
I feel supported by other students				
I feel supported by my course instructor				
I make the best use of the Moodle LMS				
I make the best use of the function of my device for learning				
I get the necessary guidance, thus information for the course content/subject				
Course expectations are communicated by the course instructor				
The use of a live lesson via video conferencing, such as Zoom, improves participation.				
I obtain useful feedback from assessments				

3. Training and support of students for interaction in online learning

Indicate the extent to which you have received online interaction training and support.

(Please, put a tick (✓) in the appropriate box SA – Strongly Agree; A – Agree; D – Disagree; SD – Strongly Disagree)

Statement	SA	A	D	SD
I have been trained in the general use of the Moodle LMS				
I have been trained on the use of interactive features of the LMS such as the discussion forum				
I have been trained in interactive plug-in features such as Jamboard				
I have been trained in the use of social media for learning				
I have been trained in the use of free educational resources known as OERs				
I have received support when facing technical challenges online				
I have been supported when seeking clarity on course content				
I have been supported when seeking clarity on assessment tasks				
I have been supported in working in an online group				
I have been supported in accessing relevant learning material				

4. Factors that promote or hinder interaction in online learning

Please indicate how much you agree or disagree with the following statements regarding your online learning interaction experience.

(Please, put a tick (✓) in the appropriate box SA – Strongly Agree; A – Agree; D – Disagree; SD – Strongly Disagree)

Statement	SA	A	D	SD
Course facilitators/instructors are always available to support me				
Course content is clearly structured with clear expectations				
Other students are always willing to work with me collaboratively				
Course facilitators/instructors provide opportunities for collaborative learning.				
I have the appropriate devices/gadgets necessary for online learning.				
There is reliable internet connectivity				
I am self-motivated to learn from other students				
Other students exhibit individualistic tendencies				
Students look down upon each other				
There are delays in the provision of immediate feedback				

There is a lack of support from course facilitators/instructors				
Students incur huge data costs for online activities				
I lack appropriate technological skills among				
There are differences in terms of the levels the course facilitators/instructors engage students online				

5. Implications for online pedagogy

Please indicate the frequency to which your course facilitators/instructors used the following methods of online teaching during online learning and teaching sessions

(Please, put a tick (✓) in the appropriate box; Always, Sometimes, Never)

During online learning and teaching sessions, my course facilitators/instructors used ...	Always	Sometimes	Never
Discussion forum			
Wikis			
Collaborative problem-solving activities			
Group tasks on WhatsApp			
Group tasks on Facebook			
Research and presentation			
Collaborative creation of artefacts			
Online Group assignments			
Group projects			
Group practical activities			
Live lessons on video conferencing platforms such as Zoom			

APPENDIX F – FOCUS GROUP DISCUSSION SCHEDULE

DISTANCE EDUCATION STUDENTS’ EXPERIENCES OF ONLINE INTERACTION FOCUS GROUP DISCUSSION SCHEDULE (DESEOIFGDS)

Dear Participant

The purpose of the virtual discussion is to gather information about DISTANCE EDUCATION STUDENTS’ EXPERIENCES OF ONLINE INTERACTION AT A RURAL-BASED UNIVERSITY IN ESWATINI.

The success of the data information obtained is dependent on your full co-operation. Be assured that your responses will be kept confidential and used for research purposes only.

Thanks for your co-operation

SECTION A: DEMOGRAPHIC DATA

- Gender.....
- What is your age?
- How long have you been studying online?
- How long have you been with the Institute of Distance Education (IDE), at UNESWA?
- What programme are you currently enrolled in at IDE?

STUDY GUIDING RESEARCH QUESTIONS	SEMI-STRUCTURED INTERVIEW QUESTIONS
1. How do students understand online learning interaction?	<ul style="list-style-type: none">• What do you think ‘interaction’ and or ‘engagement’ in online learning means?• [Probes: How do you communicate with others in online learning as an individual?• What are the indicators that online learning is interactive?• How do you interact with your lecturers online in the course?• How do you interact with your fellow students online in the course?• In your opinion is sharing of learning resources online an element of interaction?

	<ul style="list-style-type: none"> • Do you think one's ability to use the Moodle LMS is understood as interaction in online learning? Explain • Could one's ability to use technological devices be understood as interaction in online learning? Explain
<p>2. What are the benefits that students derive from online learning interaction?</p>	<ul style="list-style-type: none"> • Reflect on your experiences of interaction with others in online learning and explain how you have benefitted from the interactions. [Probe to ascertain benefits from the following types of interactions; <ul style="list-style-type: none"> - interacting with the course instructors - interacting with fellow students (peers) - interacting with content - interacting with features of the LMS - interacting by utilising devices/gadgets used as learning tools - interacting on social media platforms] • if at all, how has online interaction improved your learning?
<p>3. How are students trained and supported for online learning interaction?</p>	<ul style="list-style-type: none"> • Have you ever received training on the general basic use of computers? If so, describe in detail the type and content of the training in more detail? What was the training's effectiveness? • Have you received any training on how to use the LMS Moodle? If so, describe in detail the type and content of the training? How effective was the training? (Probe) • Have you received any training on the use of WhatsApp or Facebook for learning? • How comfortable are you with using the LMS Moodle, especially with features that require you to interact with others such as; discussion forums and wikis (Probe) • Do you receive any support when you face technical challenges online? (Probe) • What sort of support do you receive in the use of the Moodle LMS, if at all? If you encounter problems with using the named LMS, is assistance readily available? Explain.
<p>4. What factors at the rural-based university that promote or hinder interaction in online learning?</p>	<ul style="list-style-type: none"> • What elements have influenced your online learning interactions? Explain how. <ul style="list-style-type: none"> - [Probe for the following factors: Instructor online support - Clarity of course expectations

	<ul style="list-style-type: none"> - Willingness of other students to work collaboratively with you - Availability and access to appropriate gadgets e.g. laptops, tablet - Availability of data and internet connectivity - Individualistic tendencies by some students - Learning styles of students (e.g. visual, audio, reading text). - Availability of course instructors for online support - Provision of feedback by course facilitators/instructors - Any other factors
<p>5. What are the implications/influence for online pedagogy at the rural university/IDE?</p>	<p>What are the most common teaching and learning approaches used by the course instructors which in your view promote online interaction?</p> <ul style="list-style-type: none"> - Discussion forums (E.g. Moodle LMS) - Wikis - use of social media (provide examples e.g. Twitter, Facebook, Instagram etc) for learning - team-based learning - small group activities - problem-solving approaches - Group projects/assignments - Group practical activities - Peer review and evaluation/assessment - Research and presentation. - Collaborative creation of artefacts or digital products - any other

APPENDIX G: CONSENT FORM FOR FOCUS GROUP DISCUSSION PARTICIPATION

RESEARCH TITLE: DISTANCE EDUCATION STUDENTS' EXPERIENCES OF ONLINE INTERACTION AT A RURAL-BASED UNIVERSITY IN ESWATINI.

Researcher: Cosmas Maphosa

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

I have had explained to me and understood the study as explained by the interviewers. I have had sufficient opportunity to ask questions and am prepared to participate in the study.

I understand that my participation is voluntary and that I am free to withdraw at any time without penalty (if applicable).

I am aware that the findings of this study will be processed into a research report, journal publications and/or conference proceedings, but that my participation will be kept confidential unless otherwise specified.

I agree to the recording of the interviews using an audio recorder. I have received a signed copy of the informed consent agreement.

Participant Name & Surname (please print)

Participant Signature.....

Date.....

Researcher's signature

Date:.....

APPENDIX H: LANGUAGE EDITING CERTIFICATE



Dr Jabulani Sibanda
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10 August 2023

RE: CERTIFICATE OF LANGUAGE EDITING

To whom it may concern

I hereby confirm that I have proofread and edited the following **Thesis** using Windows 'Tracking' System to reflect my comments and suggested corrections for the author(s) to action:

DISTANCE EDUCATION STUDENTS' EXPERIENCES OF ONLINE INTERACTION AT A RURAL-BASED UNIVERSITY

REFERENCE

Author(s): Cosmas Maphosa
Student No: 10453083
Affiliation: University of South Africa

Although the greatest care was taken in the editing of this document, the final responsibility for the product rests with the author(s).

Sincerely

10.08.2023

SIGNATURE

This certificate confirms the language editing I have done in my personal capacity and not on behalf of SPU

APPENDIX I: TURNITIN REPORT – SIMILARITY INDEX CHECK

Second Draft Complete thesis Cosmas

ORIGINALITY REPORT

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SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

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