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UNIVERSITY OF THE WITWATERSRAND
FACULTY OF HUMANITIES SCHOOL OF EDUCATION

RESEARCH REPORT 2021

DEGREE OF MASTER OF EDUCATION IN EDUCATIONAL TECHNOLOGY

TOPIC: ONLINE LEARNING INSTRUCTIONAL DESIGN FACILITATING PARTICIPATION, ENGAGEMENT, AND INTERACTION AT A HIGHER EDUCATIONAL INSTITUTION IN SOUTH AFRICA

BY:

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A RESEARCH REPORT SUBMITTED TO THE FACULTY OF HUMANITIES, UNIVERSITY OF THE WITWATERSRAND, IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF EDUCATION (IN THE FIELD OF EDUCATIONAL TECHNOLOGY)

Dedication

First and foremost I would like to dedicate this work to the Almighty for giving me the knowledge and ability to accomplish this research study and my family for the support they have given me up to this far.

Acknowledgement

I would like to pass my sincere gratitude to Wits School of Education, and Educational Information and Technology Division, as a platform for my learning, my supervisor Dr. Nokulunga Sithabile Ndlovu for her assistance throughout the entire research project process, my colleagues for the moral support they gave me.

Declaration

I, Thabiso Rantoana Ivan Monyau declare that this research report is my own work that presents what I did for my research study and I assure that it has never been submitted to any institution of higher learning for the award of any qualification.

Signature:  Date: 14/03/2022

Abstract

Online learning is now a practical alternative to traditional methods of instruction for access to education. This mode of instructional delivery comes with adaptations in both teaching and learning, and it demands stable access to digital resources and technological skills. Universities in developing countries like South Africa are still striving to adopt and adapt to new ways of providing education due to lack of capacity and shortage of Information and Communication Technology (ICT) infrastructure.

This study aimed to investigate what informs the online learning instructional design of two online courses offered in a South African university to facilitate students' and facilitators' Participation, Engagement, and Interaction (PEI). The inductive approach was used to collect and analyse data for this study that adopted case-study research strategy. Facilitator interviews, document analyses, and questionnaires issued to students were used as research instruments.

The findings suggested that, the way in which the instruction is designed for online learning determines students' and facilitators' PEI, and students' and facilitators' PEI impact directly on the learning outcomes. Students' and facilitators' PEI also redirect learning to social activity of knowledge construction. On this basis, learning communities, collaboration and discussion play a pivotal role in facilitating students' and facilitators' PEI for online courses. Feedback and reflection were found as excellent ways to facilitate students' and facilitators' PEI that encourage the sharing of knowledge. However, learner isolation remains a challenge, especially with large online classes and students that lack technological background.

Keywords: Online learning, instructional design, learning communities, participation, engagement, and interaction.

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Abbreviations

Email ..... Electronic mail
ICT ..... Information and Communication Technology
ID model ..... Instructional Design model
PEI..... Participation, Engagement, and Interaction
Wi-Fi .....Wireless Fidelity

Chapter One
Introduction and Background

1.1. Introduction

Online learning facilitates communication through computer networks between students and facilitators. It can thus be an alternative to face-to-face instruction for access to education to many students at any given time. This could be the reason that most instructors approach online learning as distance education delivered like face-to-face instruction that uses computers for instruction (Harasim, 1989). Such an instruction approach may exclude the interaction (two-way), and apply a top-down way of communication and or use synchronous teaching. Consideration of how students learn online should be made if their experience is to achieve set educational goals. Thus, instructional design for online learning would play a significant role in ensuring students have the same communication and experience, or even more than, as in face-to-face learning environment.

There are numerous ideas on instructional design and supporting models available for online learning. Generally, instructional and curriculum designs attempt to address the following questions (Lattuca & Stark, 2009): Why do facilitators initiate the instruction (aims)? What should they teach to realise their set aims and objectives (content or subject matter)? How can they interconnect target learning experiences (pedagogy, instruction)? What have they realised and what actions should they take in relation to the instructional program, students, and facilitators themselves (evaluation)? Although most, if not all, designs include these questions, they differ in how they address them (questions) because of the philosophy and model on which a design is based (Mohanasundaram, 2018; Lattuca & Stark, 2009).

Instructional design refers to the ways in which the designers organise the instructional components or procedures (Mohanasundaram, 2018; Lattuca & Stark, 2009). In online learning, actions of students' and facilitators' Participation, Engagement, and Interaction (PEI) are arranged as instructional components. Computer mediated instruction, especially online, requires students' and facilitators' PEI for learning to be successful. Kearsly (2000) pointed that online learning is shaped by collaboration, student centeredness, community, shared knowledge, and multisensory experience. All these can be achieved by incorporating students' and facilitators' PEI in the instructional design.

Online learning has increasingly been on demand due to massification in higher education (Hornsby and Osman, 2014), as students from diverse economic backgrounds gain knowledge independent of time and location. However, this move comes with considerable problems that tend to annul online learning benefits to education. An instructional design that does not help in facilitating students' and facilitators' PEI for online learning precipitates these problems. Kebritchi, Lipschuetz & Santiague (2017) grouped these problems into three categories: *Online students* (expectations, readiness, identity and participation), *Facilitator* (poor time management and teaching styles not aligned with learning outcomes), and *Content development* (integration of multimedia in content, and the role of instructional strategies in content development that at times do not benefit students).

The argument for the focus on instructional design in this research is that success in delivery and achievement of learning outcomes hinges on the design aspect. Online learning course-delivery depends on the design and what constitutes the learning environment. It is for this reason that this study does not attempt to prescribe any conditions around delivery, but focuses on interpreting how online learning instructional design facilitates students' and facilitators' PEI for online courses.

1.2. Problem statement

A limited number of students complete online courses than those studying in-campus, and this is due to various challenges that relate to instruction, and ICT infrastructure (Levy, 2007; Boston & Ice, 2011; Patterson & McFadden, 2009). This is a reflection on online learning instructional design that may not take into consideration the available resources and the importance of incorporating students' and facilitators' PEI in its courses (Croxton, 2014).

Prior to the 2020 lockdown due to COVID 19 restrictions, most South African universities had been offering their programmes either through blended learning approach or face-to-face. A sudden shift away from classroom to pure online learning exacerbates students' challenges and compromises learning. In their study, Cranfield, Tick, Venter, Blignaut, & Renaud (2021) found that, most higher education students found it hard, or even impossible, to adjust and study remotely due to socioeconomic status and technological footing in South African, and these lead to student failure and dropouts. The shift, in this case, to remote learning was a major change to both students and educators. It is therefore in the interest of this study to investigate how online learning instructional design facilitates students' and facilitators' PEI for two online courses to minimise student failure and dropouts. The general assumption is that, instructional

design should maximise the students' and facilitators' PEI through activities, enable communication that stimulates perspectives, and increase chances for feedback and reflection (Brown & Voltz, 2005).

1.3. Purpose of the study

The purpose of this study is to investigate how online learning instructional design of two online courses offered in a South African university facilitates students' and facilitators' PEI.

1.4. Objectives of the study

The objectives of the study are:

1. To determine how online learning instructional design of two online courses facilitates students' and facilitators' PEI.
2. To understand the facilitators' perceptions on online learning instructional design facilitating PEI for two online courses.
3. To identify students' responses to online learning instructional design in terms of facilitating PEI for two online courses.

1.5. Research questions

Main research question:

- How online learning instructional design of two online courses does facilitates students' and facilitators' PEI?

Sub-questions:

1. What are the perceptions of the facilitators on online learning instructional design facilitating PEI for two online courses?
2. What are the students' responses to online learning instructional design in terms of facilitating PEI for two online courses?

1.6. Significance of the study

There are numerous studies delivering statistics and features of online learning, but less is said on qualitative analysis from the facilitators' and students' point of view regarding active learning, through PEI, in online learning (Blackmon & Major, 2012). PEI add value in motivating students, and contribute in lessening students' dropout or failure rate. With better understanding of how online learning instructional design facilitates students' and facilitators'

PEI in online learning, educational institutions would be able to give necessary skills and resources to help designers and facilitators to design improved and effective online learning instruction.

1.7. Assumptions

The overall opinion was that online learning instructional design should reflect and facilitates students' and facilitators' PEI that would inspire learning online. Therefore, this would impact positively on students' performance, and reduce student dropouts or failure rate.

1.8. Scope

The study focused on online learning instructional design and with particular interest on PEI which aligned to constructivism views. The scope of this study was also limited to two online courses within the programme of a specific department. Two facilitators were interviewed, document analysis of the course outlines (units) was done, and questionnaires were completed by twenty randomly selected students from the two courses understudy to collect data.

Chapter Two
Literature Review

2.1. Introduction

The quality of knowledge gained in an online learning environment is basically dependent on the instructional design. This study therefore investigates on how the online learning instructional design of two online courses offered in a South African university facilitates students' and facilitators' PEI. Instructional design facilitating PEI promotes cognition that is aligned with active learning. Vygotsky (1978) considers active learning to be a social activity and that falls under constructivism, a theory that this study hinges on. This chapter discusses students' experiences in online learning, learning theories for online learning, and PEI in online learning. It concludes with the presentation of Salmon's (2004) five-stage framework that this study adopts as its theoretical framework.

2.2. Learning theories for online learning

This literature review begins with engaging learning theories that should help understand how learning happens online to determine what should be taken into consideration when designing the instruction that facilitates students' and facilitators' PEI in online learning. Cooper (1993), and Dietinger (2003) consider three major theories as very important in an online learning environment as they influence the design aspects of the instruction and also the curriculum.

1. Behaviourism:

Behaviourism states that behaviours or actions are acquired from the environment, and they are just responses to environmental stimuli, innate or inherited factors have minor influence on behaviour (Watson, 1913). Learning strategies within behaviourism include drill and guided practice, question and answer, regular review, and positive reinforcement. Courses' instructional designs should follow a logical and structured approach that is aimed at helping students to acquire basic concepts, skills, and factual information, and this is required in a behaviourist's teaching strategy (Moedritscher, 2006). There are tools that can be accessed online that can facilitate drill and practice and give instant feedback that promotes behaviourist learning (Moedritscher, 2006). The challenge with the behaviourism approach is that deeper learning experiences may be difficult to achieve (Moedritscher, 2006). To facilitate deeper learning, PEI should be associated with reward that can be used to draw students into deeper engagement with content.

2. ***Cognitivism*:**

Cognitivism is a theory that focuses on the idea of "learning processes and addresses the issues of how information is received, organised, stored and retrieved by the mind" (Ertmer and Newby, 2013, p.51). Different aspects from chunking the content into smaller parts and supporting varied ways of online learning, to concepts like metacognition, collaboration, and motivation that must be considered by instructional designers for students' easier processing of information in cognitivism (Moedritscher, 2006). For this reason, chunked content and collaboration are valued for students' and facilitators' PEI as they enhance understanding. However, if a student does not have relevant prerequisite knowledge (experience), this may adversely affect their ability to participate, engage and interact with other learners, the facilitator, and content. Moedritscher (2006) argues that, to account for this gap, instructional designers and facilitators must ensure they give instructions that cater for all skill levels and experiences.

3. ***Constructivism*:**

Constructivism is a theory that associates learning with making meaning from experience (Bednar, Cunningham, Duffy, & Perry, 1991). It is famous in the learning scope of experiential, context-aware, self-directed, and reflective practice (Moedritscher, 2006). It has advantages like PEI, "…presentation of content from multiple perspectives, the active knowledge construction, and development of meta-cognitive strategies" (Moedritscher, 2006, p.8). Vygotsky (1978, p.57) contends that;

> "…every function in the child's cultural development appears twice: On the social level (between people or interpsychological) and, on the individual level (inside the child or intrapsychological). This applies equally to voluntary attention, to logical memory, and to the formation of concepts. All the higher functions originate as actual relationships between individuals."

Vygotsky believes all knowledge is socially constructed and that the community plays a pivotal role in the meaning making process. Teaching and learning are therefore about negotiating socially constructed knowledge and sharing it. For instance, social interactions from guided learning within the zone of proximal development where students can, with the help from adults (facilitators) or their peers who are more advanced, master concepts and ideas that they cannot understand on their own (Vygotsky, 1978). Students and their colleagues co-construct knowledge, giving birth to cognitive development. This is aligned with social constructivism

that facilitates active learning. Meaning making, as a result, is dependent on communication and collaboration for social constructivist instruction. It is for this reason that social constructivism was considered for this study because it can inform students' and facilitators' PEI in an online learning using appropriate tools or media.

In a learning environment, students can be exposed to all the three theories, and this depends on the instructional design and stands to gain from the different teaching and learning approaches. While there is no single best approach (behaviourist, cognitivist, or constructivist) in terms of efficiency in learning, learning is complex and influenced by many factors (Ertmer & Newby, 2013), and it constantly changes in nature and diversity (Shuell, 1990). The important thing is, which theory is most effective to foster the mastery of specific tasks by specific students (Ertmer & Newby, 2013) at any given point? Nevertheless, this study is interested in understanding what instructional design aspects or procedures afford students' and facilitators' PEI in online learning. These concepts are constituted in social constructivists teaching approaches that facilitate development in learning. However, the other two theories cannot be ignored, as they are engaged in the learning process that facilitates cognitive development in students.

2.3. PEI in online learning

Students tend to benefit more from learning with the instruction and platforms designed to allow them to participate, engage, and interact with each other and facilitators. The theories covered in the previous section demonstrated the importance of designing online instruction that takes into consideration students' involvement and thus not treat teaching technology as delivery trucks with no other function that adds value to learning - an idea that Clark (1994) used to discredit the recognition assigned to digital technology. In this section the three aspects understudy are discussed.

2.3.1. Participation

Participation is referred to as actions indicating forms of involvement performed (Goodwin & Goodwin, 2004). It is aligned to constructivism in online pedagogy, and this is made possible in structured online discussion, collaborative online activities, online assessment, and interactive course material (Mason, 1998; Shalni, 2008). It can also include question and answer, and commenting about the content in the course or other materials (Gilmore & Schall,

1996; Burchfield & Sappington, 1999). As students participate, they are able to construct their own knowledge in online learning environments.

Online students appreciate being given the chance for regulating their own learning, like working with course materials and setting their own pace as they participate in online discussions (Mitchell & Honore, 2007; Lin & Wang, 2012; Poon, 2012). Asynchronous online participation helps students acquire more time for a deeper and more thoughtful reflection or regulation for evidence of learning. When the facilitator awards points for participation, for example, discussions, wiki creation, and so on, the learning platform makes it easier to evaluate, or track students' performance by linking grade book with participation activities in online learning (Stein & Graham, 2014). In such a case, the facilitator should clearly articulate the expectations for students' participation that would result in a score (Stein & Graham, 2014). A rubric is essential for both providing feedback, and setting those expectations (Stein & Graham, 2014). In addition, there must be a time frame to every activity displayed for the students. By doing that, students can be more autonomous and develop habits of working abidingly in a flexible online rhythm towards their successful learning.

Wallace (2003, p.253) in his study discovered that "…students participate actively in online classes in which discussion is valued. They create social presence by the nature and content of their participation, and social presence seems to be an important element of both satisfaction and learning." He further pointed that social presence is more important at the beginning of the course to motivate students during orientation to the course (Wallace, 2003). In addition, Salmon (2000) in her framework of online instructional and curriculum design advocates for the building of community or social presence in the first stages, whereby individuals establish their identities and select others with whom they create connection. This points to the importance of instructional design with structured components or procedures that create contextually relevant, and responsive learning environment for facilitators and students in online learning.

On the point of community building, Fisher & Baird (2005, p.96) added that "…working in groups (collaboration) forms social bonds, and as they deepen, motivate students within the group through participation to the collective knowledge of the group." Riel (2000, p.8) has defined a learning community as: "A group of people who have a shared interest in a topic, task, or problem; respect for the diversity of perspectives; a range of skills and abilities; the opportunity and commitment to work as a team; tools for sharing multiple perspectives; and

knowledge production as a shared goal or outcome." Therefore, students building knowledge in association with knowledgeable others by an interactive group in which every member participate could reduce a sense of isolation that is normally experienced in online learning and that leads to loss of interest in learning (Salmon, 2004).

It is not always lack of interest or motivation or a frustration in the course that causes online students not to participate. Fisher & Baird (2005) suggests that a number of factors can contribute to students' lack of participation where instructional design is not a problem, such as family or medical issues, and socioeconomic challenges. It can also be the inability for a student to find relevance in their activities (Fisher & Baird, 2005), and this discourages students to explore further and maintain participation in the course. Facilitators should develop avenues for guiding students into total participation.

Facilitators must be minimally active in online learning, for example, in discussions to avoid a decline in students' participation because of the fear of misunderstanding or disagreement (Dixson, 2010). Dennen, Darabi, & Smith (2007) supported this by stating that, too much facilitator participation, such as in discussion forums, decreases students' participation from fear of making mistakes. Facilitator's presence should just be the phenomenon that helps translate virtual activities into impressions of *'real'* people (Dennen *et al*., 2007), not intense participation in activities.

2.3.2. Engagement

Engagement is the value of effort devoted in educational activities towards achieving desired outcomes (Hu & Kuh, 2001). It is also defied as "…willingness, need, and compulsion to participate in, and be successful in, the learning process..." (Bomia, Beluzo, Demeester, Elander, Johnson, & Sheldon, 1997, p.294). Briggs (2015), on the other hand, has described engagement as the level of interest or devotion shown by students, their interaction standards with course-mates, and how motivated they are about their learning. When students are engaged, they take an active role and they become co-creators of knowledge or learning (Davis & Sumara, 2002; McCulloch, 2009). Quality learning is through the instructional design facilitating meaningful (active) engagement, rather than passive transmission, of knowledge (Dobrovolny, 2006; Brown & King, 2000). Meaningful engagement is not all about sending many messages. It is about students following discussions, and making reflections, be able to individually construct meaning through learning and experiences (Garrison & Cleveland-Innes, 2005). Hickey & McCaslin (2001) have suggested that socio-constructivist perspectives do not

necessarily prohibit the concept of self-regulation, but framed within the context of students increasing their engagement in communities of practice.

Engagement is one of the primary components of online learning (Dixson, 2010), hence it becomes essential for facilitators to learn what engages students. Harper & Quaye (2009) addressed engagement as requiring activity, sense-making, and feelings. Trowler (2010, p.5) in support said, "…acting without feeling engaged is just involvement or even compliance, feeling engaged without acting is dissociation." Fredricks, Blumenfeld, & Paris (2004, p.62-63) in their discussion drawn from Bloom (1956) on dimensions to student engagement by facilitators stated the following:

1. *Behavioural engagement*: Students who are behaviourally engaged will typically comply with behavioural norms, such as attendance (constant logging in to learning environment) and involvement, and will demonstrate the absence of disruptive or negative behaviour.
2. *Emotional engagement*: Students who engage emotionally will experience effective reactions such as interest, enjoyment, or a sense of belonging.
3. *Cognitive engagement*: Cognitively engaged students will be invested in their learning, will seek to go beyond the requirements, and will relish challenge.

Trowler (2010, p.5) stipulated that the above dimensions can possess "…both a positive and a negative pole, each representing a form of engagement separated by a gulf of non-engagement (apathy or withdrawal)," and a student can fall under a positive or negative engagement along those three dimensions as shown in Table-1.

Table-1: Positive and negative engagement (Trowler, 2010, p.6)

Dimensions	**Positive engagement**	**Non-engagement**	**Negative engagement**
Behavioural	Attends lectures, participates with enthusiasm	Skips lectures without excuse	Boycotts, pickets or disrupts lectures
Cognitive	Meets or exceeds assignment requirements	Assignments late, rushed or absent	Redefines parameters for assignments
Emotional	Interest	Boredom	Rejection

Coates (2005, p.26) added that student engagement is constructivism as;

> "…learning is influenced by how an individual participates in educationally purposeful activities. It is seen as a joint proposition…however, which also depends on the

institutions and staff that provide students with the conditions or designs, opportunities, and expectations to become involved."

Several authors proclaim that personal development and achievement of online students can strongly be predicted by student engagement (Kuh, 2003; Astin, 1993; Baker, Spiezio, & Boland, 2004). Care must be taken regarding the *student's effort, personality, attitude, motivation, and self-esteem (confidence)*. Mandernach, Donnelli-Sallee, & Dailey-Hebert (2011) argue that if these affective factors (above) are taken care of, students would engage more in their education. Another factor that can affect students' engagement is facilitation in online learning environments. Treatment from the facilitators can change how the students try to comprehend learning (Oncu & Cakir, 2011), and perceptions of some students from how they are regarded by others can result in disengagement (Donnelly, 2009).

2.3.3. Interaction

Interaction is the act of communicating with other people or doing things (Meriam-Webster, n.d). It can be in the form of student-to-facilitator, student-to-student, or student-to-content (material). Each of these contributes differently to learning experience (Hannon & Macken, 2014). Anderson (2004) proposes that the instructional design should be organised around the three mentioned interactions with the aim to facilitate active learning that is a principle of constructivism. Snowman & Biehler (2000, p.291) confirm that "meaningful learning occurs when people, together, actively try to make sense of the world, when they construct an interpretation of how and why things are, by filtering new ideas and experiences through existing knowledge structures…" The concept of student-to-facilitator, student-to-student, and student-to-content interactions is illustrated in table-2 below.

Table-2: Designing learning around three interactions (Hannon & Macken, 2014, p.4)

Student-facilitator interaction *(how students interact with facilitators*)	**Student-student interaction** *(how students interact with each other)*	**Student-content interaction** *(how students interact with content)*

• Learning activities and assignments. • Lectures, tutorials and workshops. • Discussion in virtual class, online conferencing and forum, blogs in Learning Management System (LMS). • Debates and role plays. • Investigations, field work, surveys. • Quizzes and formative assessment.	• Collaboration, group work and learning communities. • Discussion forums, community journals. • Problem-based learning activities. • Peer review, shared files. • Project work. • Reflective writing, blogs.	• Individual student activity. • Self-study exercises. • Review of recorded lectures. • Applying readings from textbooks, LMS and library. • Case studies. • Self-assessment and quizzes. • Reflective writing, journals, portfolios.

There is another type of interaction introduced by Hillman & Colleagues (1994) called student-interface interaction. This is what mediates between a student and all the dealings regarding the course content. The interaction in this type is generated by multimedia applications (Kurtz & Sponder, 2010), through the capable online learning environment included in the instructional design.

2.4. Students' experiences in online learning

Online learning students are exposed to various ways of learning, and affordances of various Information and Communication Technology (ICT) tools or media. They have preferences too, and therefore the learning environments should support student-centred methods to achieve successful learning for all students. The internet enables various educational activities that support student-centeredness. For instance, the internet facilitates instructional delivery through asynchronous networks for learning, like podcasts, videos, wikis, blogs, search engines, and through synchronous online seminars.

Often times, online students experience a feeling of isolation. Salmon (2004) defines isolation in the following ways: being alone (situated place) and feeling alone (thought or psychological). She believes her model and framework for e-learning and e-moderation has processes that remove feeling of isolation and the interaction that it creates among participants as they get engaged and participate in courses is most fulfilling (Salmon, 2004).

Online learning gives students an ability to self-directed learning opportunities and flexible ways for PEI, which according to Belz & Muller-Hartmann (2003) increases students' levels of autonomy, self-direction (motivation), and the emotional independence. Vygotsky (1978)

describes learning as a social activity and PEI is paramount in developing cognition that consequently falls into active learning (Buchberger, 2000; Kearsley, 1994). The social interaction is stated by Hall & LeCavalier (2000) as the most powerful tool for skills development and enabling active student participation towards traditions of co-construction of knowledge. Multiple learning experiences promote acquisition of knowledge and this can be enriched with reflections, activities and feedbacks through PEI. Learning, as part of a team, enables students to develop collaboration skills (to gain important skills in co-construction of knowledge), critical thinking, and self-reflection.

Student-centred methods make use of past experiences, support active participation, explore needs and interests of students, stimulate higher order thinking, and inspire lifelong learning (Bonk & Cunningham, 1998). When the instruction is designed, the focus should therefore be on the students, how they learn, and their existing knowledge that they can be helped to build on.

2.4.1. Instructional Design models

Instructional Design (ID) models are based on how students learn, how the course or instructional materials are framed, and the activities are built into a specific structured manner. Bara (2010) classifies ID models into, system oriented, product oriented, and classroom oriented. Within these classifications, several ID models are available and more continue to be developed. The reason is that each model is developed for its specific purpose. Thus, instructional designers for online learning keep developing and combining ID models because they are searching for specific components or functionalities that can work best for them than what is available, in order to achieve learning outcomes.

The researcher in this study decided to use Salmon five-stage model for e-learning and e-moderation (online-learning and online-moderation) as a guide for online learning instructional design, and that was due to the concepts being explored. This model caters for PEI that is key to this study, and it is discussed in details in the section on theoretical framework of the study because it can both be used as an online ID model and a framework for online instructional and curriculum design (Salmon, 2000, 2004). It comprises five stages and has both technical aspects for using online system and the structure of instruction. It has elements of communication and community engagement for collaboration, and thus, it complies with the social constructivism approach in nature. In addition, this model is developed with the purpose

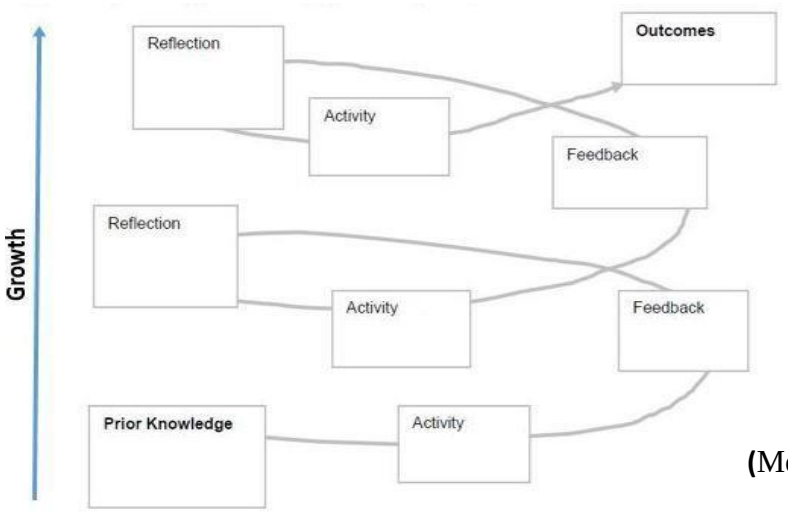
of providing greater participation and interaction among course participants, and it structurally aligns with scaffolding principles (Salmon, 2004).

Scaffolding in Salmon's five-stage model demands that the facilitator ensures he understands the students' pre-existing ideas, and then develops or uses activities to guide learning and later builds on them (Oliver, 2000). Scaffolding is an important feature in teaching. The facilitator for online learning continually adjusts his level of help in response to the student's level of performance (McLeod, 2019).

2.4.2. Learning pathways

There are various learning pathways that can be adopted into the structure of courses. These pathways are helpful in channelling instructions or activities in a particular manner for students' better learning experience. Instructions are categorised, sequenced, and delivered according to the chosen pathway. Like ID models, the best pathway is that which contributes towards achieving learning outcomes for the institution. Pathways complement the ID model/s used. For this study, consideration was placed on pathways that facilitate students' and facilitators' PEI with elements, for instance, of shared activities, feedback, reflection, scaffolding, and an idea of student centeredness, which can be adopted into the structures of courses. An example of such a pathway is SAIDE's Learning Cycle (Mays, 2014), and it is displayed in figure-1 below. Like Salmon's five-stage model, student's experience moves from being less complex to more complex along the scaffolding process as learning progresses and student's knowledge grows. This means that as the spiral of the pathway enfolds, new or acquired experience becomes greater than before (Kolb, 1984). In online learning instructional design, pathways become important for direction of instruction (see figure-1).

Figure-1: SAIDE's Learning Cycle (with some modification)



(Moll & Drew, 2008, p.2**)**

In a spiral of a pathway shown in figure-1, prior knowledge is based on existing knowledge and experience of what the facilitator expects the students to have. This, for instance, can be about a topic, and the facilitator incrementally introduces new ideas by giving an activity. The students think and reflect on what has been said or given, and then do the activity. In the activity section, it is where the actual acquisition of new knowledge happens as students actively construct meaning with the help of each other and the facilitator. This is the central view of constructivist approach to teaching and learning (Moll & Drew, 2008). After the students have done the activity, a facilitator and other students provide feedback. This guides students towards possible or correct responses. Students at this point can reflect on what they have done wrong or right, and through that engagement more knowledge is gained. Based on what knowledge students have acquired, the facilitator then introduces new ideas by giving another activity. This is how the spiral enfolds and knowledge increases until the outcomes are reached. Knowledge growth is shown in the figure by an arrow pointing upwards.

2.5. Theoretical framework

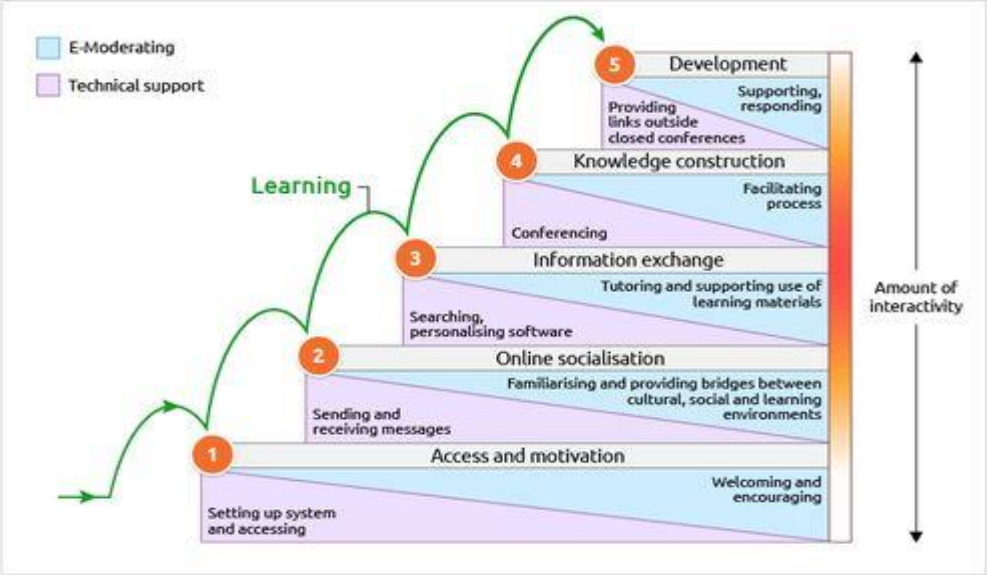
This study adopted Salmon's (2004) framework about online instructional and curriculum design procedures to investigate the phenomenon under study. It is a framework for e-learning (technical support) and e-moderating. According to Salmon (2004), the framework makes clear the central role of the facilitator (e-moderator) and the importance of socialisation, collaboration, active learning, and student knowledge construction in learning environments. It is therefore ideal for this study. It also aims to provide guidance on how to support online students in becoming confident or staying motivated and manage their own learning (Salmon, 2004). Salmon's five-stage framework is therefore a constructivist based framework which provides a staged and practical approach to online moderating and online learning that prioritises students' and facilitators' PEI.

There is enough interactivity embedded, as shown in figure-2 below, and the students' participation and engagement can also be noted from stage one (access and motivation) until the last stage (development) with activities from both the facilitator (facilitating) and students (technically supported via online learning environment).

Learning is acquired through scaffolding as new or acquired knowledge is added on existing or prior knowledge towards achieving the course outcomes. Salmon's five-stage framework gives a clear view on how the instruction can be designed for online courses, not just from the perspective of activities. The students would need to participate, interact, and engage in

activities as the courses progress. There is also the perspective of technical support that students would need if they will be more self-directed and active in online courses. The researcher has chosen this framework and elaborated on its components below.

Figure-2: Salmon's five-stage framework (Salmon, 2004, p.11)



E-moderating in the framework in figure-2 shows the facilitator's activities, and *technical support* covers the students' activities.

Stage-1 in the first orange circle is at the level of *Access and Motivation*. Instructional design would entail welcoming of students into the course and encouraging them to participate in the activities throughout the entire learning process. They will also be given guidance on where or how to find technical support regarding the system or learning environment. Students will access and set-up the system by providing required details. They will be engaged in this process until the facilitator is satisfied with whatever is needed and demonstrated by the students to facilitate easy navigation through the system.

Stage-2 is *Online Socialisation*, the facilitator guides students towards building learning communities, making introductions, being familiar to each other, and then, he lays out ground rules for the course. Students will send and receive messages from each other, guided by the facilitator who will clarify any point that needed clarification including technical support if needed. Up to this point, student experience focuses on using the system and on building communities.

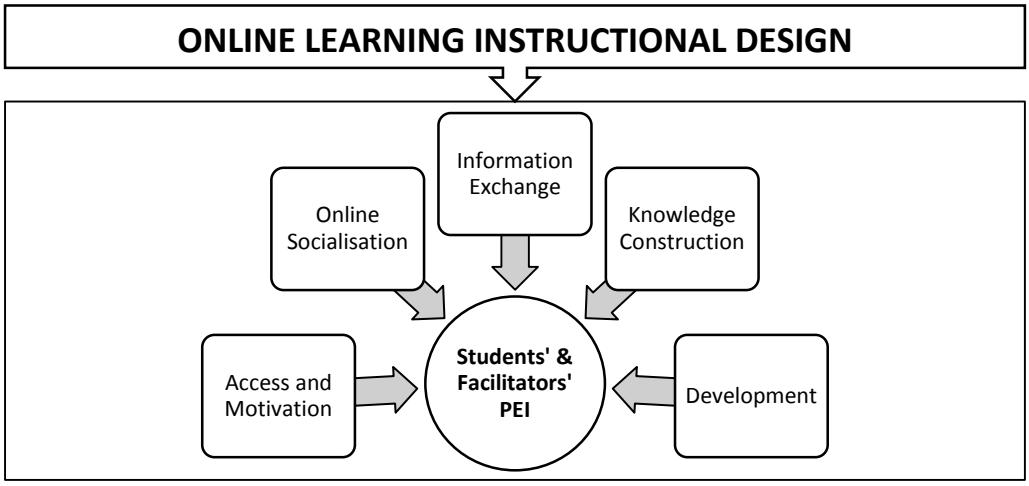
Stage-3 is about the *Information Exchange*, whereby the facilitator facilitates organised activities that have been channelled in a specific manner according to the chosen pathway (if

the pathway was implemented) following educational philosophies. The facilitator assigns roles and responsibilities, supports use of learning materials, encourages discussions, and summarises outcomes for students. Students carry out activities, reports, discusses findings and are technically supported by the institution's support service and the facilitator.

At **Stage-4** there is *Knowledge Construction*, the facilitator gives feedback and guides the students' learning progress as learning continues. He asks questions, encourages reflection, as well as supporting, technically or otherwise, where it is needed. Students actively engage in their online discussions, online conferencing, and apply critical thinking as they co-construct their knowledge. Knowledge construction happens on every stage with every activity that students do. The facilitator ensures he understands the students' pre-existing ideas from previous activities or experience, and uses activities to address those ideas, and then builds on them (Oliver, 2000). This is how the facilitator scaffolds students' learning in this framework.

Stage-5 is the *Development*. Students would at this stage be advanced and perform activities in a strategic way. Their level of communication has been improved, they integrate ICT and forms of learning, reflect on their learning process, make reviews for each other, and become critical of the medium. At this stage, they can link learning with their profession. The facilitator responds and supports (technically or so) only when required. There is enough amount of PEI in Salmon's five-stage framework, and knowledge growth is shown in the figure by an arrow going upwards with the stages. While the amount of interactivity is indicated in the diagrammatic representation of the framework (see figure-2), engagement and participation are facilitated within each stage. The ultimate goal in the design of Salmon's five-stage framework is to improve students' learning by facilitating PEI. The following conceptual framework, in figure-3, is a simple illustration of how this study envisages the association of the Salmon's framework for an online learning instructional design that facilitates students' and facilitator's PEI for online courses. The findings of this study elaborate on how online learning instructional design facilitates students' and facilitators' PEI for two online courses.

Figure-3: Conceptual framework



2.6. Chapter Summary

Online learning, as discussed from this chapter, requires students' active PEI, a lot of discipline from the students, control, and motivation to stay within the communities. The internet and ICT advances the interactive nature of learning online, and because of the internet and media affordances; there is a strong sense of social communities that help students to feel belonging to a particular part of society. In order for online learning instructional design to facilitate students' and facilitator's PEI, there should be Access and Motivation, Online Socialisation, Information Exchange, Knowledge Construction, and Development for successful online learning as envisaged in conceptual framework (figure-3). The literature emphasises that instructional designers should have a solid plan before embarking on the process of designing the instruction for their courses. It is very important to know why one does what in designing, and follow a particular pathway to be consistent and coherent in his plan as an instructional designer. The planning is driven by specific content (for example, trying to facilitate PEI) and it guides design efforts, including theories, ID models, and pathways.

Chapter Three
Methodology

3.1. Introduction

This study aimed to investigate how online learning instructional design of two online courses offered in a South African university facilitates students' and facilitators' PEI. Adam & Healy (2000) stated research methodology as an approach to investigate the issue of concern, and within that, specific research methods or approaches and tools are used to meet the declared research objectives. Research methodology is also considered as the process to collect and analyse the necessary data (Adam & Healy, 2000). Thus, the following units explain this study's methodology that adopts Saunders, Lewis, & Thornhill (2007) onion as it captures the main features for the process, namely; research philosophy, research approach, research strategy, and data collection methods. This chapter also includes; research site, data analysis procedure, challenges, trustworthiness, and ethical considerations for more clarity.

3.2. Research philosophy

In the outer lane of Saunders et al.'s (2007) research onion, are the research paradigms or the philosophical underpinnings that locate the investigation. The researcher considered interpretivism as the most appropriate philosophical standpoint for this research's investigation. Interpretivism focuses on understanding phenomena from what people assign meaning to them, thus information about events is collected, and inferences are drawn or judging match between collected information is carried out (Antwi & Hamza, 2015; Deetz, 1996). This study investigates a phenomenon by making sense or constructing meaning around the participants' perceptions.

3.3. Research approach

The next level in the research onion is the research approach. According to Yin (2003) there must be a detailed plan of the approach for conducting the research. Therefore, for the manner of this research being exploratory, the researcher had chosen the inductive approach to uncover the phenomenon for this qualitative research. The researcher developed the findings inductively by systematically analyzing qualitative data using investigative tool developed in this study. With inductive approach, data is analysed for patterns to inform generation of evidence (Saunders et al., 2007).

Qualitative research consist of a set of explanatory practices with the ability to make some problems or cases much visible to the people (Denzin & Lincoln, 2005). Maxwell (2005, p.3) illustrated qualitative research as "…a logical strategy and ongoing process that involves interaction between the different components of the design from theories, goals, and research questions to the validity for one another." Since the subject being addressed involved high levels of uncertainty, and the problem not clearly understood, for example facilitators still regard instructional design as a complex activity and only now coming to terms with ICT integration into the curriculum, this study provided insights into a new phenomenon of designing online learning instruction with regard to facilitate students' and facilitators' PEI.

3.4. Research strategy

Research strategy refers to the manner in which a researcher intends to carry out the research work (Saunders et al., 2007). Therefore, qualitative data was processed using case-study research strategy. That is, 'the case' in this study is to investigate how online learning instructional design of two online courses offered in a South African university facilitates students' and facilitators' PEI. This strategy helps to gain an in-depth understanding of issues (Saunders et al., 2007). Thus, with case-study, the researcher intended to make sense of participants' perceptions and actions within the context of the study.

3.5. Research instruments or data collection methods

In order to achieve the research objectives, data that was used had been collected from both primary and secondary sources. Primary data was collected in two ways: Telephone and WhatsApp-call interviews with two facilitators (Facilitator-1 and Facilitator-2), and unstructured questionnaires issued to the students of two online postgraduate courses (Course-A and Course-B) through online delivery method using Google forms, to gain insight about the phenomenon understudy. Secondary data was from the course outlines through document analysis. It added value by supplementing the primary data.

In summary, the researcher used the following data collection methods; individual facilitators' interviews, students' questionnaires, and document analysis. The interview questions, and questionnaire are found under appendices section (appendix-1 page-84, and appendix-2 page-85) respectively. The researcher began the discussion of data collection methods with sampling (to select the participants and manage data), research site (as where the study was carried), the

information about the participants, individual facilitators' interviews, document analysis, and students' questionnaires.

3.5.1. Sampling

Sampling is a technique for selecting a subset of items from population or a sample (part of the population) to represent the whole population in the study (Guest, Namey, & Mitchell, 2013). For the researcher to generalise the interpretations of the population, sampling was performed. In qualitative research, if the study seeks to generalise interpretations to a population, simple random sampling technique can be used (Johnson & Christensen, 2004). Therefore, the simple random sampling was used for the selection of students enrolled in the two online courses and for generalisation of interpretations, for example, number of times an idea emerges from the study's sample. Simple random sampling is a technique in which a sample is selected element by element, with equal chances of each element for being chosen at each draw completely by chance (Singh, 2003). The respondents were selected in a way that gave every student in the population equal chances of being selected for this study.

The study's population was restricted to the total number of students enrolled in the two online courses (Course-A and Course-B) from a specific department for the year 2021. There was a total of 20 students in Course-A and 28 in Course-B, but 16 students from Course-A and 18 students from Course-B voluntarily participated by completing the questionnaire. The researcher randomly selected a sample of 10 students from each of the two courses, making a total sample of 20 students out of the population of the entire students enrolled in the two courses.

The researcher could not reach participating students in this study himself due to national restriction around COVID-19 pandemic. Therefore, the university, under study, offered to provide all postgraduate students with access to the researcher's request of their voluntarily participation by completing the questionnaire through Google forms on internet. The researcher received many responses from the entire postgraduate level. However, to reduce the scope of the study to a sizeable project for this degree, he restricted students' responses to only two courses and performed simple random sampling technique for sampling of students.

The process was as follows: members of population of the two courses were numbered in sequential manner, their given numbers written in separate pieces of paper, these pieces were

folded, then mixed into a box, and samples were taken from the box by selecting folded pieces of paper randomly. This method is commonly used by the lottery.

For the facilitators (Facilitator-1, and Facilitator-2), the researcher selected two respondents as the sample from facilitators teaching courses at postgraduate level in one department. He used purposive (judgemental non-probability) sampling method for selecting the two facilitators. However, the sample being studied was not representative of postgraduate facilitators for that department. Rather, a choice depending on the purposing sampling. The procedure was straightforward, the researcher rejected individuals who do not fit the following profile when creating the sample, and selected the best two. Facilitators having:

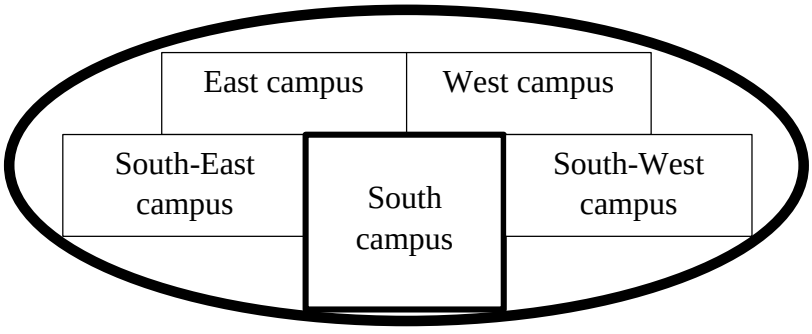
- More than four years facilitating.
- Knowledge about instructional design for online learning (example; facilitated modules on instructional design for online learning).
- Background knowledge of ICT to facilitate participation, engagement and interaction.
- Experience using technology for teaching and learning.

Finding facilitators of befitting profiles was easy because the researcher was familiar with people in that community. According to Cresswell & Clark (2011), purposive sampling helps to identify and select individuals that are experienced with or knowledgeable about a phenomenon of interest for better results. Therefore, purposive sampling was necessary for selecting facilitators in this research.

3.5.2. Research site

The institution on study is among those considered top by QS BRICS University Rankings of 2019 in South Africa and it is located in one of the big cities of South Africa. This institution is divided into five campuses that the researcher identified, for this study, as; East campus, South-East campus, West campus, South-West campus, and South campus as shown in figure-4 below. South campus is where the study was carried.

Figure-4: The institution on study



South campus is the school of education within the faculty of humanities. It offers a range of programmes in education some of which include Bachelor of Education, Bachelor of Education Honours, and Masters of Education degrees. The researcher, however, was interested in honours degrees within the programmes of postgraduate level, and he selected from there, two online courses (Course-A and Course-B) of a certain curriculum in one department because they serve together for the same qualification.

Criteria for courses' selection:

1. The courses should be facilitated by facilitators with knowledge about the phenomenon on study.
2. Facilitators of the courses should have background knowledge of ICT and experience using technology for teaching and learning.

These imply that facilitators were the primary participants in this study, and the students from the selected courses were facilitated by Facilitator-1 and Facilitator-2.

3.5.3. Participants

The researcher selected participants from specifically two postgraduate courses, the population of students in Course-A was 20 and in Course-B was 28. The researcher was able to receive 16 questionnaires from Course-A participants, of these 16 questionnaires five had to be omitted for being incomplete (16-5=11 complete questionnaires), making a 55% response rate ((11÷20)×100). From Course-B, he received 18 questionnaires and had no omissions, making a 64% response rate ((18÷28)×100). Majority of students-participants from both the courses were between the ages of 25-35 years.

The participants for the two interviews and document analysis conducted, were facilitators of Course-A and Course-B. They were between the ages of 40-50 years, and they had more than five years of experience facilitating. The researcher did not include gender of participants as it held no significance to the findings. However, age had some significance judging by Kock, Moqbel, Jung, & Syn (2018) statement that older adults portray having more experience than younger ones in their respective professions or fields, and they also display positive attitude towards computers or technology than younger adults (Dyck & Smither, 1994). Therefore, the researcher felt obliged to include age for both the facilitators' interviews and students' questionnaire to observe how old the participants were, for added experience and positive attitude towards technology that contributed in gaining insight about the phenomenon on study.

3.5.4. Individual facilitators' interviews

Individual interview is a qualitative data collection method by which communication is with one participant at a time face-to-face, or by any technology-aided means, to gain insight into participants' perspectives and experience about a given phenomenon (Frances, Coughlan, & Patricia, 2009; Boyce & Neale, 2006). The researcher structured questions that all interviewees answered in the same order for individual interviews to analyse data simple, by comparing and constructing different answers given to the same questions. Telephone and WhatsApp-call interviews were used as individual interviews; data was gathered by recording interviewees' telephone and WhatsApp-call conversations, and the researcher also taking detailed field notes during the two interview sessions following participants' desired responses to interview questions. Audiotapes were then used for recording the sessions and transcribed as soon as each interview was completed. The instant transcriptions made the researcher to capture all the responses without losing any valuable data as the information was still fresh in the researcher's mind. The telephone and WhatsApp-call interviews enabled respondents to freely respond to questions, hence providing detailed information about the phenomenon on study.

3.5.5. Document analysis

Considering document analysis, the research leaned on Voce's (2005) statement that documents, records, archives and artefacts provide a rich source of information, and that organisations have some kind of a trail of papers where some information can be mined as part of fieldwork, and he therefore included it to collect some secondary data for the study.

The aim for document analysis was to uncover information that was not found from the interviews and questionnaires, and supplement interviews' and questionnaires' data. Documents (items) collected were course outlines (see appendix-5 page 89). Documents were collected by means of Electronic mails (Emails) through the internet connection.

3.5.6. Students' questionnaires

Questionnaires are data collection methods that contain questions to elicit and get responses from respondents (Trueman, 2015). Questionnaires, as the chosen data collection method for this study, consisted of open-ended questions that were formed to bring about information that could be obtained through written responses of the matter and make respondents to answer questions in their own words and thus providing more valid details about their perceptions. Therefore, the researcher used unstructured questionnaires because, according to Trueman

(2015), unstructured questionnaires are created around open-ended questions to acquire participants' responses expressed in their own words, hence providing more valid data for qualitative research. Questionnaires were distributed by the researcher to the students from the selected two courses by means of Google forms through the internet as discussed in previous sections.

3.6. Data analysis procedure

Data collected was analysed objectively using an investigative tool developed by the researcher, and tables where it was necessary. The investigative tool will be discussed in details in the next chapter.

3.6.1. Interviews analysis

After data was transcribed (see appendix 3 and 4, page 87 to 88 for transcriptions), the researcher independently reviewed the transcripts line by line to decide PEI involved. For example new data from the first line was compared to existing data or the instructional design procedures in the investigative tool. As each new data has been analysed or data been compared, the results either point to PEI or no PEI created. All data was interpreted and presented descriptively based on the investigative tool. Information that did not seem to belong in any set of instructional design procedure was noted. This approach was important in the study for analysing participants' narrative responses word by word for patterns to inform generation of evidence. Findings were reached by combining evidence from all selected data collection methods by triangulation for both courses.

3.6.2. Document analysis

Data collected from the documents was also analysed by using the study's investigative tool. However, documents did not go through the process of transcription as Creswell (2012) mentioned that document analysis requires no transcription as they are already ready for analysis. Therefore, the process of analysis for documents was much quicker. Document analysis was used as supplementary to the data collected from interviews and questionnaires, and data from documents had assisted the researcher to discover pieces in the analysis. Findings were reached by combining evidence from all selected data collection methods by triangulation for both courses.

3.6.3. Questionnaires analysis

Like the interviews, data collected from the questionnaires was analysed using investigative tool. There were frequency counts used to relate to number of times the response emerged in analysis (generalising interpretations). Numbers enrich and complement narrative, increase transparency, and support findings in qualitative research (Black, 1994; Sandelowski, 2001; Neale, Miller, & West, 2014). Erickson (2012, p.1462) in support says, "…even though the analysis is qualitative, it is apparent that the researcher must pay careful attention to frequency of occurrence...it is necessary to count and make decisions…" The findings were reached by triangulating evidence from all selected data collection methods used for both courses.

3.6.4. Within-method data triangulation strategy

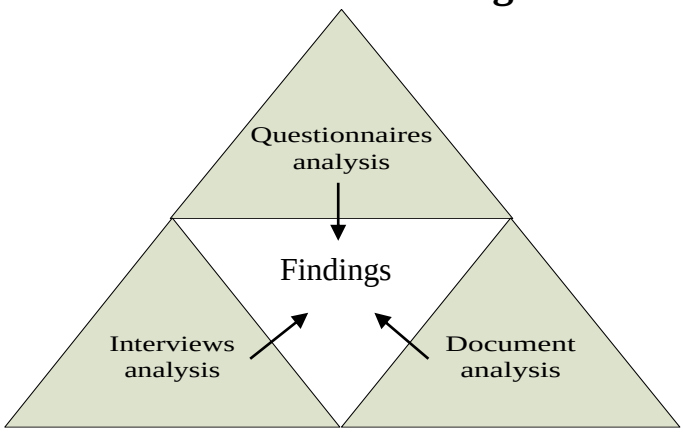


Figure-5: Data triangulation

In a qualitative research, triangulation is a means of using the strengths of one method to offset the weaknesses of another, and biases of one method will be compensated (Redfern & Norman, 1994; Burn & Grove, 1993; Denzin, 1989). For example, the interviews make it possible to gather a large amount of data over a relatively short period of time, but because it is dependent on the skills of the interviewer and the willingness of the informant to be open and honest the data may be erroneous or misleading (Marshall & Rossman, 1989). Figure-5 shows how triangulation was performed for both courses; the evidence from interviews analysis, questionnaires analysis, and document analysis were combined to reach the findings. These findings elaborate on how online learning instructional design facilitate students' and facilitators' PEI. With multiple data collection methods used together within one (qualitative or quantitative) study, each method contributes slightly different information leading to emergence of a more complete picture of the overall findings (Redfern & Norman, 1994; Burn & Grove, 1993). Thus, the reason for implementing within-method data triangulation in this study.

3.7. Challenges

Choosing telephone and WhatsApp-call for conducting the interviews, Google forms for questionnaires' issuing, and Emails for documents' collection, were a result of national restriction around COVID-19 and to prevent transmission and promote the safety of researcher and participants from the pandemic. The researcher had initially intended using face-to-face interviews, hardcopies for questionnaires and to be hand delivered, and anything including hard or softcopies for documents' type was expected and to be received hand-to-hand or by Emails. However, because of the pandemic he altered his plan as discussed and it took time. Also, some questionnaires had to be omitted for being incomplete, and this may have been a result of poor internet connection or data costs which would not have been the case with hand-to-hand delivery method.

3.8. Trustworthiness

According to Polit & Beck (2004, p.430), "Qualitative researchers are concerned with data quality and reflecting the true state of human experiences". Therefore, trustworthiness for this study involved establishing credibility, transferability, dependability and confirmability as stated by Guba & Lincoln (1994).

Credibility: The researcher took fieldwork notes during the interviews that he conducted, and each interview took approximately 40 to 45 minutes which prolonged the interaction between the interviewer and interviewees so to engage fully with the questions and ideas. Polit & Beck (2004) stated that prolonged engagement increases respondents' trust in the researcher, and thus they will feel comfortable about providing accurate and rich information about the phenomenon. The interviewees were provided with the transcripts for verification and comments. The researcher used variety of data collection methods from different sources, for example; interviews (primary source), document analysis (secondary source), and questionnaires (primary source) to facilitate credibility in findings.

Transferability: For the findings of this study to be transferable or applied to other contexts and settings, the researcher provided sufficient descriptive data collected to allow comparison. According to Polit & Beck (2004, p.435), "researchers can only provide the thick description, but it remains the responsibility of those wanting to transfer the findings to another situation to locate transferability." Because sufficient data was provided and made available to enable other

researchers to decide on the study's transferability, a conclusion will be reached by those wanting to transfer findings on whether a transfer could be made.

Dependability: Polit & Beck (2004) described dependability as the consistency of the findings in case the inquiry is replicated with the same subjects (matters) or in a similar context. For consistency, the research methodology of this study had been described in detail. The interview and questionnaire questions, document analysis criteria, transcriptions, consent forms, and information letters used are preserved for future auditing.

Confirmability: According to Polit & Beck (2004, p.435), confirmability refers to "the objectivity or neutrality of the data, that is, the potential for congruence between two or more independent people about the data's accuracy, relevance, or meaning." The researcher detailed the process of data collection, data analysis, and data presentation. Unique and interesting topics have been recorded, and thoughts about responses were written.

3.9. Ethical considerations

Before the fieldwork commenced, the researcher acquired permission from the university on study to have access to the information needed and conduct the study in its premises, the permission letter is found under appendix-7 page-91. The University of the Witwatersrand ethics committee granted the researcher permission to conduct the proposed study, ethical approval or clearance is found under appendix-6 page-90. Anonymity and confidentiality has been considered; the name of the institution, courses on focus, and names of participants were not disclosed. Participation was voluntary, and participants were informed beforehand. The researcher issued information letters and consent forms to participants indicating their participation, and the information shared was, and will not be, used for any other purpose except the one stated for the study. Information letters and consent forms are also found under appendices section.

Chapter Four
Development of Investigative Basis

4.1. Introduction

In the previous chapter the researcher outlined the research methodology. This was done based on the purpose of the study which was to investigate how online learning instructional design of two online courses offered in a South African university facilitates' students' and facilitators' PEI. Data collected was converted into meaningful understanding provided by the study's theoretical underpinning of Salmon's framework. In this chapter, the researcher developed investigative basis to analyse data to help understand online learning instructional design through the relationship between access and motivation, online socialisation, information exchange, knowledge construction, development, and their resulting PEI. The developed conceptual framework (see figure-3 under literature review), illustrates how the study envisages the association of the Salmon's framework for online learning instructional design that facilitates students' and facilitators' PEI for online courses. The following investigative tool (see table-8) is used to determine how online learning instructional design of the two courses understudy facilitates students' and facilitators' PEI. The tool is constructed from five stages of online instructional and curriculum design procedures coined by Salmon (2004).

4.2. Developing an investigative tool

This section presents the distinction between instructional design procedures (access and motivation, online socialisation, information exchange, knowledge construction, and development) for online learning, in order to understand how online learning instructional design facilitates students' and facilitators' PEI. Therefore facilitating PEI depends on the relationship between instructional design procedures. The following subsections describe different instructional design procedures for online learning and how they align to the investigative tool.

4.2.1. Access and motivation

Access and motivation describes the student's ability to use online tools and demonstrate eagerness to put necessary time and effort (Salmon, 2002). The main issue is that moderators (facilitators) welcome students and offer them support for encouragement, while students

engage and interact with the system, materials and online tools, and participate in setting up the system.

Table-3: Access and motivation

Instructional procedure	E-moderating	Technical support (E-learning)	
Access and motivation	Welcoming and encouraging	Setting up system and accessing	PEI

4.2.2. Online socialisation

Online socialisation is one of the characteristics of learning communities where students form groups and work together on collaborative tasks (Goodsell Love & Tokuno, 1999). Students are helped to realise that they have a base of people to communicate with and be supported by, as they engage in the learning process. The facilitator makes introductions for familiarisation in the online environment. Students are expected to express their needs, fears, and feelings at this point (Salmon, 2002). They participate by sending and receiving messages from each other. According to Salmon (2004), online socialisation should help students to establish an environment where all feel respected and, in turn, respect others for being in the same situation.

Table-4: Online socialisation

Instructional design procedure	E-moderating	Technical support	
Online socialisation	Familiarising and providing bridges between cultural, social and learning environments	Sending and receiving messages	PEI

4.2.3. Information exchange

The facilitator facilitates, organises activities, assigns roles and responsibilities, supports use of learning materials, encourages discussions, and summarises outcomes for students. The students engage in activities, appreciate the wide range of information available online, and become independent, confident, and more passionate about working online (Chen, 2007). They participate by exchanging information, and interact with peers, facilitator, and course materials.

Table-5: Information exchange

Instructional design procedure	E-moderating	Technical support	
Information exchange	Tutoring and supporting use of learning materials	Searching, personalising software	PEI

4.2.4. Knowledge construction

Knowledge construction is where students make connections between models and work-based learning experiences (Salmon, 2002). Their understanding is improved; they make course-related discussions (conferencing) and apply critical thinking to subject matters. There is highly productive collaboration happening, students become authors than mere information transmitters. The facilitator facilitates the process and guides the students' learning progress, ask questions, gives feedback, and encourages reflections. There is enough interactivity among student, and participation and engagement can be noted from activities.

Table-6: Knowledge construction

Instructional design procedure	E-moderating	Technical support	PEI
Knowledge construction	Facilitating process	Conferencing	

4.2.5. Development

Development entails students becoming more responsible of their own learning through technology-aided medium, and needing little support from the facilitator (Salmon, 2004). Therefore, they may become more demanding and require better access, more software, and may have recommendations for their learning experience. At development, they can link learning with their profession. According to Salmon (2002), the important thing is to design activities that ensure students' independency online and personalisation of their online learning experiences. They have high amount of interactivity and participation in activities, and can engage with any challenge.

Table-7: Development

Instructional design procedure	E-moderating	Technical support	PEI
Development	Supporting, responding	Providing link outside closed conferences	

4.3. Investigative tool

After considering all instructional design procedures and PEI associated with E-moderating and E-learning, the investigative tool was developed for Course-A and Course-B. The tool was used to understand the relationship between instructional design procedures, and determine how online learning instructional design of the two online courses facilitates students' and facilitators' PEI.

Table-8: Investigative tool

Course	Instructional design procedures	Access and motivation	Online socialisation	Information exchange	Knowledge construction	Development	
Course -A, and Course -B	E-moderating	Welcoming and encouraging	Familiarising and providing bridges between cultural, social and learning environments	Tutoring and supporting use of learning materials	Facilitating process	Supporting, responding	PEI
	Technical support (E-learning)	Setting up system and accessing	Sending and receiving messages	Searching, personalising software	Conferencing	Providing link outside closed conferences	

There were two online courses understudy. The first column identifies these courses as Course-A and Course-B. The second column comprised the actions of facilitators and their students in the two courses as influenced by instructional design with its procedures from column three to column seven in online learning. The last column is influenced by what happens from instructional design procedures regarding online facilitating (E-moderating) and E-learning.

4.3.1. Aligning investigative tool

The tool presents PEI that is facilitated in each instructional design procedure associated with E-moderating and E-learning in an online environment. Every action involved in each design procedure by the facilitators and their students is added, and the resulting PEI is determined or measured by these actions.

4.4. Conclusion

The conceptual framework helped in decision making to analyse data and get meaning from the results of the study. Its structure is dependent on Salmon 5-stage framework. This conceptual framework also informs online learning instructional design that facilitates students' and facilitators' PEI for online courses. The findings of this study elaborate on how online learning instructional design facilitates students' and facilitators' PEI for two online courses. The following chapter describes the presentation, and analysis of qualitative data using the above investigative tool (see table-8).

Chapter Five
Data Presentation and Analysis

5.1. Introduction

The purpose of this study was to investigate how online learning instructional design of two online courses offered in a South African university facilitates students' and facilitators' PEI. The researcher used an investigative tool, developed in this study, to investigate the phenomenon on study by an in-depth analysis of individual perceptions and the documents that were shared. In this chapter he discusses facilitators' perceptions on online learning instructional design facilitating PEI for two online courses (interviews analysis and document analysis), determine how online learning instructional design of two online courses facilitates students' and facilitators' PEI (interviews, questionnaires, and document analysis), and students' responses to online learning instructional design in terms of facilitating PEI for two online courses (questionnaires analysis).

The study was performed to review the research questions. It leaned on the conceptual framework developed, which was a simple illustration of how the study envisaged the association of the Salmon's framework for online instructional and curriculum design that facilitates students' and facilitators' PEI. As Laurillard (2002) suggests that learning can be developed through learning activities (actions or tasks), every activity involved in each instructional design procedure by facilitators and their students is considered an act of learning in which PEI could be determined or measured. What the students and their facilitators did for learning provided evidence of PEI which was facilitated by online learning instructional design in this study.

The conceptual framework examines how online learning instructional design facilitates students' and facilitators' PEI for online courses. In this framework learning activities of facilitators and students are expected to enhance PEI. To analyse and interpret results, an investigative tool developed in chapter four was used to investigate instructional design procedures that encompassed E-moderating and E-learning, and the resulting PEI.

5.2. Interviews analysis

The aim of having interviews was to investigate a phenomenon understudy in-depth, and gain insight into facilitators' perspectives and experiences on how online learning instructional design of their online courses facilitates PEI in their university. According to Salmon (2002),

the process of instructional design for online learning involves the facilitators' moderating activities and the students' online learning activities.

5.2.1. Facilitators' perceptions on online learning instructional design facilitating PEI for two online courses

Facilitator-1, Course-A

Facilitator-1 from Course-A explained eagerly the necessity of the instruction developed with the inclusion of learning outcomes. This helps students to direct their learning to something or acquire focus.

> *"...students work effectively and productively in striving to reach the outcomes and working in association with each other"*

Because students have direction or focus due to the learning outcomes, they work effectively and productively and in association with each other. Meaning the design should include outcomes and collaboration for facilitated PEI.

Facilitator-2, Course-B

The core to Course-B instructional design was sharing of skills and resources.

> *"…students collaborate a lot and network with each other, so that they can share skills and resources."*

In order for students to share their skills and resources, there was collaboration (working in association with each other) involved. This implies that the design should influence collaboration for facilitated PEI.

5.3. How online learning instructional design of two online courses facilitates students' and facilitators' PEI (interviews analysis)

The researcher, in this section, discusses how online learning instructional design of the two online courses facilitates students' and facilitators' PEI. However, only the views of facilitators were considered, because at this stage only interviews were reviewed.

5.3.1. Access and motivation

Facilitator-1, Course-A

Facilitator-1 from Course-A provides students with the course learning outcomes, because of this, students are able to do extra work online and understands concepts (or what is expected of them) better.

> *"…outcomes…do extra work online…for better understanding."*

The outcomes encouraged students, because of them students knew what to expect or what is expected of them. Computer-aided learning helped students beyond expectations. Students engaged with the outcome and the system, and participated in online learning. Interaction noted is student-to-material.

Facilitator-2, Course-B

Objectives for students to go by were set. They encouraged students to focus, in their course. Students accessed the system.

> *"I set objectives…online learning and Sakai methods…not everybody can access them."*

To reach the set objectives students needed focus to participate in online learning and be able to survive in an online environment, there was engagement with Sakai and other media, and the students required total participation in online activities. Interaction noted is student-to-material interaction.

Summary of access and motivation

Table-9 provides the summary of *access and motivation* for PEI in Course-A and Course-B instructional design procedure, based on the results from E-moderating and E-learning.

Table-9: Summary of access and motivation for Course-A and Course-B

Course	Instructional design procedure	Access and motivation	PEI
Course-A	E-moderating	Welcoming and encouraging: *Outcomes, better understanding*	Participation: *Work* Engagement: *Outcomes, work*
		Setting up system and accessing:	

	Technical support (E-learning)	*Extra work online*	Interaction: *Work*
Course-B	E-moderating	Welcoming and encouraging: *Set objectives*	Participation: *Learning* Engagement: *Learning, objectives, Sakai* Interaction: *Sakai, learning*
	Technical support (E-learning)	Setting up system and accessing: *Access, online learning, Sakai*	

There was PEI in *access and motivation* for both the courses. The interaction identified was in the form student-to-material.

5.3.2. Online socialisation

Facilitator-1, Course-A

Facilitator-1 believes that online platform assist himself and the students, as students were able to communicate amongst themselves, and work in association with each other. They could send stuff (messages, material) through Sakai, Emails, and WhatsApp. However, some students struggled with acquiring data.

> *"Online platform…assists both myself and students…they communicate amongst themselves…working in association with each other. Send stuff…on Sakai, Emails, WhatsApp. Some of the students struggle with data."*

This implies that facilitator-1 created familiarisation by uniting students through team work. Students exchanged material, even though some struggled to acquire data. There was enough amount of interactivity, students participated in groups and activities, and were engaged in learning by exchanging messages or material through online media.

Facilitator-2, Course-B

Students from Course-B collaborated and networked with each other. They were encouraged on having learning communities (groups), via media such as WhatsApp, Teams, and Sakai. Students were helped to realise they were in the same situation together. Some struggled with internet access, even though their facilitator strived for inclusion in education. He believed learning should include every student.

> *"I like students to collaborate a lot and to network with each other. I also like having groups…on WhatsApp, Teams (for meetings or sessions), and of course our platform*

Sakai. I often tell my students that they are a team and they all do the same things, so they might as well collaborate and learn from one another…Some struggled with very basic issues including internet access…we haven't made enough effort to equalise that gap between students who have had and still have access to technological tools and online resources, and those who don't. This exacerbates the inequality among students and it shouldn't be so…I believe in inclusion in education. Inclusion is a very big part of how I understand teaching and learning."

Familiarisation was created through collaboration. Students participated by sending and receiving messages from each other, and were engaged in group sessions. There was interaction as students could communicate with peers, and their facilitator.

Summary of online socialisation

Table-10 provides the summary of *online socialisation* for PEI in Course-A and Course-B instructional design procedure, based on the results from E-moderating and E-learning.

Table-10: Summary of online socialisation for Course-A and Course-B

Course	Instructional design procedure	Online socialisation	PEI
Course-A	E-moderating	Familiarising: *Working in association with each other*	Participation: *Work, send, in association with each other, not getting data* Engagement: *Work, outcomes, Emails, WhatsApp, Sakai, not getting data* Interaction: *Work, communicate, send, Emails, WhatsApp, Sakai, in association with each other, not getting data*
	Technical support (E-learning)	Sending and receiving messages: *Communicate amongst themselves, send stuff, Emails, WhatsApp, Sakai, not getting data*	
Course-B	E-moderating	Familiarising: *They all do the same things, collaborate, network with each other*	Participation: *Collaborate, groups, not getting internet access or data* Engagement: *WhatsApp, Teams, Sakai, not getting internet access or data* Interaction: *Collaborate, groups, WhatsApp, Teams, Sakai, not getting internet access or data*
	Technical support (E-learning)	Sending and receiving messages: *Having groups, WhatsApp, Teams, Sakai, not getting internet access or data*	

There were grievances about internet access or "*data"* acquisition for learning, which causes other students to be excluded if not acquired for both the courses. Facilitators were aware of the inequalities that are associated with students' socioeconomic backgrounds and challenges that may lead to unequal access to learning experiences.

There was PEI in *online socialisation* for both the courses. Students were helped to realise that they had a base of people to communicate with and be supported by, as they engaged in learning process. PEI is facilitated through collaboration that is promoted by the facilitators for both courses.

5.3.3. Information exchange

Facilitator-1, Course-A

Students in Course-A could reach set outcomes. They personalised their learning, they did simulations, uploaded slides and recorded videos through Sakai, Emails, and WhatsApp, and they went extra miles doing their activities using online tools. Discussions were mostly done on WhatsApp.

> *"Online platform…assists students to reach set outcomes…they are able to do extra work online…Simulations, uploading…slides, recorded videos… through Sakai, Emails, WhatsApp. Mostly discussions "we" do via WhatsApp."*

Information was shared using online tools (media). The students engaged in activities, became independent, confident, and were passionate about working online to the extent that, when given tasks, they would do extra work. They participated in discussions, and as they do, interacted with each other, facilitator, and material.

Facilitator-2, Course-B

The facilitator conducted lessons, issued activities, and shared information through Sakai, Emails, WhatsApp, and Teams. Students did assignments, presentations, and summaries well. A lot was done in an online environment, including having discussions, and sharing knowledge and material.

> *"I conduct lessons with my students and post activities for them…using; Emails, WhatsApp, teams (for meetings or sessions), and Sakai. They do assignments well…presentations, and making summaries. It's a lot "we" do online…and learn from one another…students have discussions."*

Students became articulate, activities were done well. They interacted together with their facilitator, and the materials. They engaged with online tools and in activities. They also participated in meetings, sessions, and discussions.

Summary of information exchange

Table-11 provides the summary of *information exchange* for PEI in Course-A and Course-B instructional design procedure, based on the results from E-moderating and E-learning.

Table-11: Summary of information exchange for Course-A and Course-B

<table>
<tr><th>Course</th><th>Instructional design procedure</th><th>Information exchange</th><th>PEI</th></tr>
<tr><td rowspan="2">Course-A</td><td>E-moderating</td><td>Tutoring and supporting use of learning materials:
Assists students to reach set outcomes, Sakai, Emails, WhatsApp, encourages discussions</td><td rowspan="2">Participation:
Discussions, work

Engagement:
Outcomes, Sakai, Emails, WhatsApp, work, uploading, videos, slides, Simulations

Interaction:
Sakai, Emails, WhatsApp, discussions, work</td></tr>
<tr><td>Technical support (E-learning)</td><td>Searching, personalising software:
Do extra work online, Simulations, discussions, uploading, slides, recording, videos, Sakai, Emails, WhatsApp</td></tr>
<tr><td rowspan="2">Course-B</td><td>E-moderating</td><td>Tutoring and supporting use of learning materials:
conduct lessons, post activities, meetings, sessions, learn from one another, Emails, WhatsApp, Teams, Sakai</td><td rowspan="2">Participation:
Lessons, post, meetings, sessions, learn from one another, discussions, activities,

Engagement:
Lessons, post, sessions, Emails, WhatsApp, Teams, Sakai, activities

Interaction:
Lessons, meetings, sessions, learn from one another, Emails, WhatsApp, Teams, Sakai, discussions, activities</td></tr>
<tr><td>Technical support (E-learning)</td><td>Searching, personalising software:
Lessons, meetings, sessions, discussions, learn from one another, activities, do assignments well, presentations, making summaries, Emails, WhatsApp, Teams, Sakai</td></tr>
</table>

There was PEI in *information exchange* for both the courses. The students became independent, confident, and were passionate about working online.

5.3.4. Knowledge construction

Facilitator-1, Course-A

Every member could pose questions in *knowledge construction*. Students' level of understanding was high, they created meaningful conversations, their collaboration was productive, and they did work more effectively toward accomplishing learning outcomes.

> *"…students access content easily, and they understand the lessons as they communicate amongst themselves. We pose questions…Students work effectively and productively…striving to reach the outcomes and working in association with each other."*

When Facilitator-1 was asked about how he perceives feedback, he highlighted the fact that it promotes interaction and should be given as soon as marking was done. In addition to that, he sequenced the manner of carrying out the instruction. Denoting that the course has been structured following specific learning pathway; from acquired knowledge, to activity, feedback, and then reflection or review, towards achieving learning outcomes or objectives.

> *"Feedback can be interaction, because I'd explain to students where they went wrong and they'd be asking questions to clarify misconceptions…I firstly introduce a topic, then give activities to check understanding and I can now give feedback so that students may reflect or make self (peer)-reviews and corrections."*

Learner isolation was encountered in Course-A, and Facilitator-1 linked it to socioeconomic challenges.

> *"There is learner isolation, some of the students struggle with data. I don't really solve it…"*

Students were more active in this stage. This has led to the discovery that some students were actually not coping. However, most students participated in activities, there was engagement with materials and in the whole learning process, and everybody could interact with someone or materials.

Facilitator-2, Course-B

There was question and answer sessions in Course-B. Students could apply critical thinking to subject matters because they were able to make inquiries and suggestions. However,

Facilitator-2 complained about the big number of students in his online class, which might be the source of students' frustration, and ineffective interactions.

> *"We do online…question and answer, inquiries and suggestions. Students collaborate and learn from one another…Classes have gone bigger, university is accepting more and more postgraduates. Because of the bigger number…the interactions are not so effective…it take time to reach individuals with problems."*

When Facilitator-2 was asked about how he perceives feedback, he linked it with interaction, and attested that feedback is important for students to monitor progress and for improvement. It should be given within reasonable time.

> *"Feedback is a very important aspect of interaction especially at postgraduate level, because it helps students to monitor their own progress and make improvements where needed. It gives them an idea of what actually is wanted of them."*

Learner isolation was also identified in Course-B. According to Facilitator-2, learners who felt isolated don't respond to anything, and it is hard to identify them until their participation is closely monitored. Often times they are left behind if they cannot cope. Because Facilitator-2 mentioned a big class that was affecting interaction, and him taking long to reach individuals with problems, it is evident that not only socioeconomic challenges cause learner isolation, also class conditions.

> *"…when learners feel isolated "they" don't respond. You become not aware until you closely monitor their participation, they simply don't respond regardless of your trying or efforts. This is a very difficult situation because I think it is up to the student to contact us if they start feeling "somewhat" of the teaching and learning…At times it is up to individuals to sort themselves or they become left behind, and I don't like that ideology of some students being left behind but little can be done…"*

There was enough interactivity concerning student, participation and engagement could be noted from the activities.

Summary of knowledge construction

Table-12 provides the summary of *knowledge construction* for PEI in Course-A and Course-B instructional design procedure, based on the results from E-moderating and E-learning.

Table-12: Summary of knowledge construction for Course-A and Course-B

Course	Instructional design procedure	Knowledge construction	PEI
Course-A	E-moderating	Facilitating process: *Communicate, feedback, explain, clarify misconceptions, check understanding*	Participation: *Lessons, work, reflect, corrections, collaboration, feedback, learner isolation* Engagement: *Explain, clarify, check, access, lessons, work, outcomes, questions, reflect, corrections, feedback, learner isolation* Interaction: *Communicate, access, lessons, work, feedback, questions, collaboration, reflect, learner isolation*
	Technical support (E-learning)	Conferencing: *Access content easily, understand the lessons, communicate, work effectively and productively, striving to reach the outcomes, feedback, questions, reflect, corrections, working in association with each other, learner isolation*	
Course-B	E-moderating	Facilitating process: *Question and answer, suggestions, feedback, closely monitor, big class size*	Participation: *Collaborate, reflection, improvements, feedback, big class size, learner isolation* Engagement: *Question and answer, suggestions, monitor, inquiries, improvements, feedback, reflection, learner isolation* Interaction: *Question and answer, feedback, inquiries, collaborate, reflection, big class size, learner isolation*
	Technical support (E-learning)	Conferencing: *Inquiries and suggestions, collaborate and learn from one another, monitor their own progress, feedback, make improvements, big class size, learner isolation*	

There was learner isolation in both the courses. Facilitator-2 viewed class size as a hindrance to effective interaction that would lead to learner isolation. Both facilitators were aware of the inequalities that were associated with students' socioeconomic backgrounds and challenges that may lead to unequal access to learning experiences, and Facilitator-1 linked this with learner isolation in his course.

There was PEI in *knowledge construction* for both the courses. Students' understanding improved for both courses; they made course-related discussions (conferencing), and applied

critical thinking to subject matters. There was highly productive collaboration happening. The facilitators facilitated the process and guided the students' learning progress, gave feedback, and encouraged reflection. Feedback and reflection were important aspects in instructional design for this study, they housed all the three elements (PEI).

5.3.5. Development

Facilitator-1, Course-A

Facilitator-1 was not much involved in students' activities. His class did discussions on WhatsApp.

> *"My participation is…less, because some of the discussions we do them through WhatsApp."*

Through discussions students were able to participate, engage with content, and interact.

Facilitator-2, Course-B

Facilitator-2's involvement was also minimum, and WhatsApp was recommended for matter of importance.

> *"My participation is…minimum…I always try to accommodate everyone by creating other…platforms like WhatsApp."*

Students' could participate on WhatsApp, interact with each other, and engage any matter of concern.

Summary of development

Table-13 provides the summary of *development* for PEI in Course-A and Course-B instructional design procedure, based on the results from E-moderating and E-learning.

Table-13: Summary of development for Course-A and Course-B

Course	Instructional design procedure	Development	PEI
Course-A	E-moderating	Supporting, responding: *Participation is less, discussions, WhatsApp*	Participation: *Discussions* Engagement: *WhatsApp* Interaction: *WhatsApp, discussions*
	Technical support (E-learning)	Providing link outside closed conferences: *Discussions, WhatsApp*	

Course-B	E-moderating	Supporting, responding: *Participation is minimum, accommodate everyone, WhatsApp*	Participation: *Accommodate everyone* Engagement: *WhatsApp* Interaction: *WhatsApp, accommodate everyone*
	Technical support (E-learning)	Providing link outside closed conferences: *WhatsApp*	

There was PEI in *development* for both the courses. Facilitators' involvement was low. However, *development* could not be tackled in depth as there was nothing from interviews' data showing students were developed at this stage.

5.4. Questionnaires analysis

The aim of having questionnaires (unstructured) was for the students to provide more details expressed in their own words about the phenomenon on study. Facilitators' moderating activities and the students' E-learning activities were considered for the process of instructional design. Trueman (2015) stated that unstructured questionnaires provides more valid data for qualitative research.

5.4.1. Frequencies in the study

The frequencies of students' responses from Course-A and Course-B is provided in frequency table shown as figure-6. This figure validates frequencies that are categorised according to the meaning of *"what each question was about"* in the questionnaire. It helped in the development of frequency diagram. Erickson (2012) mentioned that it is needed in qualitative research to specify frequencies through display of frequency tables if numbers were used. The frequencies used, relate to number of times a certain response or experience emerged.

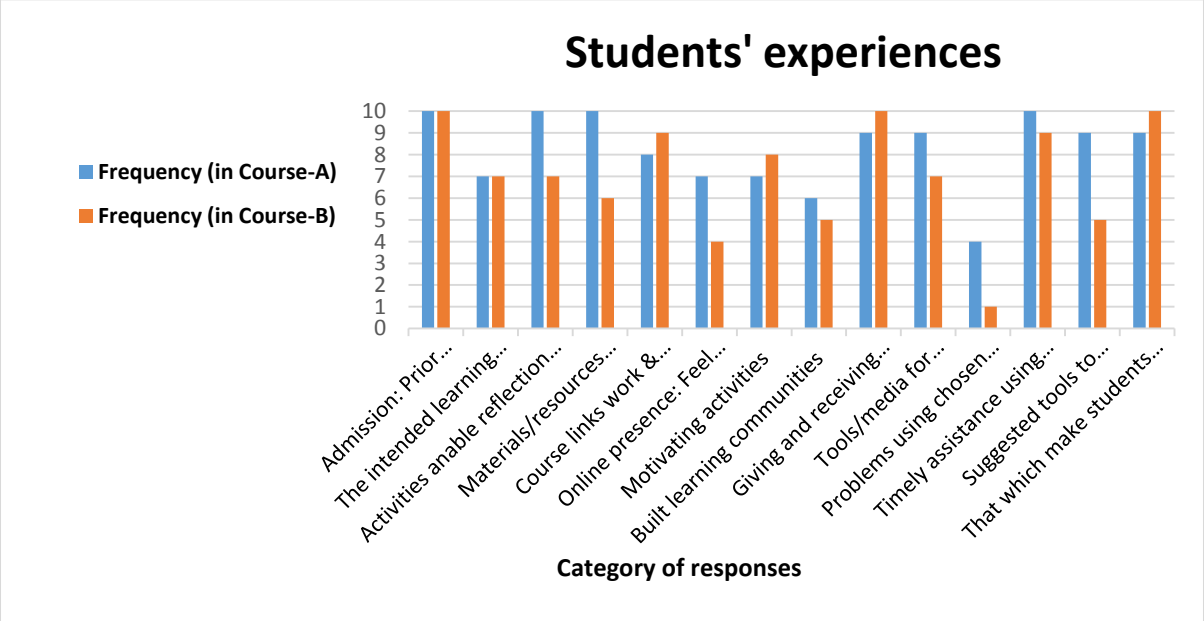
Figure-6: Frequency validation of categories

Question	Category of response	Frequency (in Course A)	Frequency (in Course B)	Exemplar
1	Admission: Prior knowledge, Qualification, Average pass	10	10	"I needed to have an undergrad degree before I could do this qualification." "...with average pass above 65%, ...technology background. "
2	The intended learning outcomes stated & clearly defined	7	7	"...before the course begins we are sent an outline." "...course outline states clearly the learning outcomes and the assessment criteria."
3	Activities anable reflection on own learning	10	7	"...my work receives feedback which helps me reflect on my work and how I can improve on it."
4	Materials/resources stimulate learning	10	6	"We are always learning something new, I find materials relevant...challenges my thinking and broadens my perspective." "...tutorials and assignments enforce work covered."
5	Course links work & profession (professional development)	8	9	"...contributes to my professional development, helps me to stay in touch with educational policies, prepares me well for teamwork and presentation skills...which are essential in the working environment."
6	Online presence: Feel isolated/others dominating	7	4	"There are people with extroverted or assertive personalities that tend to dominate...quieter people become sidelined or shy to express their opinion."
7	Motivating activities	7	8	"...interaction and discussion." "...practicals where I get to put to practice what I have learned."
8	Built learning communities	6	5	"We have WhatsApp groups and are very involved in communicating and helping each other."
9	Giving and receiving feedback from facilitator to student, and student to student	9	10	"We have SAKAI." "...Emails." "...WhatsApp and use Microsoft teams." "...assignments are graded and feedback on the assignment is provided."
10	Tools/media for participation, interaction, & engagement	9	7	"1. & 3. Sakai, MS Teams, ...2. WhatsApp group chats, MS Teams, sometimes even via emails."
11	Problems using chosen technological tools/media above (in 10)	4	1	"Online classess are not always reliable. I spend the maximum of 10 minutes trying to connect, and then during the call, the network may not be strong enough..."
12	Timely assistance using technologies is from Facilitator,colleagues & support service	10	9	"There has been good support when technicalities delay submissions for test/assignments..." "...I am usually helped quickly by either the lecturer, or peers..."
13	Suggested tools to additionally use for interaction, participation, and engagement	9	5	"...media platforms allowing more live "teaching" - eg virtual blackboards..." "...Virtual whiteboards." "...Ms Teams to offer live lectures."
14	That which make students remain studying or stay focused in this course	9	10	"Motivation to obtain my qualification." "...content is interesting." "...deadlines. Desire to improve my knowledge." "...getting into masters..."

Activate Windows
Go to PC settings to activate Windows.

The frequency diagram in figure-7 below, presents frequencies of students' responses to questionnaire questions. It shows how many students in each sample from both the courses gave similar responses for question 1 up to question 14 of the questionnaire.

Figure-7: Frequency diagram



The students from both Course-A and Course-B shared their experiences, and these experiences were categorised as shown in figure-7. This diagram was mainly used as referral point during analysis of students' responses. It made analysis simpler because responses were categorised, and thus manageable.

5.4.2. Students' responses to online learning instructional design in terms of facilitating PEI for two online courses

Course-A

The entire sample or 10 students (see figure-7) testified that the course materials or resources stimulated their learning. Some of the students are quoted below:

> *"I am interested in the content that enables us to communicate,"* Student-2.
>
> *"Tutorials and assignments enforces the work covered in class,"* Student-5.
>
> *"…engaging with the material helps me have a better understand of what I am working towards…,"* Student-6.

Because the course materials stimulated learning, students iterated with the content and amongst themselves. They engaged with content.

Tools or media that students used in Course-A for PEI include; Sakai, Emails, Team, and search engines (Google scholar).

These tools or media made PEI possible, because students could interact, participate in group discussions, and engage in online class sessions. Support, if needed, was received from support service, facilitator, and peers in the course.

> *"There has been good support when technicalities delay submissions for tests or assignments from support service,"* Student-1.
>
> *"Most problems…solved by asking other students on WhatsApp group…,"* Student-8.
>
> *"…our facilitator, otherwise we are usually required to explore other sources like the internet, forums, and each other…,"* Student-10.

There was productive interaction in Course-A, whereby participants interacted, and supported each other.

In a nutshell, to facilitate PEI, students communicated, reviewed tutorials, did assignments, and issued or received assistance. They also used technologies like Sakai, Emails, Team, and search engines.

Course-B

Six students in Course-B (see figure-7) attested that materials stimulated their learning. The following students supported:

> Student-1, *"it enables further reading and study."*
>
> Student-6, *"...relevant to the work, which I do at work, so it makes it easier to understand."*

Students engaged with the readings to participate in learning. The way the instruction was designed enabled them to link work with profession. They used WhatsApp to participate in groups and for interaction.

Other tools or media that the students used for PEI include; Microsoft Teams, Zoom, WhatsApp, Google Drives and Emails, Sakai, and the internet. Student support was given by support service, peers, and the facilitator, even though majority appeared not to have technical problems.

> *"All…parties (support service, peers, and facilitator) help,"* added Student-9.
>
> *"I have not encountered problems using technologies in the course,"* Student-10.

Couse-B enabled participation for group work, students were involved in readings, they issued or received help, and they linked work and profession. They used Microsoft Teams, Zoom, WhatsApp, Google Drives and Emails, Sakai, and the internet to facilitate PEI.

5.5. How online learning instructional design of the two online courses facilitates students' and facilitators' PEI (questionnaires analysis)

This section discusses how online learning instructional design of the two online courses facilitates students' and facilitators' PEI. However, only the views of students were considered, because at this stage only questionnaires were reviewed.

5.5.1. Access and motivation

Course-A

Students needed to have an undergraduate degree and some sort of prior knowledge in technology before they could be admitted into this course. Because this course was conducted online, having technology background was handy and motivated the students. 10 students (see figure-7) said prior knowledge was required. Seven students also attested that learning outcomes were stated and clearly defined.

> *"65% average pass for my B.Ed undergraduate degree plus some knowledge of technology…needed,"* Student-3.
>
> *"…good outlines and marking rubrics…learning outcomes stated and clearly defined,"* Student-4.
>
> *"…the course outline states clearly the learning outcomes and the assessment criteria to be used for student evaluation,"* Student-7.

Outcomes, prior knowledge, and assessment criteria encouraged students to be focused, students knew what was expected of them. To reach learning outcomes, students needed focus to participate in online learning and be able to survive in an online environment. There was engagement with Microsoft Teams and other media to access lectures and online materials. Interaction noted was student-to-material interaction.

Course-B

Prior knowledge was also required in Course-B before students could be admitted. Prior knowledge made students to realise their potentials, it was enough motivation that they could make it. Therefore, a mere fact that they had what the university required, it was an encouragement. Seven students testified that objectives or outcomes were stated at the beginning of every lecture, and most of the information was explained on the system. They used Sakai and YouTube videos for learning.

> *"For every lecture, the objectives are stated at the beginning,"* Student-4.
>
> *"…Sakai. Resources on the internet; mainly YouTube videos has been the main way I interact with learning content,"* Student-8.

The objective or outcomes encouraged students, because students knew what to expect or what is expected of them. Computer-aided learning helped students beyond expectations. Students engaged with the outcome and the system, and participated in online learning. Interaction noted was student-to-material.

Summary of access and motivation

Table-14 provides the summary of *access and motivation* for PEI in Course-A and Course-B instructional design procedure, based on the results from E-moderating and E-learning.

Table-14: Summary of access and motivation for two courses

<table>
<tr><th>Course</th><th>Instructional design procedure</th><th>Access and motivation</th><th>PEI</th></tr>
<tr><td rowspan="2">Course-A</td><td>E-moderating</td><td><u>Welcoming and encouraging</u>:
Good outlines, marking rubrics, learning outcomes</td><td rowspan="2"><u>Participation</u>:
Write, submitting

<u>Engagement</u>:
Outlines, marking rubrics, outcomes, prior knowledge, Teams, write, submitting, computers, access, cameras, recorders

<u>Interaction</u>:
Teams, computers, access, rubrics</td></tr>
<tr><td>Technical support (E-learning)</td><td><u>Setting up system and accessing</u>:
Average pass, undergraduate degree, knowledge of technology, Microsoft Teams, write, submitting, computers, access online materials, cameras for videos and pictures, recorders for sound</td></tr>
<tr><td rowspan="2">Course-B</td><td>E-moderating</td><td><u>Welcoming and encouraging</u>:
Objectives are stated, explained on the internet</td><td rowspan="2"><u>Participation</u>:
Downloading or viewing YouTube videos

<u>Engagement</u>:
Objectives, internet, prior knowledge, Sakai, resources, YouTube videos

<u>Interaction</u>:
Internet, Sakai, resources</td></tr>
<tr><td>Technical support (E-learning)</td><td><u>Setting up system and accessing</u>:
Undergraduate degree, Sakai, resources on the internet, YouTube videos</td></tr>
</table>

There was PEI in *access and motivation* for both the courses. The interaction identified was in the form student-to-material.

5.5.2. Online socialisation

Course-A

Six students said that the facilitator advised them to build learning communities. Students were able to communicate amongst themselves, and work in association with each other. They expressed their feelings towards their Course. They could send messages through Sakai, Emails, and WhatsApp. However, some students struggled with acquiring data.

> *"I love it and study it with the intention to go out there and practice in the long run,"* Student-4.
>
> *"…is exciting. You learn enough about everything…,"* Student-9.
>
> *"…we have WhatsApp groups and are very involved in communicating and helping each other,"* Student-1.
>
> *"…course…designed in such a way that we have to work with partners…is an encouragement to liaise with other students. It helps to know…we are in this situation together… share our learning experiences and assist one another,"* Student-10.
>
> *"…post…on Sakai or send…via email,"* Student-5.
>
> *"Peers, depending if you have enough…data or minutes…can call you…,"* Student-7.

This implies that the facilitator of Course-A created familiarisation by uniting students through group work. Students exchanged Emails or messages, even though some struggled to acquire data. There was enough amount of interactivity, students participated in groups and activities, and they engaged in learning by exchanging messages or material through online media. Collaboration made students establish an environment where all feel respected for being in the same situation.

Course-B

Students from Course-B collaborated and worked with each other. They were encouraged on building learning communities via WhatsApp, and communicated also by Email. Students were helped to realise they were in the same situation together. Some struggled with internet or network access. Students sent and received messages. Some of them testified that they like to collaborate a lot, and some also shared their feelings. Five students said that the facilitator advised them to build learning communities.

> *"Facilitator…has been helpful, he created a WhatsApp group for his students…,"* Student-3.

"…group work is encouraged a lot, as most of the assignment are group work…," Student-5.

"…I enjoy working with people because… of collaborative work…," Student-7.

"…And send messages or Emails to one another," Student-8.

"…network problems and no assistance is provided…," Student-10.

Familiarisation was created through collaboration. Students participated by sending and receiving messages from each other, and were engaged in group sessions. There was interaction as students could communicate with peers, and their facilitator. Students could also express their views or feelings at this stage.

Summary of online socialisation

Table-15 provides the summary of *online socialisation* for PEI in Course-A and Course-B instructional design procedure, based on the results from E-moderating and E-learning.

Table-15: Summary of online socialisation for two courses

Course	Instructional design procedure	Online socialisation	PEI
Course-A	E-moderating	Familiarising: *divides us into groups, encouragement*	Participation: *Groups, study, collaboration, partners, activities, post, send, not getting data* Engagement: *Study, WhatsApp, activities, post, Email, not getting data* Interaction: *Groups, study, WhatsApp, communicating, collaboration, partners, activities, send, Email, not getting data*
	Technical support (E-learning)	Sending and receiving messages: *I love it and study it, is exciting, learn enough, WhatsApp groups, very involved, communicating, helping each other, partners, group activities, post, send, Email, not getting data*	
Course-B	E-moderating	Familiarising: *Help, encourage*	Participation: *Help or collaboration, group, assignment, send, not getting data* Engagement: *Encourage, WhatsApp, assignment, Emails, not getting data*
	Technical support (E-learning)	Sending and receiving messages: *WhatsApp group, group work, enjoy working with people, assignment, collaborative work, send*	

		messages, Emails, not getting data	Interaction: *collaboration, WhatsApp, group, assignment, send, messages, Emails, not getting data*

There were grievances about internet access or "*data"* acquisition for learning, some students could not afford data charges. This brings about, the awareness of the inequalities that are associated with students' socioeconomic backgrounds and challenges that may lead to unequal access to learning experiences.

There was PEI in *online socialisation* for both the courses. Students were helped to realise that they had a base of people to communicate with and be supported by, as they engaged in learning process. In both courses, students PEI was facilitated through collaboration that was promoted by the facilitators with media.

5.5.3. Information exchange

Course-A

Students in Course-A were striving to reach outcomes. They personalised their learning, they made discussions, and had group-chats. They used technology including; Sakai, Emails, Microsoft Teams, and WhatsApp, and they went extra miles using online tools and the internet.

> *"Outcomes are displayed in each course outline and reemphasized during lectures,"* Student-3.
>
> *"…outlines and marking rubrics,"* Student-6.
>
> *"…variety of resources are provided on top of the prescribed textbooks…other resources are available on the internet, and E-libraries are highly encouraged…,"* Student-8.
>
> *"Email with comments - very helpful,"* Student-9.
>
> *"…peer discussions have been very helpful for understanding,"* Student-4.
>
> *"We have Sakai. Our facilitator gives weekly announcements on the website…,"* Student-7.
>
> *"We have a group-chat on WhatsApp and use Microsoft Teams…,"* Student-10.

Information was shared using online tools or media. The students engaged in activities, became independent, confident, and were passionate about working online to the extent that, when given tasks, they would not hesitate to consult extra resources from the internet. They participated in discussions, and as they do, interacted with each other, facilitator, and material. Facilitator organised activities, assigned responsibilities though course outline, supported use of learning materials, encouraged discussions, developed rubrics, and summarises outcomes for the students.

Course-B

The facilitator conducted lectures and issued activities like presentations. Sharing of information was through Sakai, Emails, telephone calls, and WhatsApp. Students did activities, created online meetings and they communicated with one another. A lot was done in online environment, including having discussions, and sharing knowledge or resources.

> *"For every lecture, the objectives are stated at the beginning of the presentation…,"* Student-1.
>
> *"…information is explained on the internet or Sakai,"* Student-5.
>
> *"After going through the lecture slides or presentations on internet, I go straight to doing the week's activity,"* Student-6.
>
> *"We communicate via emails and set up meetings on digital platforms…,"* Student-8.
>
> *"…use WhatsApp groups to communicate,"* Student-9.
>
> *"…discussions: Emails and telephone calls and WhatsApp discussions,"* Student-10.

Students interacted together, with their facilitator, and material. They engaged with online tools and in activities. They also participated in meetings, lectures, and discussions. Facilitator facilitated, organised activities, prepared the slides, and presentations. He assigned responsibilities, supported use of learning materials, encouraged discussions, and summarised outcomes or objectives for students.

Summary of information exchange

Table-16 provides the summary of *information exchange* for PEI in Course-A and Course-B instructional design procedure, based on the results from E-moderating and E-learning.

Table-16: Summary of information exchange for two courses

Course	Instructional design procedure	Information exchange	PEI
Course-A	E-moderating	Tutoring and supporting use of learning materials: *Outcomes re-emphasized, displayed, course outline, marking rubrics, provided resources, encouraged internet resources and E-libraries, website, comments, Email, announcements, Sakai*	Participation: *Comments, discussions, group* Engagement: *Outcomes, display, course outline, rubrics, resources, encourage, E-libraries, website, announcements, Email, Sakai, Teams, WhatsApp, textbooks, resources* Interaction: *Rubrics, resources, E-libraries, website, announcements, Email, Sakai, comments, Teams, WhatsApp, textbooks, resources, discussions, chat, group, meetings*
	Technical support (E-learning)	Searching, personalising software: *Sakai, Emails, Microsoft Teams, WhatsApp, textbooks, internet resources, E-libraries, discussions, website, group-chat*	
Course-B	E-moderating	Tutoring and supporting use of learning materials: *Objectives, lecture, information, internet, explain, issues slides, Sakai, Emails,*	Participation: *Lecture, explain, Presentation (activity), groups, discussions* Engagement: *Objectives, lecture, information, internet, slides, Sakai, Emails, presentation, WhatsApp, platforms* Interaction: *Lecture, internet, slides, Sakai, Emails, presentation, telephone calls, WhatsApp, communicate, meetings, platforms, groups, discussions*
	Technical support (E-learning)	Searching, personalising software: *Presentation, internet, Sakai, Emails, telephone calls, WhatsApp, go through slides, activity, communicate, meetings, digital platforms, groups, discussions*	

There was PEI in *information exchange* for both the courses. The students became independent, confident, and were passionate about working online.

5.5.4. Knowledge construction

Course-A

The main thing facilitator did at this level was facilitating learning process. Students' level of understanding was high, they created meaningful discussions, and their collaboration was productive. 10 students attested that activities enabled them to reflect on their work. Some students felt that it was intimidating to receive their feedback in large groups. However, feedback promoted improvement and interaction, for example, students communicated, worked in groups, and created peer discussions. They received feedback in the form of written comments, marks, and graded rubrics within reasonable time. This was through, Sakai or its discussion forums, Teams or its sessions, and Emails or on assessments. Nine students testified that, in some point, they had given or received feedback.

> *"We get comments back…so we can see where to improve,"* Student-2.
>
> *"…my work receives feedback which helps me reflect on my work and how I can improve on it,"* Student-3.
>
> *"…peer discussions have been very helpful for understanding,"* Student-4.
>
> *"Emailed comments helped me…,"* Student-6.
>
> *"…written feedback via Sakai or comments on the particular document submitted or online. But mostly, the MS Teams lectures are when most of the feedback sessions take place…it is daunting when feedback is taking place in large groups but you eventually feel comfortable because it's about learning and understanding not simply having the perfect answer,"* Student-7.
>
> *"Marks to assessments are usually sent out…and when they're ready…,"* Student-9.
>
> *"We receive feedback in the form of a marked rubric with rating as well as a commented… copy of the work that we produce,"* Student-10.

Learner isolation was encountered in Course-A. Seven students experienced learner isolation or believed others to be isolated (see "online presence" in figure-7). Some of the students already mentioned that they felt intimidated by receiving feedback in a crowd. Some others said:

"Isolation happens during technical issues…when certain students experience…difficulties when the rest of the class carries on during the online class. That discourage students as they are excluded in class participation…," Student-1.

"Lack of confidence…others are over powering in terms of character," Student-5.

"…in activities like debates and discussions I find myself overwhelmed and isolated by the more vocal participants of my group. Same effect also is experienced during teamwork activities," Student-8.

The issues of isolated learners were a result of technology, lack of confidence, and dominance by others. Students participated in activities, there was engagement with materials and in the whole learning process, and everybody could interact with someone and materials. Students were more active in this section, and this has led to the discovery that some students were actually feeling isolated.

Course-B

There was question and answer sessions in Course-B. Students could apply critical thinking to subject matters because they could give and receive constructive criticism from each other. Every work or activity that they do was for understanding and improvement. Seven students attested that activities enabled them to reflect on their work. Feedback was linked to interaction, it helped students to see where they went wrong and where they should improve. Students received verbal and written feedback within reasonable time, through Sakai, WhatsApp, group conference calls, Email, and on assignment that had comments or that were graded (rubrics). 10 students testified that, in some point, they had given or received feedback.

"…we record the class sessions so that one can go back and reflect…," Student-3.

"Feedback is important - verbal is usually sufficient. It contributes to learning by shaping one's understanding of the issues and approach to problems," Student-4.

"Sometimes the course assignments are graded and feedback on the assignment is provided…facilitator provides feedback from general group conference calls. Student groups mostly use WhatsApp groups to communicate," Student-6.

"Feedback from assignments is provided when marks are issued out. It is helpful as it makes you see where you went wrong and where you can improve," Student-7.

"Feedback…either vocally or electronically…constructive criticism," Student-8.

"I usually interact with other students whereby we ask each other questions. That has helped in stimulating my learning," Student-9.

"Feedback is through Email or Sakai," Student-10.

Learner isolation was also identified in Course-B. According to students, learners who felt isolated do not take part in activities, and this put pressure on the team.

"There are people with extroverted or assertive personalities that tend to dominate (especially if they don't stop talking); in that case, quieter people can become side-lined or shy to express their opinion. Also technology plays a bigger part," Student-5.

"…some students…do not take part in the group activities which places strain on the rest of the team," Student-1.

Isolation for Course-B was influenced by dominance of some students over others, technology, and lack of confidence or shyness. Four students experienced learner isolation or noted others feeling isolated (see "online presence" in figure-7). There was enough interactivity amongst the students, and participation and engagement could be noted from the activities.

Summary of knowledge construction

Table-17 provides the summary of *knowledge construction* for PEI in Course-A and Course-B instructional design procedure, based on the results from E-moderating and E-learning.

Table-17: Summary of knowledge construction for two courses

Course	Instructional design procedure	Knowledge construction	PEI
Course-A	E-moderating	Facilitating process: *Gives feedback, comment, Email, help, Sakai, Teams, lectures, sessions, gives marks, rubric*	Participation: *Comment, collaboration, lectures, sessions, discussions, reflect, submit, groups, assessments, feedback, absence of technology of its skills, lack of confidence, dominance by others, intimidated by receiving feedback in a crowd, learner isolation* Engagement: *Email, Sakai, Teams, lectures, sessions, rubric, submit, answer,*
		Conferencing: *Receives feedback, improve, comment, reflect, discussions, understand, Email, help, Sakai, submit, online, Teams, sessions, groups, answer, receive marks, assessments, rubric, teamwork, activities, absence of technology of its skills,*	

	Technical support (E-learning)	*lack of confidence, dominance by others, intimidated by receiving feedback in a crowd, learner isolation*	*assessments, reflect, feedback, absence of technology of its skills, learner isolation* Interaction: *Feedback, Email, Sakai, Teams, collaboration, lectures, sessions, marks, rubric, discussions, reflect, groups, answer, assessments, absence of technology of its skills, lack of confidence, dominance by others, learner isolation, intimidated by receiving feedback in a crowd*
Course-B	E-moderating	Facilitating process: *Conduct sessions, gives feedback, provides, conference calls, communicate, issues, questions,*	Participation: *Sessions, conference, activities, reflect, group, feedback, absence of technology of its skills, lack of confidence (shyness), dominance by others, learner isolation* Engagement: *Sessions, questions, activities, recordings, WhatsApp, criticism, ask, questions, Email, Sakai, feedback, reflect, absence of technology of its skills, learner isolation* Interaction: *Sessions, feedback, conference, calls, communicate, questions, activities, reflect, marks, group, WhatsApp, communicate, ask, questions, Email, Sakai, absence of technology of its skills, lack of confidence (shyness), dominance by others, learner isolation*
	Technical support (E-learning)	Conferencing: *Activities, understand, coursework, record, sessions, reflect, receives feedback, graded, assignments, group, conference calls, WhatsApp, communicate, marks, improve, constructive criticism, ask, questions, Email, Sakai, absence of technology of its skills, lack of confidence (shyness), dominance by others, learner isolation*	

There was learner isolation in both the courses. The issues of isolated learners in Course-A were a result of technology, lack of confidence, and dominance by others. Some of the students mentioned that they felt intimidated by receiving feedback in a crowd.

In Course-B, the issues for isolation were; dominance by others, technology, and lack of confidence or shyness. With technology, because it was unclear how it contributed to isolation, the researcher assumed it belongs to inequalities that are associated with students' socioeconomic backgrounds and challenges that lead to unequal access to learning experiences.

There was PEI in *knowledge construction* for both the courses. Students' understanding improved; they make course-related discussions (conferencing), and apply critical thinking to subject matters. There was productive collaboration that took place. The facilitators facilitated the process and guided the students' learning progress, gave feedback, and encouraged reflections. Feedback and reflection were important aspects in instructional design for this study, they housed all the three elements (PEI). Media enabled feedback, which contributes to successful online learning.

5.5.5. Development

Course-A

Students were more responsible and independent, there was no mention of facilitator support. They were able to link learning with their profession. They could internalise and personalise their learning experiences. Eight students felt that the course prepared them adequately for their profession, and therefore, contributed to their professional development. However, the shift to remote learning was a major challenge because no one had prepared for it.

> *"…most of the aspects of the course relate to my current practice and this gives me a broader perspective of the profession,"* Student-2.
>
> *"I believe that this course prepares me well for teamwork and presentation skills and soft skills which are essential in the working environment…,"* Student-3.
>
> *"…school links us with internship opportunities,"* Student-8.
>
> *"I have to finish what I have started. However it is not easy, the drastic change from campus learning to online learning was something we were not prepared for and I prefer learning at a library than at home where there are many distractions,"* Student-9.

When asked "which tools or media they suggest their facilitator include" for facilitated students' and facilitators' PEI within the curriculum, nine students in Course-A suggested what they were already using, except one who added a few, and I quote a student;

> *"…OneNote which also have built in collaboration features can be used for interaction, engagement and participation. Virtual whiteboards, like the Microsoft Whiteboard can be very useful for teaching or demonstrating to the students especially calculations and overviews of lecture notes in a similar way to how facilitators would interact with students in a lecture room setting,"* Student-10.

Through group chats and the use of Teams, students were able to participate, engage with content, and interact.

> *"…group-chat on WhatsApp and use Microsoft Teams…,"* Student-4.

The students became more demanding, and working together was an encouragement for them.

Course-B

Students were more responsible and independent, there was no mention of facilitator support. They were able to link learning with their profession. They could personalised their learning experiences. Nine students felt that the course prepared them adequately for their profession, and therefore, contributed to their professional development.

> *"…course prepares me adequately for work, it introduced me to concepts as well as practical application of the concepts,"* Student-4.

> *"…work is relevant to the work done in the work place,"* Student-6.

> *"The WhatsApp group and YouTube Channel that I have subscribed to, make me remain focused…,"* Student-7.

When asked "which tools or media they suggest their facilitator include" for facilitated students' and facilitators' PEI, five students in Course-B suggested what they were already using, except some who added a few, and I quote one student;

> *"I am sure that media platforms allowing more 'live teaching' – example; virtual blackboards, could be employed,"* Student-9.

Students participated in groups, interacted with each other, and engaged any matter of concern.

"…we have to work with partners…is an encouragement …," Student-10.

The students became more demanding, and working together was an encouragement for them.

Summary of development

Table-18 provides the summary of *development* for PEI in Course-A and Course-B instructional design procedure, based on the results from E-moderating and E-learning.

Table-18: Summary of development for two courses

<table>
<tr><th>Course</th><th>Instructional design procedure</th><th>Development</th><th>PEI</th></tr>
<tr><td rowspan="2">Course-A</td><td>E-moderating</td><td><u>Supporting, responding</u>: Demonstrating, live teaching</td><td rowspan="3"><u>Participation</u>: Demonstrating, teaching, activities, current practice, teamwork, collaboration, group, drastic change to online, “suggested OneNote, Virtual Whiteboards, and Microsoft Whiteboard for live teaching”

<u>Engagement</u>: Teaching, demonstrating, current practice, activities, complete, WhatsApp, Teams, drastic change to online, “suggested OneNote, Virtual Whiteboards, and Microsoft Whiteboard for live teaching”

<u>Interaction</u>: Teaching, current practice, teamwork, activities, collaboration, group, chat, WhatsApp, Teams, drastic change to online, “suggested OneNote, Virtual Whiteboards, and Microsoft Whiteboard for live teaching”</td></tr>
<tr><td>Technical support (E-learning)</td><td><u>Providing link outside closed conferences</u>: Aspects…relate to my current practice, broader perspective, profession, prepares me well, teamwork, presentation, skills, essential in the working environment, obligation, complete, studies, equipped, internship, OneNote, collaboration, Virtual whiteboards, Microsoft Whiteboard, group-chat, WhatsApp, Teams, drastic change to online, “suggested OneNote, Virtual Whiteboards, and Microsoft Whiteboard for live teaching”</td></tr>
<tr><td rowspan="2">Course-B</td><td>E-moderating</td><td><u>Supporting, responding</u>: more ‘live teaching’, designed</td></tr>
<tr><td>Technical support (E-learning)</td><td><u>Providing link outside closed conferences</u>: prepares me adequately for work, concepts, practical application, relevant to the work done in the work place,</td><td><u>Participation</u>: Teaching, prepare, work, group, downloading or viewing from YouTube, collaborate, “suggested Virtual Blackboards for live teaching”

<u>Engagement</u>:</td></tr>
</table>

		WhatsApp, group, YouTube, focused, virtual blackboards, partners, encouragement, liaise, "suggested Virtual Blackboards for live teaching"	*Teaching, design, prepare, work, concepts, WhatsApp, YouTube, encouragement, "suggested Virtual Blackboards for live teaching"* <u>Interaction</u>: *Teaching, work, group, WhatsApp, collaborate, "suggested Virtual Blackboards for live teaching"*

There was PEI in *development* for both the courses. About tools or media deployed, the students were actually happy with these technologies except the fact that they needed more of *"live teaching."* In Course-A students suggested technologies like; OneNote, Virtual Whiteboards, and Microsoft Whiteboards. In Course-B they suggested; Virtual Blackboards.

There was no much involvement of facilitators in *development*. The students in Course-A were aware of the challenges that were associated with the *"drastic change"* to online learning and it was something the students were not prepared for.

5.6. Document analysis

The aim for document analysis was to supplement interviews' and questionnaires' data. The researcher leaned on Voce's (2005) statement that documents, records, archives and artefacts provide a rich source of information, and that organisations have some kind of a trail of papers where some information can be mined as part of fieldwork, and he therefore included document analysis to collect some secondary data for the study.

5.6.1. Facilitators' perceptions on online learning instructional design facilitating PEI for two online courses

Course-A

The course included the following aspects that the researcher noted due to their importance regarding the purpose of the study:

- **Outcomes**

"This course aims to encourage students to acquire knowledge, develop skills and competencies, and to develop positive attitudes towards Technology, and towards the technological changing world."

- **Experience**

  "Students were expected to: Develop a variety of technological skills such as the ability to work with tools or equipment, and communicate information in a number of ways."

- **Content, assignments and coursework**

  The content was divided into six modules, *"MODULE 1…MODULE 6."*

  "Assignments will NOT be accepted more than 3 days after the due date…except illness or urgent private affairs…Final mark for the course is made up of coursework and examination results graded with rubrics."

Learning outcomes or objectives were stated and defined. For examples, this course was designed to equip students with technology skills. Students were expected to demonstrate certain abilities while learning. Facilitator had allocated time, and there were resources stipulated or given. The content of the course was divided into modules. Assignments and coursework were graded according to rubrics. Conditions for submissions were defined, including late submissions, and issues involving illness or urgent private affairs.

Course-B

The course included the following aspects that the researcher noted due to their importance regarding the purpose of the study:

- **Objectives**

  "The course…focuses on the…advocacy and examines a number of skills required to advance the implementation…at school level."

- **Experience**

  "Students were expected to: Challenge current educational practices and assumptions thereof regarding support for learners with barriers to learning."

- **Content, assignments and coursework**

  "The content was divided into two parts, "PART A and PART B."

"Assignments or tasks must be submitted on the due date, at the specific time stipulated after the session, and grading rubrics will be implemented. Late assignments will be accepted within a grace period of three days and will only be assigned a maximum of 50%. Thereafter, no assignment will be accepted: in which case the mark awarded will be 0% FOR NON-PERFORMANCE. Should there be unforeseen circumstances such as illness, then a valid medical certificate will be required or certified proof if there are urgent private affairs."

The researcher noted a few aspects from Course-B. Learning outcomes or objectives were stated and defined. For examples, this course was designed to enable students to critically consider theory, policy, and practice regarding learning support for education. Lectures were allocated time, and there were resources stipulated or given. The content of the course was divided into parts. Assignments and tasks were graded according to rubrics. Conditions for submissions were defined, including late submissions, and issues involving illness or urgent private affairs.

In summary, facilitators' perceptions on online learning instructional design facilitating PEI for the two online courses point to the importance of careful consideration of learning outcomes (objectives), students' experience (prior knowledge), content, assignments, and coursework.

5.7. How online learning instructional design of the two online courses facilitates students' and facilitators' PEI (document analysis)

The researcher, in this section, discusses how online learning instructional design of the two online courses facilitates students' and facilitators' PEI. However, only the documents were considered at this stage.

5.7.1. Access and motivation

Course-A

Course-A provides students with the course learning outcomes, because of this, students get motivated, and be able to do their work online.

"Outcomes of the course…"

"This course aims to encourage students to acquire knowledge…work with online tools…"

The outcomes encouraged students, because students knew what to expect or what is expected of them. Online tools also helped the students to access materials. Students engaged with the outcome and online tools, and participated in online learning. Interaction noted was student-to-material.

Course-B

Objectives for students to go by were set. They encouraged students to focus. There was no mention of students accessing the system or material online.

"Objectives of the course will enable students to…"

The students engaged with objectives to understand what is expected of them. They participated by reading and doing what was needed. Interaction noted was student-to-material interaction.

Summary of access and motivation

Table-19 provides the summary of *access and motivation* for PEI in Course-A and Course-B instructional design procedure, based on the results from E-moderating and E-learning.

Table-19: Course-A and Course-B access and motivation

Course	Instructional design procedure	Access and motivation	PEI
Course-A	E-moderating	Welcoming and encouraging: *Outcomes, encourage*	Participation: *Work* Engagement: *Outcomes, encourage, work, tools* Interaction: *Tools, work*
	Technical support (E-learning)	Setting up system and accessing: *Work, online tools*	
Course-B	E-moderating	Welcoming and encouraging: *Objectives*	Participation: *Course material* Engagement: *Objectives, course material* Interaction: *Course material*
	Technical support (E-learning)	Setting up system and accessing: *Course material*	

There was PEI in *access and motivation* for both the courses. The difference was, in E-learning there was no mention of students accessing the system or online material for Course-B.

However students would still be able to engage with the objectives set and participate in learning. The interaction identified was in the form student-to-material.

Documents provided no information for *information exchange, online socialisation, knowledge construction, and development* of instructional design procedures, except that the two courses were conducted online, and that for some assignments, students were expected to work in groups. For example one assignment had the following information: *"…using these macro-perspectives, explain* ***as a team*** *how…,"* Course-B. This shows how important collaboration was taken for facilitated PEI.

5.8. Data triangulation

This research used individual facilitators' interviews, students' questionnaires, and document analysis for collecting data. As a result, it was necessary to triangulate evidence (results) from the three methods to reach the findings and confirm if PEI was evident in both the courses. The following tables (table-20 and table-21) are showing how the results were triangulated, for both courses, following the strategy shown in figure-5 (chapter 3 page-26).

Table-20: Course-A triangulated results

Access and motivation	Online socialisation	Information exchange	Knowledge construction	Development
Participation: *Work, write, submitting* Engagement: *Outcomes, work, outlines, marking rubrics, prior knowledge, Teams, write, submitting, computers, access, cameras, recorders, encourage, tools* Interaction: *Work, Teams, computers,*	Participation: *Work, send, collaboration, groups, study, partners, activities, post, not getting data* Engagement: *Work, outcomes, Emails, WhatsApp, Sakai, Study, activities, post, not getting data* Interaction: *Work, communicate, send, Emails, WhatsApp, Sakai, collaboration,*	Participation: *Discussions, work, comments, group* Engagement: *Outcomes, Sakai, Emails, WhatsApp, work, uploading, videos, slides, Simulations, display, outline, rubrics, resources, encourage, E-libraries, website, announcements, Teams, textbooks* Interaction:	Participation: *Lessons, work, reflect, corrections, collaboration, feedback, comment, lectures, sessions, discussions, submit, groups, assessments, absence of technology or its skills, lack of confidence, dominance by others, intimidated by receiving feedback in a crowd learner isolation*	Participation: *Discussions, demonstrating, teaching, activities, current practice, teamwork, collaboration, group, drastic change to online, "suggested OneNote, Virtual Whiteboards, and Microsoft Whiteboard for live teaching"* Engagement: *WhatsApp, teaching,*

access, rubrics, tools	*groups, study, WhatsApp, partners, activities, not getting data*	*Sakai, Emails, WhatsApp, discussions, work, rubrics, resources, E-libraries, website, announcements, comments, Teams, textbooks, chat, group, meetings*	Engagement: *Explain, clarify, check, access, lessons, work, outcomes, questions, reflect, corrections, feedback, Email, Sakai, Teams, lectures, sessions, rubric, submit, answer, assessments, learner isolation* Interaction: *Communicate, access, lessons, work, feedback, questions, collaboration, reflect, Email, Sakai, Teams, lectures, sessions, marks, rubric, discussions, groups, answer, assessments, absence of technology or its skills, lack of confidence, dominance by others, intimidated by receiving feedback in a crowd, learner isolation*	*demonstrating, current practice, activities, complete, Teams, drastic change to online, "suggested OneNote, Virtual Whiteboards, and Microsoft Whiteboard for live teaching"* Interaction: *WhatsApp, discussions, teaching, current practice, teamwork, activities, collaboration, group, chat, Teams, drastic change to online, "suggested OneNote, Virtual Whiteboards, and Microsoft Whiteboard for live teaching"*

Internet access or "*data"* acquisition for learning made some students to be excluded in learning process. Data acquisition and learner isolation were linked to inequalities that are associated with students' socioeconomic backgrounds and challenges that led to unequal access to learning experiences. Learner isolation was a result of absence of technology of its skills, lack of confidence, and dominance by others. Course-A was structured following a specific learning pathway towards achieving learning outcomes or objectives. However more of *"live teaching"* was needed for this course. The students were aware of the challenges that were

associated with the *"drastic change"* to online learning and it was something everyone did not prepare for.

Table-21: Course-B triangulated results

Access and motivation	Online socialisation	Information exchange	Knowledge construction	Development
Participation: *Learning, downloading or viewing YouTube videos, course material* Engagement: *Learning, objectives, Sakai, internet, prior knowledge, resources, YouTube videos, course material* Interaction: *Sakai, learning, internet, resources, course material*	Participation: *Collaborate, groups, help, group, assignment, send, not getting internet access or data* Engagement: *WhatsApp, Teams, Sakai, encourage, assignment, Emails, not getting internet access or data* Interaction: *Collaborate, help, groups, WhatsApp, Teams, Sakai, assignment, send, messages, Emails, not getting internet access or data*	Participation: *Lessons, post, meetings, sessions, collaboration,, discussions, activities (presentation), lecture, explain, groups* Engagement: *Lessons, post, sessions, Emails, WhatsApp, Teams, Sakai, activities, objectives, lecture, information, internet, slides, WhatsApp, platforms* Interaction: *Lessons, meetings, sessions, collaboration, Emails, WhatsApp, Teams, Sakai, discussions, activities, lecture, internet, slides, telephone calls, communicate, meetings, platforms, groups*	Participation: *Collaborate, reflection, improvements, feedback, sessions, conference, activities, group, big class size, absence of technology or its skills, lack of confidence (shyness), dominance by others, learner isolation* Engagement: *Question and answer, suggestions, monitor, inquiries, improvements, feedback, reflection, sessions, questions, activities, recordings, WhatsApp, constructive criticism, ask, questions, Email, Sakai, learner isolation* Interaction: *Question and answer, feedback, inquiries, collaborate, reflection, sessions, conference, calls, communicate, activities, marks, group, WhatsApp, ask, Email, Sakai,*	Participation: *Accommodate everyone, teaching, prepare, work, group, downloading or viewing from YouTube, collaborate, "suggested Virtual Blackboards for live teaching"* Engagement: *WhatsApp, teaching, design, prepare, work, concepts, YouTube, encouragement, "suggested Virtual Blackboards for live teaching"* Interaction: *WhatsApp, accommodate everyone, teaching, work, group, blackboards, collaborate, "suggested Virtual Blackboards for live teaching"*

			big class size, absence of technology or its skills, lack of confidence (shyness), dominance by others, learner isolation	

Internet access or "*data"* acquisition for learning, made some students to be excluded in learning process. Data acquisition was one of inequalities that were associated with students' socioeconomic backgrounds and challenges that led to unequal access to learning experiences. Big class size was found as a hindrance to effective interaction and participation, and it led to learner isolation. Issues for isolation were; dominance by others, technology, and lack of confidence or shyness. Course-B needed more of *"live teaching."*

5.9. Conclusion

Based on the results, there was a common design for both the courses, and what was done by facilitators and their students was almost the same, regarding PEI which was evident in both designs. Students were helped to realise that they had a base of people to communicate with and be supported by, as they engaged in learning process. PEI was facilitated through collaboration that was promoted by the facilitators with media or online tools.

As learning progressed, students became independent, confident, and were passionate about working online. Their understanding improved for both the courses; they made course-related discussions (conferencing), and applied critical thinking to subject matters. There was productive collaboration that took place. The facilitators facilitated the process and guided the students' learning progress, gave feedback, and encouraged reflections. Feedback and reflection were important aspects in instructional design of both the course and for this study, they housed all the three elements (PEI). As students' learning improved, facilitators' involvement became low. For example, students became independent and could link learning with their profession. Online learning instructional design had impact on students' and facilitators' PEI. As a result it is important to acknowledge students' and facilitators' PEI in online teaching and learning.

Chapter Six
Discussion of Findings

6.1. Introduction

This study sought to investigate how online learning instructional design of two online courses offered in a South African university facilitates students' and facilitators' PEI. This chapter discusses the findings of the study.

6.2. Main findings

This section presents discussions of findings on instructional design of Course-A and Course-B after making students' and facilitators' PEI more evident. The investigative tool developed for this study informed the interpretation of these discussions.

6.2.1. Course-A main findings

This subsection presents discussions on instructional design of Course-A. Table-22 presents summary of the findings used to discuss the findings.

Table-22: Course-A summary of findings

Instructional design procedures	Instructional design facilitating students' and facilitators' PEI	Key
Access and motivation	Welcoming and encouraging, setting up system and accessing	PE, PI
Online socialisation	Familiarising and providing bridges between cultural, social and learning environments, sending and receiving messages	PE, PI, NI
Information exchange	Tutoring and supporting use of learning materials, searching, personalising software	PE, PI
Knowledge construction	Facilitating process, conferencing	PE, PI, NI
Development	Supporting, responding, providing link outside closed conferences	PE, PI, NI

Key to read 'Course-A summary of findings table':
***PE**: PEI evident, **NP**: No PEI, **PI**: Instructional design's positive influence on PEI, **NI**: Instructional design's negative influence on PEI*

Having technology background in the first phase made access to the course easy and that motivated the students *(PI)*. In addition, students were provided with the course's learning outcomes from the onset and because of that, students became motivated and were able to do extra work online as they knew what is expected of them. Learning outcomes are important in

instructional design, in accordance with goal setting theory, students motivate themselves if they are provided goals for the future (Loke & Lathams, 1990) and this is an attribute that determines their success in online learning.

Various online platforms enabled student-student and student-facilitator communication *(PE)*. Also promoted collaboration as they worked in groups *(PI)*. Fisher & Baird (2005; p.96) attested that "…working in groups or collaboration forms social bonds, and as they deepen, motivate students within the group through participation to the collective knowledge of the group." Thus, students in this course could express their feelings towards their course and could send messages and course materials through Sakai, Emails, WhatsApp, and Teams. However, some students struggled with issues external to the course such as data acquisition, and this created negative influence on PEI as students could not socialise adequately online.

Students strived to reach learning outcomes. They did simulations, uploaded slides and recorded videos through Sakai, Emails, and WhatsApp, and they also did their activities using online tools *(PI)*. They personalised their learning by making discussions, and group-chats. Discussions were mostly done on WhatsApp. Social media such as WhatsApp presents an environment that encourages critical thinking and collaboration for course work that is supplemented with outside materials and knowledge developed by a peer group (Mazman & Usluel, 2010). Engagement with social media makes students develop connections with peers, establish a virtual community of learners and eventually increases their overall learning performance (Fewkes & McCabe, 2012).

Students' level of understanding increased, they posed questions, created meaningful conversations and discussions, their collaboration was productive, and they did work more effectively *(PI)*. They became more responsible and independent, there was little facilitator involvement (for example in discussions). Too much facilitator involvement, such as in discussion forums, decreases students' participation from fear of making mistakes (Dennen *et al*., 2007).

Some students experienced the feeling of isolation, and this linked to socioeconomic challenges *(NI)*. The issues of isolated learners were a result of technology, lack of confidence, and dominance by others. These created negative influence on PEI because students could not construct knowledge without associating with others, or taking part in course activities.

Students were guided, given feedback within reasonable time, and did reflections which added value in facilitating PEI. Gikandi, Morrow, & Davis (2011) found feedback and reflection as

excellent ways to encourage quality participation and interaction that facilitate the sharing of knowledge and create a community of inquiry. Feedback creates connection between students and facilitator by affirming how students are performing well and detailing ways to improve (Muirhead, 2004). Kalman & Rafaeli (2005) said that, online learning students experience frustration when they do not receive feedback for their work and within a reasonable time period. As a result, there is little doubt that late responses also have a negative effect on the vitality of students' activities involving collaboration and discussion. Students' participation rate drops due to such delays (Dringus & Ellis, 2010).

Students received feedback in the form of written comments, marks, and graded rubrics *(PE)*. However, some students felt that it was intimidating to receive feedback in large groups, and this affected their PEI and lowered their confidence *(NI)*. Shift to remote learning was also a major challenge because no one had prepared for it. There was inadequate live teaching or sessions in the course for facilitating students' and facilitator's PIE and better learning process.

6.2.2. Course-B main findings

This subsection presents discussions on instructional design of Course-B. Table-23 presents summary of the findings used to discuss the findings.

Table-23: Course-B summary of findings

Instructional design procedures	Instructional design facilitating students' and facilitators' PEI	Key
Access and motivation	Welcoming and encouraging, setting up system and accessing	PE, PI
Online socialisation	Familiarising and providing bridges between cultural, social and learning environments, sending and receiving messages	PE, PI, NI
Information exchange	Tutoring and supporting use of learning materials, searching, personalising software	PE, PI
Knowledge construction	Facilitating process, conferencing	PE, PI, NI
Development	Supporting, responding, providing link outside closed conferences	PE, PI, NI

Key to read 'Course-B summary of findings table':

***PE**: PEI evident, **NP**: No PEI, **PI**: Instructional design's positive influence on PEI, **NI**: Instructional design's negative influence on PEI*

Having prior knowledge made students to realise their potentials and increased understanding, it was enough motivation that they could make it *(PI)*. Schraw, Flowerday, & Lehman (2001) show that moderate prior knowledge increases interest and learning. Additionally, some studies

indicate that prior knowledge increases engagement and understanding (Alexander & Jetton, 1996).

Objectives for students, to go by, were set. Students knew what to expect or what is expected of them. This encouraged students to focus in their studies, and thus improved PEI *(PI)*. Objectives or outcomes linked positively to PEI. PEI are features enabling critical thinking and they are responsible for students' better or worse grades (Carini, Kuh, & Klein, 2006). Balaji & Chakrabarti (2010) found that setting clear expectations encourage students to complete activities, especially those informed by collaboration and discussion.

Students accessed the system whereby they collaborated and networked with each other *(PE)*. They built learning communities via WhatsApp, Teams, and Sakai. This helped them to realise they were in the same situation together *(PI)*. They sent and received messages. Some shared their feelings. Some struggled with internet access or data acquisition (issues external to the course). Inability to acquire data made some students be excluded in learning process, and got unequal access to learning experience. This affected their PEI, as they could not socialise online without data. Familiarisation was created through collaboration.

Students attended lessons and did activities, sharing information was through Sakai, Emails, WhatsApp, and Teams *(PE)*. They became articulate as the presentations, summaries, and assignments were done well *(PI)*. They also became independent, confident, and were passionate about working online. They did a lot of work online including having discussions for sharing knowledge. Discussions (in forums or using any other tool) is among the technology based techniques through which the transfer of knowledge is facilitated by interacting with peers or knowledgeable others (Valiathan, 2002). Kanuka (2005) maintains that discussions facilitate students' participation and critical thinking.

Students had question and answer sessions. They could apply critical thinking to subject matters by making inquiries, suggestions, and providing constructive criticisms *(PI)*. There was highly productive collaboration developed, and sharing of ideas amongst the students. Students were guided, given feedback within reasonable time, and did reflections, which facilitated PEI. Reflection and feedback provide meaningful learning and the value of students sharing ideas (Martin & Ertzberger, 2016). Students received verbal and written feedback, through Sakai, WhatsApp, group conference calls, Email, and on assignments that had comments or graded rubrics *(PE)*. However, the big number of students in the course, influenced students'

frustration, and inadequate PEI *(NI)*. Students in large size classes and courses are less willing to interact (Iaria & Hubball, 2008).

Some students experienced the feeling of isolation *(NI)*. Isolated learners could not respond to anything, and it was hard to identify them until their participation was closely monitored. Often times they were left behind if they could not cope. Because individuals with problems could not be reached in time, large classes affect PEI. This makes it evident that not only socioeconomic challenges cause learner isolation, also class or course conditions do. Other issues for isolation were; dominance over others, technology, and lack of confidence or shyness.

Students became more responsible and independent, and there was minimum facilitator involvement *(PI)*. Students were able to link learning with their profession. They could personalise their learning experiences. However, there was inadequate live teaching or sessions from the course for facilitating students' and facilitator's PIE and improving learning process.

6.2.3. Conclusion

The findings elaborate on how online learning instructional design facilitates students' and facilitators' PEI for two online courses. They also suggests that both courses were designed the same. This confirms the view of Lowenstein (2009) that courses serving together for the same purpose (education requirement or qualification) make a curriculum of a division (department). This study shows that instructional design is a collective activity in a division and this helps in ensuring students in a discipline have the same learning experience.

6.3. Combined summary of findings

This section presents how online learning instructional design facilitating students' and facilitators' PEI minimises student failure and dropouts in online learning. Curriculum is made up of multiple courses in a division, therefore it is necessary to provide combined summary of the two courses as discussion in table-24 below.

Table-24: Combined summary of findings

Instructional design procedures	**Facilitating students' and facilitators' PEI** *(reach outcomes or successful learning)*	**Not facilitating PEI** *(student failure or dropout)*
Access and motivation *(E-moderating and E-learning)* *Welcoming and encouraging, setting up system and accessing*	Student show ability to use online tools and demonstrate eagerness to put necessary time and effort. Facilitators welcome students and offer them support for encouragement.	Lack of necessary prior knowledge and materials, unspecified or unclear objectives (outcomes).
Online socialisation *(E-moderating and E-learning)* *Familiarising and providing bridges between cultural, social and learning environments, sending and receiving messages*	Students form groups and work together on collaborative tasks. They express their behaviours, needs, fears, and feelings. They send and receive messages from each other. Facilitators make introductions for familiarisation in online environment.	Inequalities associated with students' socioeconomic backgrounds and challenges, for example unable to acquire "*data*."
Information exchange *(E-moderating and E-learning)* *Tutoring and supporting use of learning materials, searching, personalising software*	The students do activities, appreciate the wide range of information available on internet, and become independent, confidence, and more passionate about working online. They share knowledge and material. Facilitators facilitate, organise activities, assign roles and responsibilities, support use of learning materials, encourage discussions, and summarises outcomes for students.	Lack of confidence or motivation.
Knowledge construction *(E-moderating and E-learning)* *Facilitating process, conferencing*	Students' understanding improve; they make course-related discussions (conferencing), apply critical thinking to subject matters, and make productive collaboration. Facilitators facilitate the process and guide the students' learning progress, ask questions, give feedback, and encourage reflections.	Learner isolation, big class size, absence of technology or its skills (inequalities associated with socioeconomic background and challenges), lack of confidence, dominance by others, intimidation by receiving feedback in a crowd, late or no feedback, no reflection, no collaboration, and no discussion.
Development *(E-moderating and E-learning)*	Students become more responsible of their own learning through technology-aided	Facilitators' maximum involvement (for example

Supporting, responding, providing link outside closed conferences	medium, and need little support from the facilitator. They become more demanding, they link learning with their profession, and they may have more recommendations.	in discussions). Inadequate live teaching.

6.4. Chapter conclusion

The online learning instructional design of Course-A and Course-B maximised students' and facilitators' PEI through online activities, enabled communication that stimulated perspectives, and increased chances for collaboration, discussion, feedback, and reflection. It is evident from the study that the relationship between the instructional design procedures confirms the importance of PEI for successful online learning.

Chapter Seven
Conclusion and Recommendation

7.1. Introduction

This chapter discusses limitation, recommendation, and conclusion. To accomplish the research task, the literature that had a direct bearing on the purpose of the study was reviewed. The purpose of the study was to investigate how online learning instructional design of two online courses offered in a South African university facilitates students' and facilitators' PEI, and find answers to the guiding research questions as:

Main research question

- *How online learning instructional design does facilitates students' and facilitators' PEI in two online courses?*

Instructional design's positive influence on PEI

Having technology background (prior knowledge) made access to the courses easy, that motivated the students and increased their PEI. Learning outcomes or objectives from the onset also motivated the students as they knew what to expect or what is expected of them, and thus facilitating PEI.

Various platforms enabled student-student, student-facilitator, and student-material interaction. They also promoted collaboration and discussion that formed social bonds which motivated students within the groups through PEI to the collective knowledge of the groups or learning communities. Feedback, within reasonable time, and reflections improved the sharing of knowledge, thus facilitating students' and facilitators' PEI. Minimum facilitators' involvement, such as in discussion forums, reduces fear from making no mistakes, and thus facilitating PEI.

Instructional design's negative influence on PEI

Some students struggled with issues external to the courses such as data acquisition, and this impacted negatively on PEI as students could not socialise adequately online.

Receiving feedback in large groups was intimidating for some students, this lowered their confidence and affected PEI. Therefore, hindering with students' knowledge development. Inadequate live teaching or sessions affected facilitated PIE and better learning process.

Learner isolation that impacted negatively on students' and facilitators' PEI. Students could not construct knowledge without associating with knowledgeable others, or taking part in course activities.

In a nutshell, support was through collaboration, discussion, feedback, and reflection that were implemented during the instructional design of the two online courses on study. Necessary students' prior knowledge (like technology background), materials, stated or clarified outcomes, and minimum facilitators' involvement existing, also facilitated students' and facilitators' PEI.

Sub-questions

1. *What are the perceptions of the facilitators on online learning instructional design facilitating PEI for two online courses?*

Online learning instructional design should enable students' collaboration to the collective knowledge of the groups formed, and towards reaching learning outcomes or objectives.

2. *What are the students' responses to online learning instructional design in terms of facilitating PEI for two online courses?*

Students were able to construct knowledge with peer support using tools (materials) provided or suggested. They shared knowledge and resources. They built learning communities for communication and collaboration, and they also completed activities.

7.2. Limitation

The study was limited to two online courses within the curriculum of a specific department, two facilitators for interviews and document reviews, and twenty randomly selected students (total) from the two courses to answer the questionnaire. Online learning was seen as rooted in the views of social constructivism. Therefore, online learning instructional design for this study followed similar views which might not be the case with other designs regarding students' and facilitators' PEI. Moreover, there are a number of aspects that have to be considered before any course's instruction is designed, including policies, that were not covered in this study but that could be included for further research.

7.3. Recommendation

Since the study was focusing on how online learning instructional design facilitates students' and facilitators' PEI, it could also be important to observe the causes of successful online learning instructional design or factors that influence it (including policies). Students-participants in this study recommended online learning to be more of live (virtual) sessions than "post and retrieval". If, more times, there could be synchronous lessons, learning would be enjoyable and therefore better. This type of interaction makes lessons more interesting and ignites students' eagerness to learn.

There should only be enough number of students enrolled in online courses, the ratio of which the facilitators could handle effectively, and university should find ways or measures to close the gap between students with technological footing and those without. More importantly, for improved instructional practices, it is essential for facilitators to always redesign their online courses or instruction if, by any chance, the students report their learning process as limited somehow to fill that gap.

7.4. Conclusion

The study was qualitative, and used a number of research instruments. Students' and facilitators' PEI as a result of instructional design for the two online courses, redirected learning to social activity of knowledge construction. On this basis, learning communities, collaboration and discussion played a pivotal role in facilitating students' and facilitators' PEI. This supports the view that learning is more than the assimilation of new knowledge by students, it is the process by which students are integrated into a knowledge community (Vygotksy, 1978).

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Appendices

- **Appendix-1: Facilitators' interview**

Interview introduction: Good morning (afternoon/evening)! Thank you for agreeing to meet with me and share your views. As you may know, the purpose of this interview is to help us to investigate how online learning instructional design of two online courses offered in a South African university facilitates students' and facilitators' PEI. Before we begin, let me review some important considerations. I am recording this interview but will keep all responses confidential. The transcript will be handed to you for data validity assurance. I am just as interested in both negative and positive comments and often the more challenging and in depth comments are the most helpful.

1. Tell me about yourself and your experience as an instructor.
   Pose question: How long have you taught online courses and were these courses (some of them) outcomes based?
   Pose question: Do you believe learners often reach the set outcome? Why/Why not?
2. Are you happy with the learning environment your course is built in to? Please explain.
3. What are your definitions of participation, engagement, and interaction in an online course?
4. Using your definitions, do you feel like learners are participating, engaged, and interacting in this course? Why/Why not?
   Pose question: Do you feel like this class is particularly different than any other class that you have previously taught? Please explain.
5. What kind of assignments/activities do you feel are most engaging, the ones that call for learners' participation, also those that causes the interaction in an online course?
   Pose question: Can you describe an assignment that you particularly enjoyed and felt really motivated learners to learn more about a topic?
6. To what level (minimum/maximum) do you participate in learners online activities (e.g. discussions in the forum)? Why?
7. Do you often interact with your learners online? How?
   Pose question: Do you consider feedback as type of interaction? How long should it take to be received?
   Pose question: Is it necessary for learners to reflect on their work, and review each other's work? Please explain.
8. Have you ever experienced the problem of learner isolation in any of online courses that you taught? If yes, how did you solve it?
9. Do you have any other information that you would like to share regarding your experiences as an online instructor?

The interview questions (with modifications to suit the purpose of my study) by Humber (2018 page 141) from her dissertation: Humber, J. F. (2018). *Student engagement in online courses: a grounded theory case study.* Alabama: Tuscaloosa.

Thank you very much for participating

- **Appendix-2: Students' questionnaire**

Please answer all the questions on the spaces provided for each question and return the questionnaire to the researcher.

Age

[ ] years old.

Understanding the instruction

1. What expertise/knowledge was required for you to be admitted into the qualification you are pursuing?

_____

_____

2. According to you, are the intended learning outcomes stated and clearly defined for this online course? Why?

_____

_____

3. Do the activities give you opportunity to reflect on your work?

_____

_____

4. Do you think the course materials or resources provided for this course stimulate your learning? Yes/No. Motivate your answer.

_____

_____

5. Do you feel this course prepares you adequately for your work/profession and contributes to your professional development? Please elaborate.

_____

_____

6. During the learning process there are cases at times where a student may feel isolated, or others dominating, for example, in a discussion or group work. Have you experienced any? If so, please mention what could have been the cause.

_____

_____

Participation, interaction and engagement

7. What types of activities best motivate and encourage you to learn in this course?

_____

_____

8. Does the facilitator advice you to build learning communities? If yes, how helpful are they? If not, how do you manage learning without peer support?

_____

_____

9. How do you receive feedback (from facilitator to student, and student to student), and does it contribute to your learning?

_____

_____

10. Using what tools/media, in this course, do you:

1. Engage in your learning _____
2. Participate with others in your learning _____
3. Interact with:
    - The facilitator _____
    - Each other_____
    - Material_____

11. Do you have problems using these tools/media (mentioned in the previous question)? If yes, please explain.

_____

_____

12. When encountering problems using technologies in the course, do you receive assistance, in a timely manner, and by whom (e.g. support service, colleagues, facilitator etc.)?

_____

_____

13. Do you have any suggestions on what tools the facilitator can include for the online students' improved:

1. Interaction, (if YES)_____
2. Participation, (if YES) _____
3. Engagement? (if YES) _____

14. Mention what makes you remain studying or makes you stay focused in this course.

_____

_____

Thank you for your participation!!!

- **Appendix-3: Facilitator-1 transcript**

1. Tell me about yourself and your experience as an instructor/facilitator.
I have much experience as an instructor, judging by the 7 years that I have teaching.
Pose question: How long have you taught online courses and were these courses (some of them) outcomes based?
My courses are outcomes based.
Pose question: Do you believe learners often reach the set outcomes? Why/Why not?
In that little time I realized how online platform such as e-learning assists both myself and students. This (e-learning) assists students to reach set outcomes (I would say), as students are able to do extra work online for better understanding.
2. Are you happy with the learning environment your course is built in to? Please explain.
Yes, I can upload my slides, recorded videos and even communicate with students.
3. What are your definitions of participation, engagement, and interaction in an online course?
This for me would be students working effectively and productively in striving to reach the outcome and working in association with each other.
4. Using your definition(s), do you feel like learners are participating, engaged, and interacting in this course? Why/Why not?
To some extent yes, because they can access content easily, and they understand the lessons based on their activities also they communicate within themselves.
Pose question: Do you feel like this class is particularly different than any other class that you have previously taught? Please explain.
I don't feel it's the same, the level of understanding is better as I've learned to explain some of the concepts better.
5. What kind of assignments/activities do you feel are most engaging, the ones that call for learners' participation, also those that causes the interaction in an online course?
Simulations.
Pose question: Can you describe an assignment that you particularly enjoyed and felt really motivated learners to learn more about a topic?
Where students have to give a step by step explanations about a certain principle or mimic a practice to solve a scenario.
6. To what level (minimum/maximum) do you participate in learners online activities (e.g. discussions in the forum)? Why?
I'd say less, because some of the discussions we do them via whatsApp.
7. Do you often interact with your learners online? How?
Yes, by posting stuff/lessons. Then they'd pose questions to me, anywhere, for example; Sakai, emails, whatsApp.
Pose question: Do you consider feedback as type of interaction? How long should it take to be received?
Feedback can be interaction, because I'd explain to students where they went wrong and they'd be asking questions to clarify misconceptions. Am not sure about the time frame, but as soon as you're done marking.
Pose question: Is it necessary for learners to reflect on their work, and review each other's work? Please explain.
It's important for students to review their work, that gives them a better understanding of the concepts.
8. Have you ever experienced the problem of learner isolation in any of online courses that you taught? If yes, how did you solve it?
Yes, some of the students struggle with data. I didn't really solve it, the school provides data/wifi.
9. Do you have any other information that you would like to share regarding your experiences as an online instructor?
Not really, I've shared all my little experiences. Unless if there are more questions.

- **Appendix-4: Facilitator-2 transcript**

1. Tell me about yourself and your experience as an instructor/facilitator.

I taught and still teach undergraduate and postgraduate levels. I have been teaching in this institution probably more than 6 years now.

Pose question: How long have you taught online courses and were these courses (some of them) outcomes based?

Courses are not necessarily outcomes based, I would rather say I set objectives for my students.

Pose question: Do you believe learners often reach the set outcomes? Why/Why not?

If students do assignments well, then I believe they would have reached the objectives.

2. Are you happy with the learning environment your course is built in to? Please explain.

I believe in inclusion in education. Inclusion is a very big part of how I understand teaching. What is important for me is that the environment must be inclusive. It must include everybody and as we know that online learning and Sakai methods and so forth not everybody can access them, even though it is said they don't use much data. People are struggling with very basic issues including internet access. If you will have those kinds of online learning environments which will not include some students and then at the same time you have some students who have had access to technology and these kinds of environments since private schools or before that, and also in their homes, these students are embarked to do well while others are seriously disadvantaged because of not having opportunity to engage with these technological tools, and now they have these environments. I am not happy with what we have as learning environment because we haven't made enough effort to equalise that gap between students who have had and still have access to technological tools and online resources, and those who don't. This exacerbates the inequality among students and it shouldn't be so.

3. What are your definitions of participation, engagement, and interaction in an online course?

With me, while teaching my course I like students to collaborate a lot and to network with each other, so that they can share skills and resources.

4. Using your definition(s), do you feel like learners are participating, engaged, and interacting in this course? Why/Why not?

In my class, I often tell my students that they are a team and they all do the same things, so they might as well collaborate and learn from one another. That kind of experience helps them when learning important skills like pure learning and gravel of teaching. We also have students teachers who are very experienced and inexperienced students teachers in the same class, so experienced students will share a lot and also learn from inexperienced students. But these kind of experience doesn't usually happened. For me this is very disappointing.

Pose question: Do you feel like this class is particularly different than any other class that you have previously taught? Please explain.

The classes have gone bigger, university is accepting more and more postgraduates. Because of the bigger number the interactions are not so effective.

5. What kind of assignments/activities do you feel are most engaging, the ones that call for learners' participation, also those that causes the interaction in an online course?

Presentations, and making summaries to boost confidence.

Pose question: Can you describe an assignment that you particularly enjoyed and felt really motivated learners to learn more about a topic?

Students present readings to each other and then discuss. Team members collaborate with each other and discuss how they want to present to the whole class. After presentation there will be question and answer, comments and inputs.

6. To what level (minimum/maximum) do you participate in learners online activities (e.g, discussions in the forum)? Why?

Minimum. Some students might not have internet access. I always try to accommodate everyone by creating some other kinds of platforms like WhatsApp, where students can pose questions and when the internet is cheaper and I respond. Everybody participates. These is what I always try rather than actual teaching online. I also like having groups so that students have some kind of discussions.

7. Do you often interact with your learners online? How?

Yes, by posting lessons/activities. Then they'd pose questions to me, anywhere, for example, Sakai, emails, WhatsApp, or teams.

Pose question: Do you consider feedback as type of interaction? How long should it take to be received?

Feedback is a very important aspect of interaction especially at postgraduate level, because it helps students to monitor their own progress and make improvements where needed. It gives them idea of what actually is wanted of them. Feedback must be given when the work is complete.

Pose question: Is it necessary for learners to reflect on their work, and review each other's work? Please explain.

It is necessary, for improvement and way forward. For example, if honours students want to join masters they can easily be able to see through the work done.

8. Have you ever experienced the problem of learner isolation in any of online courses that you taught? If yes, how did you solve it?

Yes, when a learner feels isolated they don't respond. You become not aware until you closely monitor their participation, they simply don't respond regardless of your trying or efforts. This is a very difficult situation because I think it is up to the student to contact us if they start feeling somewhat of the teaching and learning. There are also uncertainties on us towards students, you may think you are right while you are wrong about that particular student, and remember the classes have gone bigger. At times it is up to individuals to sort themselves or they become left behind, and I don't like that ideology of some students being left behind but little can be done.

9. Do you have any other information that you would like to share regarding your experiences as an online instructor?

For online learning on emergency it's a different situation because not all aspects on learning and teaching online are considered, so I will not talk about it. But with online learning I can only say that we should bridge the gap between the students with technological footing and those without.

- **Appendix-5: Sample documents**

Sample course outlines' raw data	
Course-A (course outline)	**Course-B (course outline)**
Course information and structure: "…This online course seeks to encourage students to acquire knowledge, develop skills and competencies …" *Set outcomes/objectives*: "Build a framework of knowledge based on reading, observation, experience and reflection…" *Resources*: "Clarke, J.H. and Biddle, A.W. 1993. *Teaching Critical Thinking: Reports from Across the Curriculum.* New Jersey: Prentice hall, Inc…"	*Course information and structure*: "…The course also focuses on the research, advocacy and examines a number of skills required …, the Course is divided up into two parts…" *Set outcomes*: "critically consider educational research, theory, policy, and practice…, reflect upon the process of dynamic assessment in providing pedagogical opportunities for learner access and participation." *Resources*: "Hart, S. Dixon, A. Drummond, MJ. MacIntyre, D. (2004) *Learning without limits.* New York: Open University Press", "Nel, E. & Nel, M. Hugo, A (eds.) (2012). *Learner support in diverse classrooms*. Pretoria: Van Schaik..."
Assignments/activities: "As a future teacher, the presentation of your work is a professional skill that you should develop right from the start. Unless otherwise specified, your assignments should be typed…"	*Assignments*: "…using these macro-perspectives, explain how…"

- **Appendix-6: Ethical approval/clearance**

WITS SCHOOL OF EDUCATION

UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG

SCHOOL OF EDUCATION ETHICS COMMITTEE

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

CLEARANCE CERTIFICATE	**PROTOCOL NUMBER: 2020ECE003M**
PROJECT TITLE	Curriculum design for online learning at one higher educational institution in South Africa.
INVESTIGATOR	THABISO IVAN MONYAU
SCHOOL/DEPARTMENT OF INVESTIGATOR	WITS SCHOOL OF EDUCATION
DATE CONSIDERED	20 July 2020
DECISION OF THE COMMITTEE	Approved unconditionally
EXPIRY DATE	Date of submission of the project report

ISSUE DATE OF CERTIFICATE 27 July 2020 **CHAIRPERSON** _____ (Dr Paul Goldschagg)

cc: Supervisor: Dr Nokulunga Ndlovu

The title of research project was changed from "*Curriculum design for online learning at one Higher Educational Institution in South Africa*" to "*Online learning instructional design facilitating participation, engagement, and interaction at a Higher Educational Institution in South Africa*." Therefore some appendices shall still be showing the initial title.

- **Appendix-7: Permission letter**



07 May 2020

Dear Thabiso Rantoana Ivan Monyau

Thank you for your inquiry seeking to undertake your Masters research study at the school.

Permission is granted for you to conduct your study at the [redacted] provided you obtain full ethics approval from the university.

With my very best wishes.



Professor F[redacted]M[redacted]
Professor of Higher Education and Head of [redacted]
Office Tel: [redacted]
Mobile: [redacted]
Email: [redacted]
Google Citations: https://[redacted]

- **Appendix-8: Facilitators' information sheet**

DATE: _____

Dear Sir/Madam

My name is Thabiso Rantoana Ivan Monyau I am a Master of Education student (MEd) in the School of Education at the University of the Witwatersrand. The title of my study is *Online learning instructional design facilitating Participation, Engagement, and Interaction (PEI) at a Higher Educational Institution in South Africa*. You will be directly involved in this study, I will be investigating how online learning instructional design of two online courses offered in a South African university facilitates students' and facilitators' PEI.

From the literature reviewed it is clear that there are limited studies that have been done on qualitative analysis from an instructor's or a learner's point of view regarding their active (or otherwise) experiences in an online learning, which may add value in preventing too much drop-outs or failures. Also less is said about online learning instructional design with regard to facilitating students' and facilitators' PEI.

Most studies appear to focus on delivering statistics and features of online learning while ignoring the facilitators' design and delivering of the instruction in an online learning platforms, especially with consideration to facilitating both students' and facilitators' PEI. I consider this to be a primary avenue to online learning instructional design based on constructivists' perspectives. My study will involve two facilitators for a single institution in Johannesburg. The facilitators have been purposely chosen based on online facilitation. The researcher intends interviewing these facilitators and doing document analysis of their course units for online learning regarding the courses each facilitates within a curriculum of one department.

The reason why I have chosen your school is because it has courses done online. I am humbly inviting you to participate in this study as one of the two lecturers to be interviewed and audiotaped during the interview, and do documentation analysis with their help. Your name and identity will be kept confidential at all times in the study. Your individual privacy will be maintained in all data resulting from the study. All research data will be destroyed after 3 years but not later than 5 years after I have completed my project. Your participation is voluntary, so you can withdraw your permission at any time during this project. There are no foreseeable risks except that of sharing information (found on documents) with the researcher that may be sensitive.

Please let me know if you require any further information. Thank you very much for your help.

Yours sincerely
Thabiso Monyau
Email: 2277362@students.wits.ac.za
Cell: 0787330589

- **Appendix-9: Facilitators' consent form**

By signing this form you agree to participate in the study. Please fill it in and return the reply slip indicating your willingness to be a participant in my voluntary research project called: ***Online learning instructional design facilitating participation, engagement, and interaction at a Higher Educational Institution in South Africa.***

I, _____ give my consent for the following:

Please *Circle YES or NO*

Permission to be interviewed

I would like to be interviewed for this study. **YES/NO**

I know that I can stop the interview at any time and do not have to answer all the questions asked. **YES/NO**

Permission to be audiotaped

I agree to be audiotaped during the interview. **YES/NO**

I know that the audiotapes will be used for this project only. **YES/NO**

Permission to participate in document analysis

I agree to share the information on the documents required if I feel it will be of value. **YES/NO**

I know that the information will be used for this project only. **YES/NO**

Informed Consent

I understand that:

- My name and information will be kept confidential and safe and that my name and the name of my school will not be revealed.
- I do not have to answer every question and can withdraw from the study at any time.
- I can ask not to be audiotaped.
- I can withhold any information regarding documentation.
- All the data collected during this study will be destroyed after 3 years but not later than 5 years after completion of this project.

. Sign_____ Date_____

- **Appendix-10: Students' information sheet**

DATE: _____

Dear Student

My name is Thabiso Rantoana Ivan Monyau. I am a Master of Education student (MEd) in the School of Education at the University of the Witwatersrand. The title of my study is *Online learning instructional design facilitating Participation, Engagement, and Interaction (PEI) at a Higher Educational Institution in South Africa*. My aim is to investigate how online learning instructional design of two online courses offered in a South African university facilitates students' and facilitators' PEI.

My research involves identifying and understanding instructional design practices used in online learning of two online course. I would like to issue you with a questionnaire to fill as part of the study. The questionnaire is voluntary, but it is my humble request for you to assist by completing it. Your name or any form of identification shall not be shown in the questionnaire or the findings of the study. All information about you will be kept confidential in all my writing about the study. Also, all collected information will be stored safely and destroyed after 3 years but not later than 5 years after I have completed my project. Your decision to participate will be highly appreciated.

I look forward to working with you. Please feel free to contact me if you have any questions.

Yours sincerely
Thabiso Monyau
Email: 2277362@students.wits.ac.za
Cell: 0787330589

- **Appendix-11: Students' consent form**

By signing this form you agree to participate in the study called:
Online learning instructional design facilitating participation, engagement, and interaction at a Higher Educational Institution in South Africa.
Please fill in the form and return it to the researcher.

My name is: _____

Please *Circle YES or NO*

Permission to be issued with a questionnaire

I agree to be involved in the questionnaire processes, while the researcher is conducting this study. **YES/NO**

I know that the information will be used for this project only. **YES/NO**

I know that I can stop giving information at any time and I don't have to participate if I don't feel like to. **YES/NO**

Informed Consent

I understand that:

- My name and information will be kept confidential and safe and that my name and the name of my school will not be revealed.
- I do not have to participate if I don't feel like to and I can withdraw from the study at any time.
- All the data collected during this study will be destroyed after 3 years but not later than 5 years after completion of this project.

Sign_____ Date_____