

**Facilitating learning in a *Second Life*<sup>™</sup> classroom:  
the case of the University of the Free State**

by

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## Declaration

I, Jacoba Danilina Liebenberg, declare that the study hereby submitted for the Philosophiae Doctor in Higher Education Studies in the Faculty of Education, University of the Free State, is my own independent work and that I have not previously submitted this work, either as a whole or in part, for a qualification at another university or at another faculty at this university. I also hereby cede copyright of this work to the University of the Free State.

*JD Liebenberg*

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## LIST OF ACRONYMS AND ABBREVIATIONS

AL	-	Action Learning
AR	-	Action Research
ALAR	-	Action Learning Action Research
API	-	Application Program Interface
DNA	-	Deoxyribonucleic Acid
ICT	-	Information and Communication Technology
POV	-	Point of View
RAM	-	Random Access Memory
SANReN	-	South African Research Network
SLURL	-	Second Life Uniform Resource Locators
VoIP	-	Voice over Internet Protocol
UFS	-	University of the Free State
WWW	-	World Wide Web

## SUMMARY

Technology has been observed re-shaping higher education globally, but the speed thereof frequently outruns the capability of higher education facilitators to integrate technological tools into learning facilitation practices. Furthermore, Africa as a developing continent, often trails the rest of the world when it comes to adopting innovative technology in higher education learning facilitation. Considering both the preceding challenges the declared aim of this study was to explore how learning can be effectively facilitated in a *Second Life*<sup>™</sup> classroom at an African University. Learning facilitation in *Second Life*<sup>™</sup> is taking place at universities globally, but not in Africa. Therefore, there is a huge knowledge gap about learning facilitation in *Second Life*<sup>™</sup> in Africa, the African learning experience in *Second Life*<sup>™</sup> and learning theories specifically for learning in *Second Life*<sup>™</sup>.

An eclectic theoretical framework was used to guide this study. It consisted of three groups of theories, namely Action Learning Action Research, the Virtual World Adjustment Theory and relevant online learning theories. The integration of these led to an adapted Virtual World Adjustment theory of learning, one of the contributions of this study.

The exploration of the *Second Life*<sup>™</sup> learning landscape commenced with the literature review as non-empirical research. This flowed into the empirical research of content analysis whereby a document analysis was performed on the web pages of all the higher education institutions in the world, facilitating learning in *Second Life*<sup>™</sup>. This yielded qualitative and quantitative data from a census of these institutions. Key features explored were namely, the geographical distribution of higher education institutions that facilitate learning in *Second Life*<sup>™</sup> globally; the type of university, whether private or public; student enrolment size; the design of the classrooms; facilitation foci; and facilitation methods. These features were noted and analysed. Findings showed that most higher education institutions facilitating learning in *Second Life*<sup>™</sup> are from developed continents, mainly public universities, and are of medium size in terms of student enrolment numbers. Most

of these institutions still prefer facilitation methods similar to traditional classroom learning. Higher education, research, and education are the main facilitation foci in *Second Life*<sup>™</sup>, with classroom design leaning towards the non-traditional outlay.

The study then progressed to the empirical research of the *Second Life*<sup>™</sup> learning experience of students. An Action Learning Action Research-guided methodology was followed whereby a small-scale project in *Second Life*<sup>™</sup> at an African university was created to explore the students' learning experience. Voluntary convenience sampling was used to select research participants from first-year students registered for English Academic Literacy at the University of the Free State. Action Learning Action Research advanced from the planning to the preparation for the small-scale project. Thereafter, the action took place with the orientation of students, the learning facilitator and the university Information and Communication Technology (ICT) staff to render services during the project. This was followed by the learning facilitation sessions in a traditional classroom and in *Second Life*<sup>™</sup>. Pre- and post-test scores were recorded from the tests written by students before and after learning facilitation took place in the face-to-face and *Second Life*<sup>™</sup> classrooms. After the learning facilitation sessions, a nominal group discussion was conducted with the student participants; ethnographical narratives were solicited from the students; and a reflection from the learning facilitator was collected.

The resultant qualitative data from the observations, nominal group discussion and ethnographical narratives, as well as the complementing quantitative data from the test scores served the purpose of triangulation in this study. The test results from the students showed that learning happened in *Second Life*<sup>™</sup>. From the observations made, the students demonstrated that they acquired knowledge by interacting and debating in this domain. In the ethnographical narratives, the students commented on the learning experience that they had in *Second Life*<sup>™</sup> and that learning there was neither dreary nor mundane. From the nominal group discussion, it became evident that the exploration engaged them. Also, in the discussion the reservation was expressed by the students that the ownership of devices might be the greatest factor hampering fluent learning in *Second Life*<sup>™</sup>.

Based on the preceding findings and the reflection of the researcher, a set of markers was compiled to guide effective learning facilitation in a *Second Life*<sup>™</sup> classroom at an African University. The study also contributed by proposing an adapted Virtual World Adjustment Theory. In addition, this study fills the research gap on learning facilitation in *Second Life*<sup>™</sup> in the African higher education context.

**Keywords:** higher education, learning facilitation, learning experience, virtual worlds, *Second Life*<sup>™</sup>

# CHAPTER 1

## ORIENTATION TO THE STUDY

### 1.1 Introduction and background

The increased usage of technology in higher education learning facilitation is a focal point globally (UNCTAD, 2021; Xing & Marwala, 2017). The benefits of technology regarding the learning experience are widely supported (Waghid & Waghid, 2018) but the effectiveness to ensure deep learning is questioned at times (Basar, Mansor, Jamaludin & Alias, 2021; Castaneda & Selwyn, 2018). Nonetheless, technological innovation re-shapes higher education all over the world (Pirker, Riffnaller-Schiefer, Tomes & Gutl, 2016). However, Sutton and DeSantis (2017) state that the speed of technological innovation frequently outruns the capability of higher education learning facilitators to integrate contemporary tools with their learning facilitation practice. Furthermore, Africa often trails the rest of the globe when it comes to adopting innovative technology in facilitating learning in higher education (Fomunyam, 2020). Together herewith, internet connectivity penetration in Africa remains low (The World Bank, 2022).

When facilitating learning in higher education in a developing continent is debated, it also needs to be remembered that Millennials and Generation Z students are filling most of the continent's education seats – with Generation Alpha less than a decade away from these seats (McCrindle, 2022; Pinsker, 2020); just as in the rest of the world. Therefore, the way that these generations learn needs to be considered when the facilitation of learning in higher education is debated. Millennials and Generation Z students, and the upcoming Generation Alpha, do not only use technology; they embrace it. Technology and its immediacy are embedded in, and enmeshed with, their daily lives (Fink, 2021). It is therefore a natural outflow that they will favour interactive and real-time learning facilitation within the higher education context. This aptitude of theirs often clashes with the lack of immediacy of current learning management systems used in higher education and leads to the critique of present learning facilitation methods. Therefore, learning facilitation in higher education needs to be re-

thought on how students learn and should keep up with technological innovation; also, in developing continents.

With this re-thinking in mind, it also needs to be remembered that higher education learning facilitation is taking place in a world where the real world is no longer the only reality (Besecker, 2015). Since the establishment of the World Wide Web in 1989, reality has changed. Virtual reality has become an adjacent and simultaneous reality to what was known as the established reality. Virtual reality is a widely defined concept, but this study will use the definition of the Gartner Glossary (Gartner, 2022) that virtual reality provides a computer-generated three-dimensional environment that surrounds users and responds to the actions of individuals in a natural way. One type of virtual reality is fully immersive virtual worlds. Virtual worlds are “shared, simulated spaces which are inhabited and shaped by their inhabitants who are represented as avatars” (Girvan, 2018:1099). Furthermore, virtual worlds should not be confused with games, because encounters in virtual worlds do not conclude in winning or losing, as games do. In virtual worlds avatars perform activities that humans do in real life, such as eat, sleep, shop, hang out and attend educational activities.

Different numbers are given for the number of virtual worlds that exist. For this study, virtual worlds are categorised into four groups, namely Blockchain Browser Virtual Worlds, Blockchain Virtual Worlds in Virtual Reality, Browser Virtual Worlds and Virtual Worlds in Virtual Reality and there are 99 virtual worlds in these four categories (MetaVersed, 2022). One of the Browser Virtual Worlds, namely *Second Life*<sup>TM</sup> is regarded as the most developed, stable, and mature web-based platform to host multi-user activity for higher education learning facilitation (Virtual Reality Society, 2022). *Second Life*<sup>TM</sup> offers a situated experience, identity creating opportunities and a mediated presence<sup>1</sup> (Yu, Hsieh & Chang, 2017) to students. These three offerings are key experiences to student success when learning occurs in virtual environments. Learning facilitation in *Second Life*<sup>TM</sup> is currently taking place in 152 higher education institutions globally (Linden Lab, 2022), compared to 148 higher education institutions in 2017. Despite challenges, such as technical problems (Kruk, 2017), cost incurrence (Virtual Ability, 2022), additional investment of time (Voyager, 2018), virtual identity

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<sup>1</sup> Social presence, co-presence and self-presence constitute mediated presence.

dilemmas (Rudra, Jæger & Ludvigsen, 2018) and cultural shock (Grant, Huang & Pasfield-Neofitou, 2018), universities globally welcome the easy access to educational resources, flexible learning activities as well as the combination of imagination and reality that *Second Life*<sup>TM</sup> brings to higher education learning facilitation (Gong, 2018). They value *Second Life*<sup>TM</sup> for authentic learning (Gregory & Wood, 2017), self-directed learning (Fardinpour, Reinders & Wood, 2018), collaboration enhancement (Thorne & Macgregor, 2018), learner engagement (Henderson, Henderson, Grant & Huang, 2018), being an ideal medium for the transfer of knowledge to real-life situations (Gregory & Wood, 2017) as well as for the fostering of intercultural competence and online educational communities of practice (Corder & U-Mackey, 2018).

Although *Second Life*<sup>TM</sup> is valued for the possibilities it has for higher education learning facilitation, no university in Africa has an institution-wide presence in this domain (Linden Lab, 2022). There is evidence of sporadic, individual attempts by academics in Africa, specifically in South Africa, who have experimented with the technical creation of classrooms in *Second Life*<sup>TM</sup><sup>2</sup>. Furthermore, a huge knowledge gap is evident, as scarcely any study could be found that focused on the learning experience in *Second Life*<sup>TM</sup> in Africa. The closest study to the topic of facilitating learning in higher education in *Second Life*<sup>TM</sup> in (South) Africa was the mini dissertation of Mandla (2013), titled: *Second Life: a support teaching methodology for entrepreneurship at NMMU for MBA students* (SANReN, 2022). This study explored the opinions, perceptions, and assumptions of students on the benefits of teaching entrepreneurship for MBA students in *Second Life*<sup>TM</sup> in South Africa. Because no evidence of higher education institution-wide presence in *Second Life*<sup>TM</sup> in Africa, or research on the learning experience of students from Africa in this domain, could be located, the researcher was inspired to create and investigate the learning experience of students in Africa in this domain. In this research, specific focus is placed on the University of the Free State (UFS) in South Africa.

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<sup>2</sup> An example is a Computer Science module within the discipline of Information Systems and Technology at the University of KwaZulu-Natal (UKZN), in which students had to create a *Second Life*<sup>TM</sup> classroom. This was not a university-wide initiative, but a discipline-specific investigation by Rosemary Quilling (aka Resomyra Felwitch in *Second Life*<sup>TM</sup>) and Prof Craig Blewett of UKZN (Quilling, 2017).

## 1.2 Research problem and research questions

The vision of this study and the potential contribution that it can make are perceived as the reshaping of higher education learning facilitation in the developing continent of Africa through *Second Life*<sup>™</sup>. The research problem, research questions, aim and objectives, discussed below, are closely tied to the broader vision and the contribution of this study.

### 1.2.1 Research problem

Acholonu and Njie (2020) argue that African universities need to seek flexible learning opportunities to improve lagging educational systems and learning facilitation in higher education. The Millennials and Generation Z also exert pressure to change in favour of interactive and real-time facilitation within the online higher education context (Coman, Tiru, Mesesan-Schmitz, Stanciu & Bularca, 2020). Furthermore, since the emergence of Covid-19, universities had to venture into creative ways of learning facilitation and still service all their students (Lee, 2021). This is especially true for international students often restricted from travelling, by countries imposing lockdowns to prevent the spread of Covid-19. Additionally, the Fourth Industrial Revolution brought artificial intelligence, big data, the Internet of Things, digital platforms, 3D printing and especially augmented and virtual reality to every part of society (Penprase, 2018; RegInsights, 2020). All the afore mentioned highlighted the necessity to remodel the facilitation of learning in higher education in Africa.

### 1.2.2 Research questions

This research problem led to the main and overarching research question, namely:

*How can learning in a Second Life<sup>™</sup> classroom be effectively facilitated at an African University?*

To investigate the main research question, the following four (4) secondary research questions were formulated:

1. *What are the constituents of an appropriate theoretical framework for the facilitation of learning in Second Life<sup>™</sup> at an African University?*

2. *What are the key features of the landscape associated with learning facilitation in Second Life™ classrooms at higher education institutions globally?*
3. *What is the learning experience of students in a Second Life™ classroom at an African University?*
4. *What markers can be proposed to effectively facilitate learning in a Second Life™ classroom at an African University?*

### **1.3 Research aim and research objectives**

The aim and objectives of the research are based on the main research question and the secondary research questions of this study, respectively.

#### **1.3.1 Research aim**

The research aim of this study was:

*To explore how learning can be effectively facilitated in a Second Life™ classroom at an African University*

#### **1.3.2 Research objectives**

To fulfil the aim of the research, four (4) research objectives were formulated to address the four (4) secondary research questions outlined in section 1.2.2. They were:

1. *To adapt the Virtual World Adjustment Theory with the integration of relevant constituents to guide the exploration of facilitating learning in Second Life™ at an African University*
2. *To undertake an analysis of the key features of the world's higher education institutions with an active learning facilitation presence in Second Life™*
3. *To explore the students' learning experience at an African university through the creation of a small-scale project of learning facilitation in Second Life™*
4. *To compile a set of markers to guide effective learning facilitation in a Second Life™ classroom at an African University.*

To fluently probe the aim and objectives of the research, the terms often used in this study are clarified in the next section.

## 1.4 Clarification of terms

Frequently used terms in this study are clarified in Table 1.1 below to provide a common understanding of these terms and their meanings.

**Table 1.1: Terms used in this study (Drew, 2022; Linden Lab, 2022; Malamed, 2022; Savin-Baden, 2010)**

Term	Meaning of the term
<b>Avatar</b>	An avatar is an impersonation of a citizen in <i>Second Life</i> <sup>TM</sup> . This representation is controlled by a human, using an input device like a keyboard and other specifically designed command and simulation gadgets. An avatar differs from a bot, or a chat bot, which refers to an animation under the control of third-party software or computers.
<b>Digital strangers</b>	Digital strangers are associated with developing continents. They are students lacking digital experience and opportunities, but not because of age. They have hardly ever used a computer and have had difficulty with access to technology off campus.
<b>Effective facilitation</b>	Effective facilitation implies that the learning facilitation process led to learning occurring in students. Effective facilitation in <i>Second Life</i> <sup>TM</sup> includes the advantages that accompanies learning facilitation in <i>Second Life</i> <sup>TM</sup> (see section 3.6.4).
<b>Facilitating learning</b>	The focus in facilitating learning is on the noun of this word compound, namely learning. This term has a shifted focus compared to learning facilitation where facilitation is the focal point. Facilitating learning in this study means the process that leads to change, which is a result of experience and betters the possibility for improved performance and future learning.
<b>Fly</b>	An avatar can fly in <i>Second Life</i> <sup>TM</sup> . An avatar is not bound by gravity and can fly backward or forward, up, or down.
<b>Inworld</b>	Inworld is often used as a synonym for being present in a virtual world. Inworld implies that a web-user or avatar is logged into a virtual world.
<b>Island</b>	Islands consist of regions and are detached from the mainland in <i>Second Life</i> <sup>TM</sup> . Islands can only be reached through teleporting.
<b>Land</b>	Land refers to a geographical area in <i>Second Life</i> <sup>TM</sup> . Land is categorised according to size. The smallest area of land in <i>Second Life</i> <sup>TM</sup> is called a parcel and is usually 16 m <sup>2</sup> . Several parcels form a region, which equates to 256 m x 256 m (65 536 m <sup>2</sup> ) and regions are situated on islands. Land can be bought or rented from Linden Lab and are managed directly by the owners or renters of the islands.
<b>Landscape</b>	Landscape in this study refers to the geographical positioning, nature of independence (meaning public or private university), and student enrolment numbers of higher education institutions, globally. Landscape also includes the design of the learning

	facilitation spaces in <i>Second Life</i> <sup>™</sup> , as well as subject field preferences and learning facilitation methods often used (see section 4.3).
<b>Learning facilitation</b>	Learning facilitation in this study means the centre of learning is moved to the student, without the perception that knowledge is centred in the facilitator. Learning is rather facilitated within students by a facilitator. Although students are at the centre of learning, learning facilitation is still a guided process built on sound learning theory, pedagogy, and methodology.
<b>Linden Lab</b>	Linden Lab is a virtual world technology company based in San Francisco. This company created and continues to maintain <i>Second Life</i> <sup>™</sup> .
<b>Markers</b>	Markers usually indicate position and routes, and markers mean a set of guidelines or route to learning in this study.
<b>Reshaping</b>	Reshaping in this study means that alternative modes of delivery are formed in higher education to ensure effective facilitation. Reshaping further means the transforming of higher education by means of <i>Second Life</i> <sup>™</sup> platforms that address the needs and challenges of Millennial and Generation Z students, as well as the upcoming Generation Alpha.
<b><i>Second Life</i><sup>™</sup></b>	<i>Second Life</i> <sup>™</sup> is an internet-based, 3D virtual realm that was conceived by Linden Lab. <i>Second Life</i> <sup>™</sup> is a Browser Virtual World, trade-marked and one of numerous virtual worlds that exist. Residents continuously generate content in <i>Second Life</i> <sup>™</sup> by creating their own identity inworld, meeting other people (avatars), buying, or renting land, and building their own environment. <i>Second Life</i> <sup>™</sup> offers web-users carte blanche to build, compose and interact as they want (see section 3.6.2).
<b><i>Second Life</i><sup>™</sup> classroom</b>	A <i>Second Life</i> <sup>™</sup> classroom in this study refers to a virtual classroom that resembles a traditional face-to-face classroom in real-life. The choice of a traditional classroom was motivated to avoid the cultural shock that students experience when they must learn in new environments (see section 2.4.3). A traditional classroom in <i>Second Life</i> <sup>™</sup> in this study mirrors the known in the unknown.
<b>Teleport</b>	Teleport is a mechanism that allows for an immediate change of location inworld, independent of the distance between the locations. It is one of the leading ways of travelling or re-locating in <i>Second Life</i> <sup>™</sup> .
<b>University of the Free State</b>	University of the Free State is a public university located at the centre of South Africa. It is an example of an African university. Therefore, the empirical research at this university enhances the potential of applicability in Africa because an African perspective is sought. Take note of section 2.2.3 which embeds the African Theory of Knowledge into the theoretical framework of this study.
<b>Virtual Worlds</b>	Virtual worlds refer to device-based online community environments. Users in virtual worlds are called avatars and are represented on-screen as representations of themselves. They interact in real time with other users in virtual worlds.

Connected to the clarification of terms often used, an explanation of the assumptions that guided the study follows.

## 1.5 Research assumptions

Cohen, Manion and Morrison (2017) indicate that researchers interpret social reality in different ways because they have varying assumptions regarding the acquisition of knowledge and the nature of humankind. They refer to four sets of assumptions regarding social reality, namely ontological-, epistemological-, anthropological- and methodological assumptions. The assumptions of this study are discussed below.

### 1.5.1 Ontological assumptions

Ontological assumptions are beliefs about the essence of reality and social phenomena as either of objective nature (Positivism) or because of individual cognition (Post Positivism). For this study, the ontological assumptions are that the world consists of human beings who construct their own thoughts, meaning and interpretation. Reality is believed to consist of created meanings from a social world, never fully comprehended and with many truths. Furthermore, the researcher believes that the world can only be understood from the viewpoint of the individuals who are part of the ongoing action under investigation. It is thus clear that the ontological assumptions of this study are Post Positivist, which can be further sub-categorised into Interpretivism, Criticism, Pragmatism or Realism. Interpretivism, the lens of this study, believes that reality is constructed by peoples' subjective sense of the real world and the meaning that they attribute to it (Deetz, 1996). Knowledge is viewed as an act of interpretation by humans and not objective or distant from the reasoning of humans. Post Positivist approaches are open to different methodological approaches, often including both qualitative and quantitative research methods. This allows for information to be sought in creative ways by means of alternative research strategies, such as Action Research (Cohen, et al., 2017; Creswell & Creswell, 2018). This study focuses on the authentic, first-person experiences, knowledge and interpretations of the researcher and the participants. This study acquires an in-depth understanding of the learning experience in a *Second Life*<sup>TM</sup> classroom in Africa by valuing the meaning, viewpoints, feelings, inner thoughts and interaction of the researcher and the participants.

### **1.5.2 Epistemological assumptions**

Epistemological assumptions reflect the philosophy of the researcher regarding acquiring and communicating knowledge and truth to others (Creswell & Creswell, 2018). The epistemological assumptions of this study are that the researcher must be involved, and interact with, the research participants to acquire knowledge and to be able to communicate the researched to others. The relationship of the researcher with what is being studied is crucial and it is further believed that the real world does not exist, or pre-existed, separate from human activity of symbolic attributions. The interactions and engagement, together with ethnographical reflections from the participants, in this study assisted with the setting of markers to guide effective learning facilitation at a *Second Life*<sup>™</sup> classroom at an African University. The researcher was convinced that facilitation had to take place in a *Second Life*<sup>™</sup> classroom at the University of the Free State in Africa to fulfil the aim and vision of this study.

### **1.5.3 Anthropological assumptions**

Anthropological assumptions indicate the beliefs that the researcher has about the relationship between humans and their environment, reflecting Determinism or Voluntarism (Burrell & Morgan, 1979). This study holds to assumptions from Voluntarism that posit that humans create their own actions shaped by their choices, volitions, and feelings. It is important that individuals should have the freedom of choice to independently act and live their free will (Baron, 1997 in Bouzanis, 2022). Another anthropological assumption of this study is that the learning of the participants is not controlled by the *Second Life*<sup>™</sup> environment. What is rather true, is that the participants are co-constructors of *Second Life*<sup>™</sup> and they construct knowledge within learning facilitation situations in *Second Life*<sup>™</sup>.

## **1.6 Demarcation of the research**

To explore how learning can be effectively facilitated in a *Second Life*<sup>™</sup> classroom at an African University, limits the study to i) higher education learning facilitation, ii) the specific virtual world of *Second Life*<sup>™</sup> and iii) the African context.

Regarding i) higher education learning facilitation, the focus of this study intersects with the current themes and issues in higher education learning facilitation. They are highlighted as virtual reality for education, embracing artificial intelligence for learning and higher prevalence of online learning (Bouchrika, 2020); growth in importance of advanced technologies in learning, flexible learning options, as well as the importance of innovation for learner and institution success (Eiffelcorp, 2022); replacing of lectures with active learning and learning from anywhere (World Economic Forum, 2022). The aim of this study is closely linked to these current themes and issues in higher education learning facilitation.

The demarcated ii) virtual world of *Second Life*<sup>TM</sup> in this study is described as an ideal medium for the transfer of knowledge to real-life situations. *Second Life*<sup>TM</sup> is perceived as the most mature of virtual worlds to handle higher education learning facilitation (Gregory & Wood, 2017). Most higher education institutions that engage in learning facilitation in virtual worlds use *Second Life*<sup>TM</sup>. Because *Second Life*<sup>TM</sup> is a Browser Virtual World (MetaVersed, 2022), it has evolved through numerous versions already and presents a stable platform to engage in learning. Therefore, the choice was made to use this specific virtual world in this study and not any of the other existing virtual worlds, thus the study is limited to *Second Life*<sup>TM</sup>.

The study focuses only iii) on the developing continent of Africa because of the void from this continent in the global higher education *Second Life*<sup>TM</sup> learning facilitation sector. Furthermore, the empirical research and the researcher are situated in Africa, hence the African Theory of Knowledge (see section 1.7) provides an African perspective to the study.

## 1.7 Theoretical Framework

A theoretical framework indicates the theory that a study uses as structure to comprehend, critique, and interpret the phenomena being explored (Creswell & Creswell, 2018). The complexity of choice of a theoretical framework for this study arose from limited theories that exist on virtual learning. Even more so is the absolute scarcity on *Second Life*<sup>TM</sup> learning theories. In search for an applicable learning theory for this study the opinion of Flynn, Jalali and Moreau (2015) is acknowledged that

learning theories are fundamental to the development of sound pedagogy. Therefore, the researcher concurs with the implication of this statement that learning theories are just as much key to sound pedagogy in digital learning environments.

The array of digital learning theories developed from the three traditionally clustered learning theories of Behaviourism, Cognitivism and Constructivism were considered. Constructivism is student-centred and learning happens through action, which applies to this study. Prominent derivative digital learning theories from Constructivism are the Social Development Theory (Vygotsky, 1978), Communities of Practice Theory (Lave & Wenger, 1991), Discovery Learning Theory (Bruner, 1961) and Cognitive Apprenticeship Learning Theory (Collins, Brown & Holum, 1991). They subscribe to the fundamental elements of Constructivism that knowledge is constructed, rather than transmitted (Behaviourism) or acquired (Cognitivism). The research of Picciano (2017) for an online integrated model as well as transgressive and progressive teaching and critical pedagogy by bell hooks and Paulo Freire (Fazzolari, 2022) were considered.

This study resonates with Constructivism and its derivate digital learning theories, but because of the complexity of this study, the identified gap of theories of learning specific to *Second Life*<sup>™</sup> learning, combined with the pre-conceived cultural shock (*óngoing* cultural, shock from the perspective of Freire) that learning in this domain will bring to students in a continent absent in *Second Life*<sup>™</sup>, a further combination and integration of theories had to be explored. Therefore, the decision was made to use an eclectic theoretical framework for this study.

An eclectic theoretical framework is not committed to one theoretical framework only (Kulkova, 2019), because it selects from various applicable theories to explain the researched phenomena. The eclectic theoretical framework for this study is depicted in Figure 1.1 showing how three groups of theories, namely Action Research Theory (Zuber-Skerritt, 2011; Zuber-Skerritt, 2016; Zuber-Skerritt & Wood, 2019), specifically Action Learning Action Research (ALAR); the Virtual World Adjustment Theory (Fizsimons, 2012); and online learning theories were linked and how they speak directly to the aim of the study to explore how learning can be effectively facilitated in a *Second Life*<sup>™</sup> classroom at an African University.

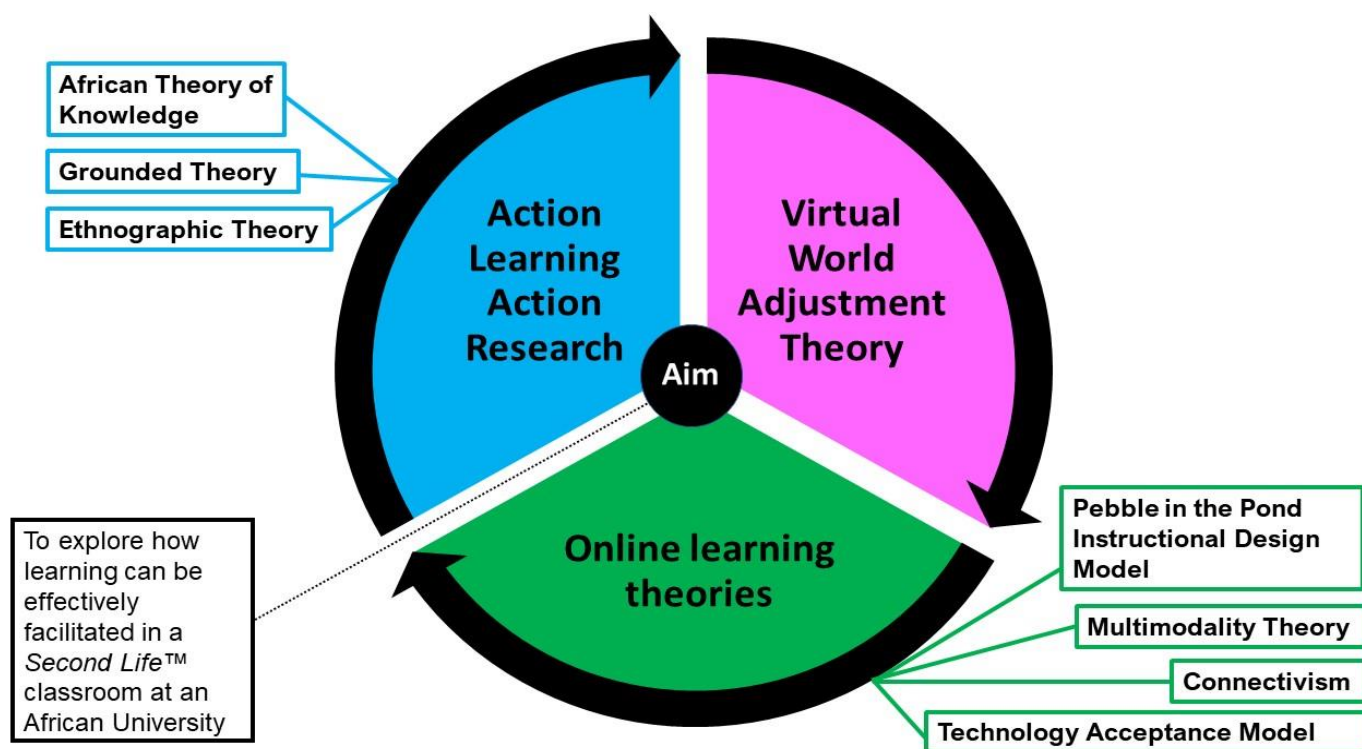


Figure 1.1: Integrated, eclectic theoretical framework (Liebenberg,2022)

The Virtual World Adjustment Theory (Fizsimons, 2012) plays a very important role in this eclectic theoretical framework, because this was one of the few online theories that exclusively focused on virtual world learning that could be located by the researcher (Bodily, Leary & West, 2019). Because of the student-centredness and the actioning of learning, it derives from the traditional Constructionism (see section 1.7), the Virtual World Adjustment Theory comments specifically on the active process of learning within virtual worlds. This theory is also deeply vested in cultural change and cultural shock (Ward, Bochner & Furnham, 2001) which is true for newbies<sup>3</sup> in *Second Life*<sup>™</sup>. But limitations were identified in this theory which asked for an adaptation by the researcher. The modification to this recent theory is explained in detail in Chapter 2. Constituents from the online learning theories, namely the Pebble-in-the-Pond Instructional Design Model (Merrill, 2002), the Multimodality Theory (Bernsen, 2008), Connectivism (Siemens, 2005) and the Technology Acceptance Model (Davis, 1989), were integrated into the Virtual World Adjustment Theory (see Chapter 2). This

<sup>3</sup> Newcomers to *Second Life*<sup>™</sup> are called newbies (Linden Lab, 2022)

adapted Virtual World Adjustment Theory lays the foundation for the subsequent chapters of this study and was done to work towards the aim of this study, namely, to explore how learning can be effectively facilitated in a *Second Life*<sup>™</sup> classroom at an African University.

Action Research, specifically Action Learning Action Research (ALAR), guided the exploration on how learning can be effectively facilitated in a *Second Life*<sup>™</sup> classroom at an African University. “Action Research builds on the past, takes place in the present, with a view to shaping the future” (Zuber-Skerritt & Wood, 2019:14). Action Research is deemed a philosophy, a theory of learning, a methodology and a facilitation process of learning which is practical, participative, and critical (Zuber-Skerritt & Wood, 2019). The critical perspective of Action Research links to the research of bell hooks and Paulo Freire (Fazzolari, 2022).

The aims of Action Research are two-fold. Firstly, Action Research wants to improve practice, together with contributing to the conceptual and practical knowledge available. And this is done by understanding a situation in its complexity. This study is in essence driven by the aims of Action Research, because it wants to improve the learning facilitation practice and learning in Africa; it wants to better the knowledge of an alternative form of learning in Africa; and this study happens from within the complexity of the African higher education domain. Secondly, Action Research states that if warranted, positive changes can be made to a specific environment in which the practice takes place, leading to development. This study shares exactly this belief, since it is mentioned in section 1.8 that the change is only warranted with a viability study. If not warranted, then this study helped to save further resources and exploration of this avenue for learning in Africa. If potential is recognised for learning, and positive change for learning in Africa, then further research is recommended (see section 6.8.4).

Action Learning happens when people identify their own challenges, create their own solutions, and learn through action, concrete experience or from one another (Zuber-Skerritt & Wood, 2019). Hereupon, they then take further action. Action Learning is not limited by culture, language, or tradition. This type of learning is usually enriching, increase self-confidence and give a new sense of direction accompanied by new skills,

awareness and being equipped. Action Learning leads to praxis from practice (action) and theory (learning) (Zuber-Skerritt, et al., 2015). In Action Learning Action Research (ALAR), a spiral of cycles drives the research process. Each cycle of action encompasses four major phases, namely to i) plan, ii) act, iii) observe and gather data and iv) reflect on the plan, the action, and the gathered data. *Planning* deals with the identification and definition of a problem and analytically preparing a strategic plan. With the *action*, the strategic plan is implemented. *Observation* means that the action that was taken, is evaluated by appropriate research processes. *Reflection* implies that the researcher thinks back in a critical way on the plan, the action and evaluation (Zuber-Skerritt & Wood, 2019). From the reflection of one action research cycle the vision of the next action research cycle evolves, usually culminating in Grounded Theory. For this study the meaning of Action Learning Action Research is linked to the explanation of Zuber-Skerritt and Wood (2019) that this type of design is cyclical, deeply reflective, critical, self-evaluating and participatory. In this study, new knowledge was created by action learning. Therefore, Grounded Theory is strongly associated with the setting of markers to guide effective learning facilitation at a *Second Life*<sup>TM</sup> classroom at an African University.

Also, to be noted is the African Theory of Knowledge (Aja, 2015; Quampah, Samuel, Fidelis & Samuel, 2016) because the aim of the study is firmly related to the developing continent of Africa. Furthermore, the Ethnographic Theory (Malinowski, 1944) and Grounded Theory (Brown, 2019) are incorporated into the Action Learning Action Research of this study because of the new knowledge creation in this study. Therefore, they are discussed as sub-sections of Action Learning Action Research in Chapter 2.

The eclectic theoretical framework with the theories underlying this study is discussed in more detail in Chapter 2. In the next section, it becomes clear how the theoretical framework, and specifically ALAR, guided the design of this study.

## **1.8 Research design and methodology**

The research design of a study sets the strategy of how the research is to be done and it is driven to address the research aim effectively (Cohen, et al., 2017; Sileyew,

2019). Research methodology elaborates on how this planned strategy is executed and demarcates the data to be collected, how it will be gathered and what will be done to ensure valid and reliable results that address the research aim and questions (Jansen & Warren, 2020). The eclectic theoretical framework of this study (see section 1.7) gave rise to, and informed, an Action Learning Action Research-guided design. This research design is theory-in-use, namely what the researcher does, in contrast to espoused theory whereby it is being said what must be done. ALAR must be practiced and done, rather than read, told, or lectured about (Zuber-Skerritt in Zuber-Skerritt & Wood, 2019). The participants and researcher must personally experience and reflect on their practices, emotions, views, and reactions to create personal constructs and at times Grounded Theory (Bryant & Charmaz, 2007; Dick, 2007; Zuber-Skerritt, 1992).

The Action Learning Action Research-guided design adopted in this study was inspired by the Figure Eight model for the planning of Action Research projects (Zuber-Skerritt, 2002:145; Zuber-Skerritt, 2019:200). The Figure Eight model was applied in a learner-centred, problem-orientated educational context (see section 3.6.4.5 and section 3.6.4.12) by Zuber-Skerritt in Zuber-Skerritt and Wood (2019). The Figure Eight model is of the viewpoint that learning happens within real-life, is inclusive and must be accessible to all. Learning is believed to be informal and self-directed, based in a contemporary cultural context. Communities of learning, collaboration and cooperation are seen as key to learning. This Action Learning Action Research-guided design inspired by the Figure Eight model served as foundation of the thinking of the researcher and led to the customised model for this specific study. This customised model is positioned next to the Zuber-Skerritt (2019:200) Figure Eight model (see Figure 1.2).

Although the Figure Eight model and the customised Action Learning Action Research model are largely different in terms of the processes followed, the corresponding features can be recognised. Both models visualise the context first, using strategies to do so. The Figure Eight model uses a stakeholder-, SWOT- and resource analysis to sketch the context. In the customised model, the strategic role to sketch the context was done by the literature review (see Chapter 3) and insights from the literature review led to the creation of a checklist for course creation (see section 3.6.6.6) in

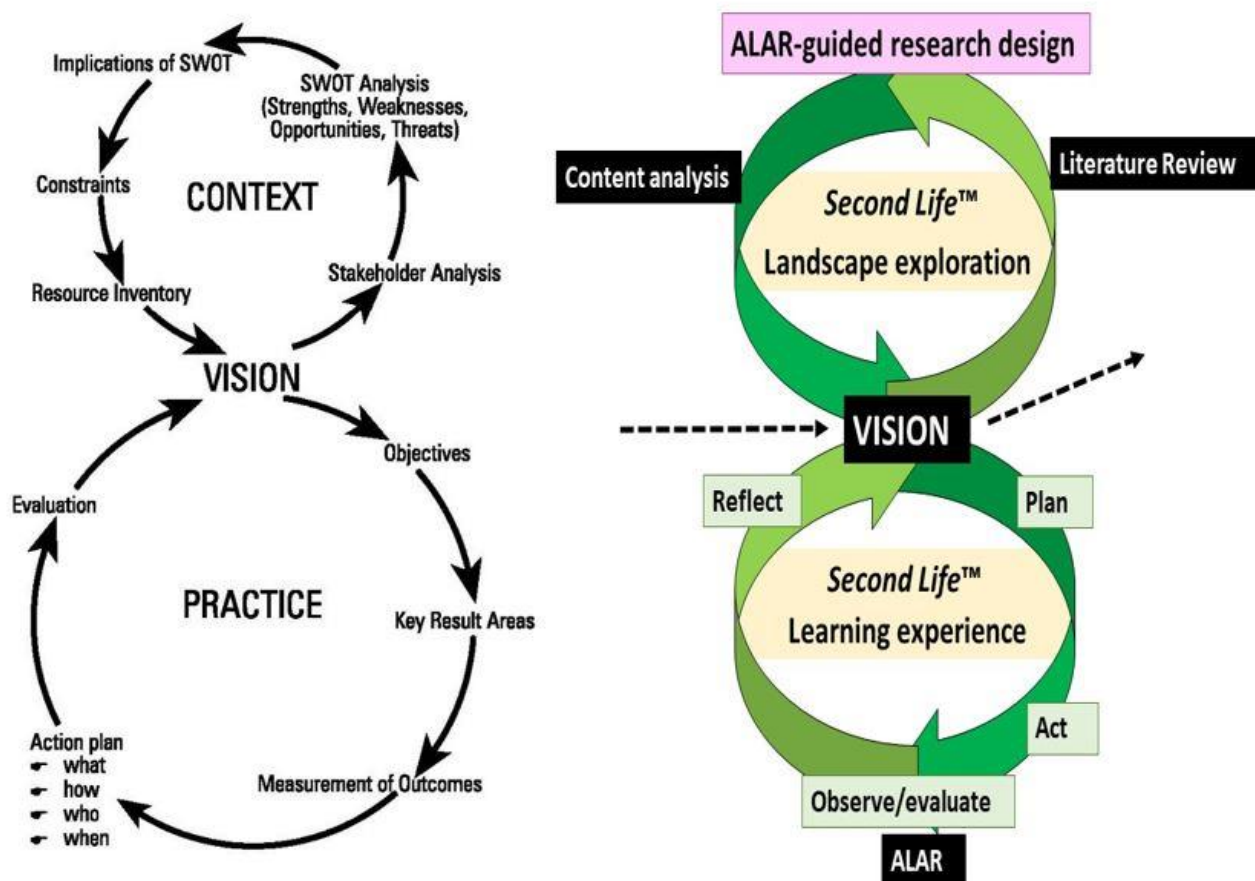


Figure 1.2: Figure Eight model for planning Action Research (Zuber-Skerritt & Wood, 2019:200) with the customised model used in this study to the right side of the Figure Eight model (Liebenberg, 2022)

*Second Life™* (Liebenberg, 2022) and a table of contents for a proposed manual to orientate students (see section 3.6.6.10) in *Second Life™* (Liebenberg, 2022). In addition, the context analysis was performed by a content analysis (see Chapter 4) to evaluate the landscape (see section 1.4), namely the geographical location of higher education institutions globally with an institutional presence in *Second Life™*; their nature of independence (public or private university); student enrolment numbers (size); preferred classroom design type; facilitation foci and facilitation methods.

Both models are inspired by a vision, which is confirmed with the completion of the context analysis, and then leading into the practice cycle. Similarly, the practice cycle of the Figure Eight model relates to the empirical research of evaluating the *Second Life™* learning experience stated in the customised model. In this study, the practice cycle commences with planning for the *Second Life™* learning experience, actioning it, observing the data and reflecting on the planning, action, and observation (equal to

the objectives, results, outcomes, and evaluation seen in the Figure Eight model). In this part of the research, Action Learning and Action Research are very prominent, because the researcher, facilitator and students learn through the actions that they perform. The students commence with an alternative learning experience, learning how to learn in *Second Life*<sup>TM</sup>. From this Action Learning, they can reflect and contribute to the vision of this study (and their own learning lives) on their learning experience in Africa within a *Second Life*<sup>TM</sup> higher education setting. The researcher learns while doing, observing, and reflecting.

The vision of Action Learning Action Research in this study relates to the vision of the Figure Eight model (creation of solutions), because it strives towards the improvement of a situation for, and with, the involved. Positive outcomes are sought by the active strive to address shared concerns, addressing ineffective practices (Zuber-Skerritt & Wood, 2019). The vision is transformative and emancipatory. The aim of how learning can be effectively facilitated in a *Second Life*<sup>TM</sup> classroom at an African University is linked to the vision of this study to reshape higher education learning facilitation in Africa through *Second Life*<sup>TM</sup>.

Figure 1.3 below represents the study plan and the processes followed in the execution of this study. It is a representation of the methodology followed to address the research questions in this study. The eclectic theoretical framework (see Chapter 2) seen to the left of this figure, filtered into the vision of the Action Learning Action Research-guided design and laid the foundation for the non-empirical research represented by the literature review (see Chapter 3). In such a way the *Second Life*<sup>TM</sup> landscape exploration started and gained further momentum with the empirical research in the subsequent content analysis (see Chapter 4) of key features in the documents on the web pages of higher education institutions that facilitate in *Second Life*<sup>TM</sup>.

Each of the 148 higher education institutions facilitating in *Second Life*<sup>TM</sup> globally in 2017 were visited individually. The categories of analysis were determined and rules for coding set before the web pages of the institutions were visited. The written text and images in the documents on the web pages of each university, which thus constituted a census, were coded according to set rules and the data were then

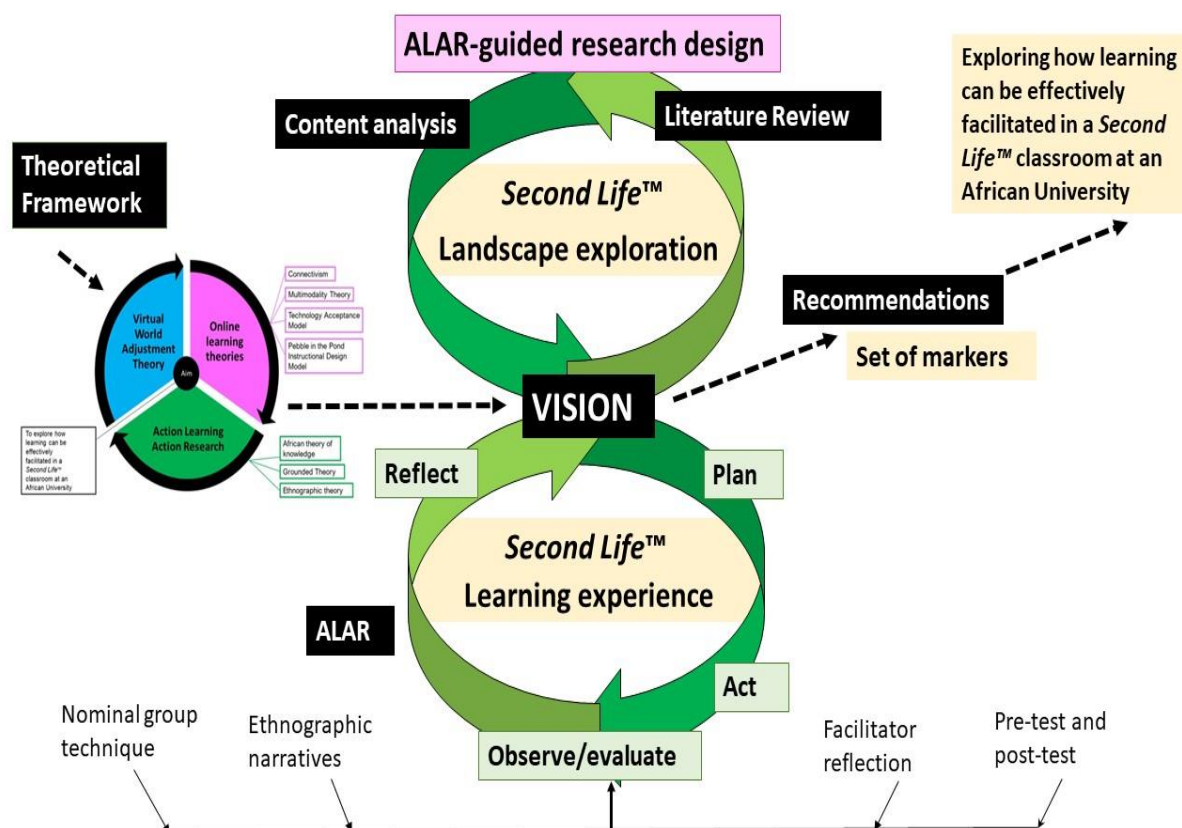


Figure 1.3: Study plan (Liebenberg, 2022)

analysed. The key features of the landscape (see section 1.4) were noted for each one of the 148 higher education institutions globally. Qualitative and quantitative data were derived from the content analysis. This empirical part of the research responds to the second research question: What are the key features of the landscape associated with learning facilitation in *Second Life™* classrooms at higher education institutions globally?

The analysed data from the content analysis confirmed the vision of the customised model (see Figure 1.2) and motivated the movement into the further empirical exploration (see Chapter 5) of the evaluation of the *Second Life™* learning experience. A sample of twenty-five (25) students and one (1) learning facilitator was selected by means of voluntary convenience sampling from a population of 1919 first year UFS students, enrolled for an additional English Academic Literacy module (EALH1508) in 2017. This population was obliged to register for EALH1508 based on poor performance on the National Benchmark Tests<sup>4</sup> (NBTs).

<sup>4</sup> Most of the universities in South Africa use National Benchmark Tests (NBT) to determine the proficiency of their first-year intake of students in terms of English Academic Literacy.

To evaluate the *Second Life*<sup>™</sup> learning experience the empirical research commenced with the *planning* for a *Second Life*<sup>™</sup> learning facilitation classroom at an African university. The planning included the choice of the higher education institution at which the empirical research would take place; the acquisition of land in *Second Life*<sup>™</sup> and assessing the compatibility of the ICT infrastructure with the ports needed to be open for *Second Life*<sup>™</sup> access (see section 5.4). During this phase qualitative data was gathered from the journal notes of the researcher.

The *creation* of this *Second Life*<sup>™</sup> learning facilitation classroom entailed ensuring access to the updated *Second Life*<sup>™</sup> viewer; registering the researcher as an avatar in *Second Life*<sup>™</sup>; creating a UFS learning facilitation space in *Second Life*<sup>™</sup>; designing the interior of the classrooms; identifying the module to be facilitated in *Second Life*<sup>™</sup> and recruiting the participants (see section 5.5). Qualitative data was gathered from the images taken and journal notes of the researcher.

During the *orientation* (see section 5.6), the researcher spent a full day in *Second Life*<sup>™</sup> to orientate herself in terms of the created learning facilitation space and the educational activities that had to take place there. Reflections on what she observed, her experiences and how it linked to the adapted Virtual World Adjustment Theory were noted (see section 5.6.1). Images were taken of the *Second Life*<sup>™</sup> UFS learning facilitation classrooms and meaningful images were included in section 5.6.1. Furthermore, three (3) exclusive orientation sessions in *Second Life*<sup>™</sup> followed, namely for ICT staff, the learning facilitator, and students. Qualitative data from observations during these orientation sessions and images taken were gathered in the journal notes made by the researcher. Thereafter three (3) learning facilitation sessions took place. One (1) class was in face-to-face format and the other two (2) in *Second Life*<sup>™</sup> at the created learning facilitation spaces of the UFS in this domain.

*During* the English Academic Literacy (EALH1508) learning facilitation sessions, for both face-to-face and *Second Life*<sup>™</sup> classes, students were given a test to complete before the learning facilitation commenced. These scores served as baseline from where the occurrence of learning could be measured. Thereafter, learning facilitation took place. The same test was given to the students after the learning facilitation sessions had taken place to see if their comprehension of the topic under discussion

bettered. This means that quantitative data corresponding to the three learning facilitation sessions (namely three sets of pre-test scores and three sets of post-test scores) were obtained. These test scores were used as quantitative measure to signify the occurrence of learning (see section 5.8.1). Furthermore, *during* these facilitation sessions, the researcher took detailed notes of observations made about the behaviour of students. The observations were described and interpreted in section 5.8.1. These observations added qualitative data to the quantitative data of the test scores and triangulated the data received.

*After* the learning facilitation sessions, the learning experience was evaluated by means of a nominal group discussion with the students, as well as ethnographic narratives requested individually from each student and the facilitator to reflect on their learning experience in *Second Life*<sup>TM</sup>. The qualitative data from these reflections are discussed in section 5.9.1.

The part of the study with its multi-method strategy (Zuber-Skerrit, et al., 2015; Zuber-Skerritt & Wood, 2019) responded to the third research question that states: What is the learning experience of students in a *Second Life*<sup>TM</sup> classroom at an African University? The reflection by the researcher hereafter led to the Grounded Theory of setting markers to guide effective learning facilitation at a *Second Life*<sup>TM</sup> classroom at an African University. This is regarded as a contribution towards the vision of the study.

Full detail of the variety of methodologies used in this study, namely the content analysis (see Chapter 4) and the evaluation of the learning experience (see Chapter 5) is provided in the respective chapters. The detail includes sampling, types of data, the data collection procedures, data analysis, ethical considerations, and the relevant quality assurance measures. It is also throughout indicated what the role of the theoretical framework was in informing the various processes, leading to the setting of markers.

## **1.9 Ethical considerations**

The Ethics Committee of the Faculty of Education at the UFS granted ethical clearance for this research, which is available in Appendix A. The study was conducted in line

with the ethical requirements of the UFS. The checklist of Patton (2003) on ethical issues was used in this study. The participants, namely the learning facilitator and the students were briefed by the researcher on the general nature of the study during the orientation session. A hard copy letter with this information was handed out to each one of them. Appendix B contains the hard copy information letter and consent form for the facilitator and Appendix C includes the hard copy information letter and consent form for the students. The confidentiality, with which participant students' responses and test scores would be handled, was emphasised. It was emphasised that participation in the study was voluntary and that refusal to participate would not result in any penalty. The right to withdraw from the study at any time was explained to them. Contact particulars to reach the researcher any time during the research process was also provided. Students that were willing to participate, and the facilitator, signed an informed consent form per individual. This was submitted to the researcher who kept it in a safe.

The complexity of existence in the reality and virtual reality simultaneously was highlighted to make the participants aware of the dualistic and complicated situation in which they were to embed themselves (Kuznetcova, Teeple & Glassman, 2018). The dialectic nature of avatars and how it may affect identity development was briefly explained to the participants to raise their awareness. Axiological considerations, which included grieving, harassment, avatars with hidden agendas, potential dangers and explicit content that may be encountered in *Second Life*<sup>TM</sup> were flagged by the researcher by means of a detailed explanation given to the participants in this regard. The researcher explained in person during the orientation session what steps to follow if confronted by grieving, harassment, avatars with hidden agendas or explicit content. A step-by-step guide with these explained steps, developed by the researcher, was handed to the students in hard copy and distributed via email to them. View this step-by-step guide in Appendix D. Praxiological factors were considered in this study. Participants were university students who were registered at the University of the Free State with the purpose to learn to eventually obtain a degree. But for them, to learn in a UFS *Second Life*<sup>TM</sup> classroom was new, atypical, and unfamiliar. This could gravitate the participants to explore the world of *Second Life*<sup>TM</sup> and deflect their attention from learning.

Preventative measures were implemented to counteract any form of bias in the study. During the process of data analysis, unfavourable data were not discarded and no modification of the interpretation of results was allowed (Rabinowiz, 2020). The researcher did not interfere with the data when it was collected. No manipulation of data took place. All the information and data that were collected, were kept in a safe and will be stored for two (2) years after the submission of the thesis. Any data will be presented in an anonymous way and no personal attributes will be made available. This study also placed scientific objectivity above personal advantage and recognised the obligation towards society to advance knowledge (Babbie & Mouton, 2001).

### **1.10 Quality assurance of the study**

The quality assurance of the study was affirmed by the applicable measures pertaining to the type of data. Quantitative data was tested for internal and external validity, while qualitative data was evaluated in terms of credibility and trustworthiness. The quality assurance measures for quantitative and qualitative data were strengthened by the gathering of data from the same group of participants. This was done to eliminate unequal sample sizes in the context of triangulated data and interpretations based on the combined data (Creswell & Creswell, 2018).

The external validity of the empirical research in Chapter 4, focusing on the landscape and key features of higher education institutions active in *Second Life*<sup>™</sup>, is strong since a census was used. Transferability is also strong, and generalisation is possible without statistical error (McMillan & Schumacher, 2006) because of the census.

Validity in Action Learning Action Research in Chapter 5 is more personal and interpersonal than methodological. Validity is based on interactive dialectic logic rather than reasoning on the dichotomy of truth as subjective or objective (Zuber-Skerritt & Wood, 2019). Multiple data sets used in ALAR bring perspective, which functions beyond the debate of the dichotomy of truth. The researcher in this regard rather focuses on perspective than the truth. In ALAR, rigour is obtained by triangulation and the use of multi-method strategies, which is also the case in this study. Perspectives and participant validation then ensure rigour. The dependability of the data in the nominal group discussion was confirmed because the questions in the nominal group

discussion were derived from the literature review and content analysis. Furthermore, dependability rested on the qualitative data that enhanced the quantitative data, which brought a holistic picture in response to the research questions of the study. The questions in the pre- and post-tests to students were based on the module content of the students and at least two questions were used to measure a construct (Flake, Davidson, Wong & Pek, 2022 ). Reflexivity was ensured to prevent any bias from the side of the researcher. This was done ensured by an audio recording of the nominal group discussion. What the participants said could be confirmed against the recording to ensure that the notes made were exactly what the participants said.

## 1.11 Significance of the research

An increasing demand for research on quality assured learning facilitation practices and learning in three-dimensional virtual worlds, especially *Second Life*<sup>™</sup>, was voiced by Gregory, Lee, Dalgarno and Tynan (2016). The urgency to understand what works, and what does not, regarding learning in *Second Life*<sup>™</sup> was also emphasised by Savin-Baden (2010). Hence, pedagogical models and valid learning theories for *Second Life*<sup>™</sup> learning are needed. This study addressed this observed research gap. The data findings from this study could be used to inform learning and learning facilitation practices in *Second Life*<sup>™</sup> in higher education institutions in Africa. Because literature often only describes the nature of virtual worlds and *Second Life*<sup>™</sup>, the contribution of this study was vested in the evidence of outcomes, based on higher education learning facilitation in a *Second Life*<sup>™</sup> classroom hosted in Africa. Another contribution of this study is the knowledge that it added in the higher education sector in Africa with the exploration if higher education learning facilitation in Africa can realise by means of *Second Life*<sup>™</sup>.

This study evaluated a current virtual world learning theory, namely the Virtual World Adjustment Theory of Fizzsimons (2012), and contributed to the adaptation thereof. This adaptation added to the development of learning theories in *Second Life*<sup>™</sup>. The adapted Virtual World Adjustment Theory links to the first research question of this study: What are the constituents of an appropriate theoretical framework for the facilitation of learning in *Second Life*<sup>™</sup> at an African University? (see section 1.2.2). The adapted Virtual World Adjustment theory is also applied in a non-western context

for the first time and appraised from an African perspective, linking it to the African Theory of Knowledge.

The further beneficence of the study in terms of research methodology was the realisation of a higher education classroom in *Second Life*<sup>™</sup> in Africa in which learning could be evaluated. Sporadic investigative studies in *Second Life*<sup>™</sup> in higher education institutions in Africa thus far touched mainly on the setting up and creation of these classes in *Second Life*<sup>™</sup>. But these studies did not focus on the learning experience in this domain. This study contributed to a set of markers to effectively facilitate learning in a *Second Life*<sup>™</sup> classroom at an African University.

The vision and findings of this study serve as a starting point for a viability study regarding the piloting and implementation of alternative learning facilitation, specifically through *Second Life*<sup>™</sup>, at the University of the Free State and universities similar to this university in Africa. If the viability study confirms the results of this exploratory study, the UFS could be the first university in Africa to establish an institutional and dedicated academic presence in *Second Life*<sup>™</sup>. The operationalisation of such a possibility could expand the academic project with added income possibilities from tuition fee income, government subsidies, and growth in research funding. If the results of this study do not support a viability study and find the execution of this proposal as fruitless in terms of money, time, and resources, then this study would still have served its purpose. The value of the exploration was then vested in the indication that this alternative way of learning in higher education in Africa, is not of significance. A further contribution is the opportunity for access equality, mediated presence, and intercultural competency in higher education in Africa.

This study also took into consideration the institutional context, as well as the context of the country in which it is positioned. Moreover, this study was in line with the UFS Strategic Plan for 2018-2022. Strategic Goal 2 guides the UFS to “renew and transform the curriculum” (University of the Free State, 2018:7), with section 2.3 stating to: “transform the pedagogical relationship between students and lecturers” (University of the Free State, 2018:7). Strategic Goal 3 requires the UFS to increase its “contribution to local, regional and global knowledge” (University of the Free State,

2018:7), with section 3.1 stipulating to “focus resource allocation for research and innovation on UFS areas of strength and distinctiveness” (University of the Free State, 2018:8). This study is further linked to the National Skills Development Strategy III of South Africa wherein Strategic Goal 2, section 2.4 urges that “relevant research and development and innovation capacity is developed, and innovative research projects established” (Tshilongamulenzhe, Coetzee & Masenga, 2013:5).

## **1.12 Layout of chapters**

An outline of each of the six chapters in this thesis is given below.

### **1.12.1 Chapter 1: Orientation to the study**

This chapter presents an introduction and short background to the research. Based on the identified research problem, four (4) research questions, the aim of the research and four (4) research objectives are introduced. The theoretical framework follows, and then a clarification of terms often used in this study. The research assumptions and demarcation of the study are described and then the research design and methodology are subsequently introduced. Ethical considerations are mentioned, as well as quality assurance of this study. The significance of the study and the layout of the chapters conclude this chapter.

### **1.12.2 Chapter 2: Theoretical Framework**

The second chapter commences with an explanation of the eclectic theoretical framework used in this study, highlighting Action Learning Action Research, the Virtual World Adjustment Theory, and online theories of relevance. Action Learning Action Research, linked to the African Theory of Knowledge, Grounded Theory and the Ethnographical Theory is discussed thereafter. Relevant concepts from online learning theories, namely the Pebble-in-the-Pond Instructional Design Model, the Multimodality Theory, Connectivism, and the Technology Acceptance Model were then pointed out. Thereafter, the Virtual World Adjustment Theory is explained in terms of its Orientation-, Euphoria-, Crisis- and Survival phases, which lead to Transformative Learning. Concepts of online learning theories were integrated into the Virtual World Adjustment Theory to propose an adapted Virtual World Adjustment Theory.

### **1.12.3 Chapter 3: Virtual Worlds and *Second Life*<sup>TM</sup> in higher education**

This chapter starts with a discussion on technology-driven changes in higher education and debates this situation especially in Africa. Thereafter the evolution of the World Wide Web (WWW), and its offerings for higher education learning facilitation is explained. This is followed by deconstructing virtual worlds, probing into the advantages and disadvantages of higher education learning facilitation in virtual worlds. This chapter concludes with a scrutiny of *Second Life*<sup>TM</sup>, viewing its benefits and limitations for learning facilitation in higher education. The considerations to set up a higher education classroom in *Second Life*<sup>TM</sup> ends off the chapter.

### **1.12.4 Chapter 4: Exploration of the higher education learning facilitation landscape in *Second Life*<sup>TM</sup>**

The research design and methodology are discussed first, including a description of the population, sample selection, data collection methods and data analysis. Thereafter, based on content analysis, the distribution of higher education institutions globally with an active learning facilitation presence in *Second Life*<sup>TM</sup> is discussed, followed by their nature of independence (public or private universities) and student enrolment numbers (size). Classroom design, subject fields of learning facilitation and methods of facilitation are deliberated upon next. The chapter concludes with ethical considerations and quality assurance for this part of the empirical research of the study.

### **1.12.5 Chapter 5: Creating and exploring the learning facilitation experience in a *Second Life*<sup>TM</sup> classroom**

Chapter 5 starts in a similar fashion to the preceding chapter, with research design and methodology discussed first, including a description of the population, sample selection, data collection methods and data analysis. Thereafter, based on Action Learning Action Research, a discussion follows on the planning before the creation of a small-scale *Second Life*<sup>TM</sup> learning facilitation project, the creation of a *Second Life*<sup>TM</sup> classroom and the orientation of the facilitator, ICT and students before the learning facilitation happened. Demographical data of the students are presented thereafter. Quantitative and qualitative evaluations follow to subsequently express the

student learning experience. Ethical considerations and quality assurance concludes this chapter.

### **1.12.6 Chapter 6: Reflection, Recommendations and Conclusion**

This chapter begins with a narrative reflection and a personal report of the researcher, reflecting on the eclectic theoretical framework and the literature review as the non-empirical research of the study. Thereafter, the empirical research on the landscape is reflected upon, followed by a reflection on the learning experience of students from Africa in a *Second Life*<sup>™</sup> classroom. The chapter concludes with limitations of the study, recommendations made and the contribution of this study.

# CHAPTER 2

## THEORETICAL FRAMEWORK

### 2.1 Introduction

A theoretical framework indicates the theory that a research study uses as structure to comprehend, critique, and reshape the phenomena being researched (Nagar, 2021). By virtue of a theoretical framework, the researcher is connected to knowledge that exists; is provided a basis from where the choice of research methods can be made; and is given the opportunity to critically evaluate theoretical assumptions (Chukwuere, 2021).

An eclectic theoretical framework is followed in this study, drawing from multiple, but applicable, theories to gain insight regarding four research questions leading to the aim of this research; namely, to explore how learning can be effectively facilitated in a *Second Life*<sup>™</sup> classroom at an African University. An eclectic theoretical framework does not hold rigidly to a single paradigm or a specific set of assumptions. This type of theoretical framework is not committed to a single theoretical framework but draws from multiple theories to explain phenomena (Kulkova, 2019). The advantage of an eclectic theoretical framework is that it assists to clarify a complex phenomenon as holistically as possible, because often certain theories alone cannot elucidate a complex process in its entirety (Fujii, 2018). Since theories on virtual learning, and especially *Second Life*<sup>™</sup> learning, are scarce, an eclectic theoretical framework is deemed applicable to optimally explore how learning can be effectively facilitated in a *Second Life*<sup>™</sup> classroom at an African University. Several theoretical frameworks were considered at the outset of the study, but after the applicability of the theoretical frameworks was assessed (see section 1.7), the decision was made to position this study within an eclectic theoretical framework. Figure 2.1 represents the eclectic theoretical framework seen as foundational to the reasoning in this study.

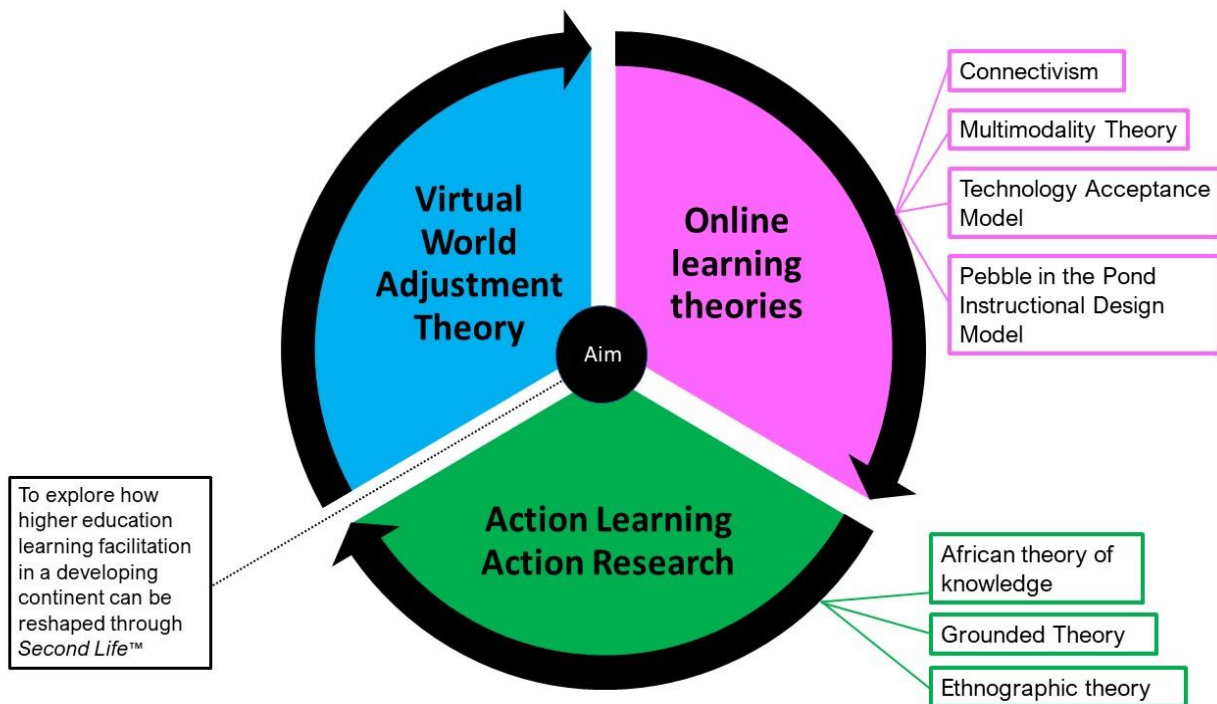


Figure 2.1: Eclectic Theoretical Framework (Liebenberg, 2022)

Three main groups of learning theories are represented in the eclectic theoretical framework, namely Action Learning Action Research (Zuber-Skerritt, 2011; Zuber-Skerritt, 2016), the Virtual World Adjustment Theory (Fizsimons, 2012) and some online learning theories. The Virtual World Adjustment theory is explained extensively in this chapter because it was one of only a few learning theories, focusing exclusively on virtual world learning, that could be located by the researcher. The Activity Theory (Engestrom, 2001) is also acknowledged as a virtual world learning theory, but the Virtual World Adjustment theory is deemed more applicable and flexible than the six concepts associated with the Activity theory, namely subjects; objects; tools; rules; the community and the division of activities; and was therefore chosen.

Learning theories focusing exclusively on *Second Life*<sup>™</sup> learning could not be found (Bodily, et al., 2019). This finding corresponds with the findings of Loke (2015) who states that there is a general under-theorisation of research in *Second Life*<sup>™</sup> (Savin-Baden, Gourlay, Tombs, Steils, Tombs & Mawer, 2010) and that researchers have not argued sufficiently on how the experiences of students bring about learning of real-world knowledge in *Second Life*<sup>™</sup>. Studies in this domain are often intuitive and focus on practical issues rather than having a theoretical focus and theory-based design on how learning happens. A definite gap appeared in this regard. More specific learning

theories are needed to help facilitators understand what exactly students can learn because of *Second Life*<sup>TM</sup> learning facilitation.

Concepts of online learning theories relating to learning in *Second Life*<sup>TM</sup> are included in the eclectic theoretical framework based on their contribution to comprehend the learning experience in this domain. In the further discussions of the three groups of learning theories hereafter, the value of each theory in the study will become clear. Thereafter, and at the end of the chapter, an adaption of the Virtual World Adjustment theory is proposed based on the integration of relevant and key concepts to the Virtual World Adjustment Theory. This chapter is a realisation of the first research question; namely: What are the constituents of an appropriate theoretical framework for the facilitation of learning in *Second Life*<sup>TM</sup> at an African University?

## 2.2. Action Learning Action Research

This section commences with an overview of Action Research, moving towards Action Learning Action Research (Zuber-Skerritt, 2016). Action Research serves as philosophy, learning theory, methodology, facilitation process, as well as a system of learning, development, and transformation (Zuber-Skerritt, 2011). The two main aims of Action Research are stated by Zuber-Skerritt and Wood (2019) as (i) to better practice and to contribute to practical and conceptual knowledge by improving the understanding of a certain context and its complexity, as well as (ii) positively change the environment, conditions, or context in which these practices take place, if the change is warranted. The motivation for these aims is to develop and improve an existing context or conditions.

Action Research is practical, participative, collaborative, interpretive, critical, and emancipatory. It is perceived as *emancipatory*, since it frees research from hierarchies and provides roles to the participants. The insights gained from Action Research happen while the research is ongoing and practical improvements are seen during and after the research (Huang, Wu, Hsin, Yip & Chou, 2022). The result of Action Research is thus not merely theoretical. Action Research is not seen as working with participants from an outside perspective or from a point of external authority, but the

researcher is rather doing research with, and for, the involved to better a condition or context.

Action Research is considered *interpretive* because this type of research is not seeking correct and incorrect answers to questions, but rather views and values the interpretation of the involved participants. Solutions are based on the perceptions and insights of those involved in a study. Therefore, research validity in Action Research is achieved by triangulation, participant confirmation and member checks (Wood & Zuber-Skerritt, 2013). Action Research is also *critical*, because it views a current context or conditions from a critical stance, through critical evaluation and self-critical overcoming of constraints, to ensure positive transformation and advancement. Action Research aims to positively change a present situation by means of consecutive transformative cycles building on one another. Each cycle encompasses four major phases, namely to i) plan, ii) act, iii) observe and gather data and iv) reflect on data; action; and research. In this study, Action Research envisages positive change and therefore aims to explore how learning can be effectively facilitated in a *Second Life*<sup>TM</sup> classroom at an African University.

Action Learning Action Research (ALAR), a specific form of Action Research, was followed in this study (Lewin, 1951; Zuber-Skerritt & Wood, 2019). ALAR stems from its two constituents, namely Action Learning and Action Research. Action Learning implies learning that occurs because of a concrete experience or action, but it also means the action taken because of the learning that happened. Action Research means a process of action, and reflection on and within, the action. This process of Action Learning and Action Research is cyclical and iterative, aiming at problem solving, systematic inquiry and active learning. The ALAR research journey is fluid and highly adaptable. ALAR usually resides within the social sciences and focus on humans, groups of people, and societies; acknowledging that their behaviour is not predictable, but complex and diverse.

Action Learning Action Research contrasts the traditional perception of learning, namely that knowledge must be obtained in terms of research findings, theories, or information before it can be applied. Rather than being taught by experts or specialists, ALAR postulates that knowledge can be sought or generated by means of

problem-solving processes. ALAR is a way of being, thinking, living, and feeling, which is determined by the paradigms of learning, facilitation and research, values, and worldviews (Zuber-Skerritt, 2011). It is also the belief of Action Learning Action Research that theory informs practice, and practice influences theory. Theory and practice become integrated, leading to collaborative progress. Practice, research, and development are not split, but rather assimilated. Theory and practice then become praxis, whereby the act of engagement and doing develop. ALAR leads to the empowerment of participants based upon their experience and practice of solving problems in new situations. Problems are solved based on personal experience, with participants seen as equal contributors within groups (Zuber-Skerritt, 2011).

Action Learning Action Research is relevant in this study with the creation of a small-scale project of higher education learning facilitation at an African university to explore the learning experience in *Second Life*<sup>TM</sup>. The phases of an Action Research cycle are visible and clear in this study. During the planning phase, the creation of a small-scale project for higher education learning facilitation in *Second Life*<sup>TM</sup> in Africa was planned and prepared. Amid the action phase, this small-scale project was created, and participants orientated. The evaluation phase of the learning experience was concurrent with, and after, the learning facilitation. The reflection phase followed whereby the value of the learning experience was contemplated. This ALAR process links with the third research objective of this study; namely, to explore the students' learning experience at an African university through the creation of a small-scale project of learning facilitation in *Second Life*<sup>TM</sup>.

Zuber-Skerritt (2011) mentions relevant theories for utility with Action Research, for example Critical Theory, Grounded Theory, Action Theory, Experiential Learning Theory (Boshoff & Fernandes, 2020), Personal Construct Theory and Systems Theory. The ALAR process in this study also uses Ethnographic Theory (Boshoff & Fernandes, 2020; Malinowski, 1944) to explore the learning experience of the students in the *Second Life*<sup>TM</sup> learning facilitation sessions and Grounded Theory (Brown, 2019) as the resultant of the Action Research cycle, leading to markers that were developed. Because of the focus on a developing continent, concepts rooted in the African Theory of Knowledge (Aja, 2015; Quampah, et al., 2016) are also embedded in the Action Learning Action Research-guided design of this study. A brief overview of the three

embedded theories, of which key elements were built into the theoretical framework, is given below.

### **2.2.1 Grounded Theory**

Grounded Theory explores how humans interact - especially when using symbols, such as language, to create new knowledge about these phenomena (Brown, 2019). This theory explores cultural phenomena in a systematic and inductive way, because the reality of research participants is verified and socially shared meanings that influence behaviour are observed in a structured way. Grounded Theory identifies emerging patterns and new theory is conceptualised from the identified patterns. Theory is produced based on the systematic collection of data from multiple sources, happening simultaneous to the analysis thereof (Noble & Mitchell, 2016). With these social processes that are followed, collective patterns as well as relationships and behaviour within groups are often uncovered.

Grounded Theory is fluid and flexible and adapts as the learning process continues, leading to the generation of new theories or the modification of existing ones. Interpretation and conclusions emanating from Grounded Theory is reliable because it is based on multivariate data gathered from processes that happen sequentially, subsequently, simultaneously, serendipitously and scheduled. Grounded Theory does not lead to the reporting of facts, but rather probability statements about the relationship between concepts.

Grounded Theory is deemed applicable in this study, because the response to the fourth research objective, namely the compilation of a set of markers to guide effective learning facilitation in a *Second Life*<sup>™</sup> classroom at an African University, is strongly associated with this theory. Therefore, Grounded Theory forms part of the theoretical framework of this study.

### **2.2.2 Ethnographic Theory**

Modern Ethnographic Theory (Giuseppe, 2020; Malinowski, 1944) states that authors are not subject to someone else's ethnographic data but use their own data to build complex narrative plots. Although Ethnographic Theory values the relationships

between readers, writers and subject matter, the impact of writers on readers is given preference (Nader, 2011). Pursuant to Ethnographic Theory, the researcher becomes immersed in the lives of participants and observes them. The role of the researcher is to describe and interpret the observed patterns by means of the method of ethnography. The data gathered by the researcher from participation, observation, explanation, and description is unstructured and must be interpreted to comprehend the beliefs, social interactions, and behaviour of small groups (Jyoti, 2020). Ethnography aspires to investigate and comprehend specific phenomena, but also believes there is no absolute truth with interpretation. Ethnography does carry a risk for bias, is costly and has a long duration, but its value lies in the plausibility to explain collected data, such as from field notes, journals, narratives, audio visual material and cultural artefacts.

Ethnography provides a platform to regard participants in their context, viewing them in their cultural setting and a narrative account of the specific culture is usually produced (Naidoo, 2012). In this study, ethnography ensured that the narrative from the participants from Africa, on the learning experienced, were expressed. Ethnography also contextualised the diverse cultures, needs and backgrounds in this developing continent and mirrored it against *Second Life*<sup>TM</sup> culture. Moreover, the researcher is part of the learning facilitation sessions and most importantly, she reflects by means of auto ethnography upon her own personal experience regarding the learning events. Ethnographical narratives were also requested from the students after the learning facilitation sessions to obtain their views on the learning experience.

### **2.2.3 African Theory of Knowledge**

The African Theory of Knowledge postulates that knowledge is acquired in terms of subjects; objects to be known; and how the objects can be known (Aja, 2015). To verify if knowledge has been acquired by someone, three determinants are used, namely the one who knows (subject); something that is to be known (object); and the way of coming to know something. What is therefore very important about knowledge and learning, is the relationship that informs knowing the object. Knowledge and learning imply bringing the object to light. Knowledge is based on how the object was made clear to the one who now knows; namely, by perception, comparison, or

testimony (Quampah, et al., 2016). *Knowledge from perception* evolves from the senses of the subject based on the contact that the subject makes with the actual object. *Knowledge from comparison* means that knowledge only emerges when an object that is not known is compared to an object which is known already. *Testimony* means knowledge achieved because of something told by a dependable source. True testimonial knowledge must meet three criteria; namely, the persons that present the testimony must be honest and reliable; the speakers must truly know their case; and the receivers must understand precisely what they are hearing (Aja, 2015).

True knowledge in Africa must be an existential truth which is lived and experienced and does not emanate from premises or assumptions (Iwang, 2016). Before truth can become known about another person's experience, the subject must have experienced a similar condition. Reality in the African world is a personal experience. Therefore, the African world is personal, unitary, created from human experience and lived in the African culture. Traditionally, Africans place community and ancestry at the centre of existence as well as knowing (Nkulu-N'Sengha, 2005) and perceive community as a crucial foundation for science in Africa. Furthermore, all in the entirety is connected to all in the entirety. The universe, nature, spirits and humans are all considered one, and as a commune (Quampah, et al., 2016) which constitutes the basis of knowledge, development and existence (Ikuli & Peter, 2020).

The African Theory of Knowledge relates to learning facilitation in *Second Life*<sup>™</sup> by considering the forces within the virtual universe and how the avatars behave within this universe. Cohesion and interaction, which are very important in learning facilitation in *Second Life*<sup>™</sup>, are key in the African Theory of Knowledge. The premise that this theory places on interaction between people, and between people and the non-human, to create knowledge, resonates with virtual learning. It is imperative that interaction takes place between avatars, and between avatars and artefacts, for learning to happen in *Second Life*<sup>™</sup>. The connectedness of everything with everything in the African Theory of Knowledge relates to Connectivism (see section 2.3.1).

## 2.3 Online learning theories

Key elements of current online learning theories, namely Connectivism (Siemens, 2005), the Multimodality Theory (Bernsen, 2008), the Technology Acceptance Model (Davis, 1989), and the Pebble-in-the-Pond Instructional Design Model (Merrill, 2002), are explained in this section. These key elements relate to learning in virtual worlds and are integrated with the Virtual World Adjustment Theory in section 2.4 to create an adapted Virtual World Adjustment Theory.

### 2.3.1 Connectivism

Connectivism (Siemens, 2005) is an online learning theory, stating that learning results from the online connections amongst humans, or between humans and inanimate objects. The close link with the African Theory of Knowledge (see section 2.2.3) is clear. Learning is the consequence of the networked diversity of human opinions. Downes (2007:1) states: “Knowledge is distributed across a network of connections, and therefore learning consists of the ability to construct and traverse those networks”. When connections between information sources are identified and maintained, continual learning is sustained. Connectivism claims that to understand *where* to find knowledge outweighs *what* that knowledge encompasses (Siemens, 2006). Furthermore, the knowledge external to humans and non-humans is perceived as more important than a person’s existing state of knowing.

All the available information in modern times makes it impossible for students to know everything needed for assessment of specific situations. According to Connectivism, students are perceived as having knowledge based on systems of networks. By being networked, students can tap into huge databases of knowledge. These networks guide students to find information and build on accumulated networked knowledge. Connectivism thus explains learning in *Second Life*<sup>™</sup>, because of the divergent opinions from the global student catchment area present during learning facilitation sessions. The linking of varieties of opinions leads to knowing. Learning in *Second Life*<sup>™</sup> occurs because of the connections, discussions, debates and engagement amongst avatars, the *Second Life*<sup>™</sup> environment and artefacts.

One of the advantages of deconstructing learning according to the principles of Connectivism is that learners stay current in terms of their knowledge because of their ongoing connections. Siemens (2006) explains that knowledge stays relevant, because it is embedded in networks and ecologies, and not in hierarchies or categories. By means of networking, individuals thus continuously learn. Nevertheless, questions do arise if students are adequately self-directed, self-motivated, and fluent to work in social networks to flourish and develop conceptual knowledge independently in connected learning environments (Soroya, Ahmad, Ahmad & Soroya, 2021). Learning is claimed to vest in non-human equipment, but this is questioned because it is not clear how this acquired knowledge in non-human apparatus can be accessed. Siemens (2019) cautions that networks and connections occur within systems, with often set rules for connection. Therefore, networks do not necessarily enable individual agency. Also, knowledge is not derived only from systems. Moreover, Zeng, Chen and Burgos (2018) argue that Connectivism does not elucidate how the information in the connected nodes is incorporated into networked systems after learning occurred (Downes, 2022).

### **2.3.2 Multimodality Theory**

The Multimodality Theory (Bernsen, 2008) acknowledges that people communicate in a variety of ways. In an online environment, it is said that all the modes used to communicate (speak, write, posture, font choice, colour, images, video, gesture, and gaze) must be recognised by receivers to understand the messages of other people and this usually supports them in learning. When learning with technology takes place, learning will be improved if as many as possible of the human senses and modes of communication are involved (Bernsen, 2008). Therefore, a system of multimodality is proposed by this theory for learning to occur.

Multimodality is a system of i) human-computer interactions, ii) human senses, iii) physical media, iv) modalities and v) information channels (Bernsen, 2008). i) *Human-computer interaction* is a physical process of humans exchanging information with computer systems. ii) There are six *human senses*: namely, sight; touch; smell; hearing; taste; and proprioception. For information to be perceptibly communicated to other humans, which is needed for learning, these interactions need to be initiated by

iii) *physical media* towards one or more of the six senses of other humans. iv) Single or different *modalities* can be used within the same physical medium to relay information; for example, a photo-realistic image and a linguistic text description can be selected to express what a particular person looks like and sent by the physical media of graphics (Bernsen, 2008). v) Abstract information must be transformed by *information channels* into physical representations (material properties of the chosen physical media) for learning to occur.

All the elements of learning, according to the Multimodality Theory, are incorporated in *Second Life*<sup>TM</sup> learning facilitation, namely human-computer interaction (*Second Life*<sup>TM</sup> and avatar interplay), modalities (sight of avatar students; voice of an avatar facilitator), media (images and audio), and information channels (size and forms of avatars). Communication modes, involving the human senses and technology, are also present. Mouth and lip movements of avatars during visual speech, for example, bring acoustic speech modalities to learning settings in *Second Life*<sup>TM</sup> (Bernsen, 2008). In *Second Life*<sup>TM</sup>, avatars are visible, can be heard and touched (although not felt directly).

However, the Multimodality Theory emphasises the static elements within the traditional online context, and not so much the fluidity of virtual learning environments, such as *Second Life*<sup>TM</sup>. Critique against the Multimodality Theory is that it oversimplifies learning facilitation to only the aggregate of modes of communication. Interaction between those modes also produces new knowledge, which is not emphasised by this theory. Seeking beyond the sum of communicative parts, is omitted to the detriment of a more complete understanding of learning. Caution is raised that the Multimodality Theory views learning facilitation as just computer-based communicative activity leading to learning, which diverges into determinism (Hippala, 2021).

### 2.3.3 Technology Acceptance Model

The Technology Acceptance Model (Davis, 1989) states that people will engage with technology if they perceive it as useful and easy to use. Perceived usefulness means that people are of the belief that technology will improve and simplify their lives (Mohr

& Kühl, 2021). Perceived ease of use implies the “degree to which a person believes that using a particular system would be free of effort” (Davis, 1989:320). It means that the new technology is perceived as user-friendly and effort expectancy is low. The theory also suggests that students will interact with technology if enjoyment is associated with the use thereof, and a pleasant perception accompanies the use of the new technology. These three factors, namely usefulness, ease of use and enjoyment significantly influence the attitude of students towards technology and their intention to use technology, as well as to continue to use it. Positive attitudes better the chances that technology will be accepted and that students will use the technology (Davis, 1989; Venkatesh & Davis, 2000).

With *Second Life*<sup>TM</sup> learning facilitation, ease of use, usefulness and enjoyment are paramount. To make it easy for students to learn in *Second Life*<sup>TM</sup> and to show them how useful learning facilitation in this domain can be, orientation sessions are deemed crucial when students enter learning facilitation in *Second Life*<sup>TM</sup>. The Millennial and Generation Z students, together with the upcoming Generation Alpha, perforate the boundaries between work and play and therefore the element of enjoyment in *Second Life*<sup>TM</sup> learning facilitation is very important.

### **2.3.4 Pebble-in-the-Pond Instructional Design Model**

The Pebble-in-the-Pond Instructional Design model (Merrill, 2002) focuses on online design and learning. The learning process is compared to a pond. The Pebble-in-the-Pond Instructional Design Model confronts the student with a problem or task to be completed at the outset, which is represented by the first pebble thrown into a metaphorical pond. A progression towards the completion of the whole task is implied. It means that problems, increasing in complexity, are gradually presented to students, as a second pebble. A staggered approach to learning and acquiring of knowledge forms the second pebble. Guidance is given and sub-problems added until the whole problem is solved successfully. The third pebble in the pond means that all the components and skills needed to finish each task in the progression of learning, are successfully identified. The fourth pebble means that an instructional strategy is determined for students to engage with the content, as required by the problem, to solve the problem. In such a way, the fifth pebble is thrown into the pond whereby the

knowledge and skills are obtained in a staggered way to solve the whole problem. Instructional strategy aims at an appropriate sequence to deal with knowledge components, learner guidance and coaching. If the sequenced sub-problems are solved successfully by students, the whole problem is solved, and this is considered as the acquiring of knowledge. The consequential effect of different ripples then leads to learning. The Pebble-in-the-Pond Instructional Design model is consistent with current pedagogical views that authentic experience in real-world problems leads to learning (Merrill, 2002).

The Pebble-in-the-Pond Instructional Design model relates to learning facilitation in *Second Life*<sup>™</sup>, because real-life problems are presented to the students inworld. They must solve the problem how to learn in a virtual world and acquire the specific knowledge in this world to obtain their degrees. They need to overcome the staggered sub-problems commencing during the orientation sessions until they can learn as avatars in *Second Life*<sup>™</sup>.

## 2.4 Virtual World Adjustment Theory

Fizsimons (2012) developed the Virtual World Adjustment Theory. This theory draws from the literature on cultural shock (Bochner, 2003; Pachecho, 2020) and cultural adjustment (Pekerti, Van de Vivjer, Moeller, Okimoto & Edwards, 2021) and is applied to the context of virtual world environments. Culture shock happens when a person moves from a familiar environment of easy and successful functioning to one that is not, and alien. This person consequently suffers from the loss of emotional equilibrium (Vicentiy, 2021). The physical relocation of students, for example, from one milieu to another, namely the change in geographical location, cultural environment, or language context, often leads to emotional distress and thus evokes culture shock (Al-Krenawi & Al-Krenawi, 2022; Fizsimons, 2012). Learning facilitators, also, might experience culture shock when they must relocate to educate students elsewhere, whether in real life or virtual (Pacheco, 2020; Wahyuningtyas, Sumbogo, Rusgowanto, Yunus, Willyarto & Cahyanto, 2021). Culture shock relates to travelling, as if to a foreign land, and refers to any situation where someone is obligated to adjust to an unfamiliar social setting where previous learning no longer is valid (Fizsimons, 2012). When entering *Second Life*<sup>™</sup> learning facilitation, culture shock is vivid since the ways

students learn are disrupted. This needs to be considered when learning facilitation is planned, prepared, and created for this domain. The common theories of culture shock and adjustment bring a powerful lens to deconstruct and debate learning facilitation in *Second Life*<sup>TM</sup> (Fizsimons, 2012).

The Virtual World Adjustment Theory consists of five sequential phases namely, orientation; euphoria; crisis; survival; and transformation. Each of these phases considers culture shock and adjustment while representing a movement towards new knowledge and understanding. Within each phase, key moments are present that enable learning.

### 2.4.1 Orientation phase

The initial phase of the Virtual World Adjustment Theory, namely the *orientation phase*, happens when students<sup>5</sup> first enter learning facilitation in virtual worlds; in this study, *Second Life*<sup>TM</sup>. During this phase, sojourners usually experience their existence as between societies, namely the culture of their origin in the real world and the newly acquired culture in *Second Life*<sup>TM</sup> (Pacheco, 2020). In the culture of their origin, there are timetables, real spaces, deadlines, and a sense of community with a collegiate culture in real life higher education institutions. A common cultural context prevails. When students enter in *Second Life*<sup>TM</sup>, culture shock is experienced because of the contrasting pluralistic and diverse virtual context. It diverges in several ways from their offline cultural context. Here, students also meet avatars that log in from all over the world and choose to integrate, or isolate, in *Second Life*<sup>TM</sup> (Chen, Hung & Yeh, 2021).

Geeraert, Li, Ward, Gelfand and Demes (2019) hypothesised regarding cultural distance, namely that the larger the cultural distance between original and host cultures, the higher the probability of more challenges for sojourners. This transition is stressful. Therefore, orientation sessions for learning facilitators and students are of utmost importance and deemed necessary by the Virtual World Adjustment Theory (Fizsimons, 2012). Orientation sessions help students to experience the movement to a new culture in a more positive light, to adjust to *Second Life*<sup>TM</sup> learning facilitation

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<sup>5</sup> Students in *Second Life*<sup>TM</sup> are often described as sojourners because they temporarily reside in *Second Life*<sup>TM</sup> and stay voluntarily in this space related to their specific goal in higher education. Throughout their studies, they constantly move between two cultures, namely the culture of their origin and their host *Second Life*<sup>TM</sup> culture.

and to learn in this domain. Learning in *Second Life*<sup>TM</sup> happens because of cultural adjustment based on i) the information students receive about the host culture, its economy, and topography; ii) the development of skills necessary to negotiate with the environment; iii) communication with peers, learning facilitators and other avatars, and iv) recognition of the known in the unknown (Fizsimons, 2012). During the orientation phase, students add and accept friend and group invites, employ their voice and text chat communication, master camera controls, learn to teleport, acquire flying skills, edit their avatar appearance, and make clothing choices (Fizsimons, 2012). Orientation survival skills, as pictured in Figure 2.2, are to learn to sit, walk, run, fly, and teleport between locations; add friends, accept friendships, and accept invites to groups; add landmarks, add favourites; use voice chat, text chat and instant messaging; take snapshots, use camera controls, and edit avatar appearance (*pimp my avatar*).

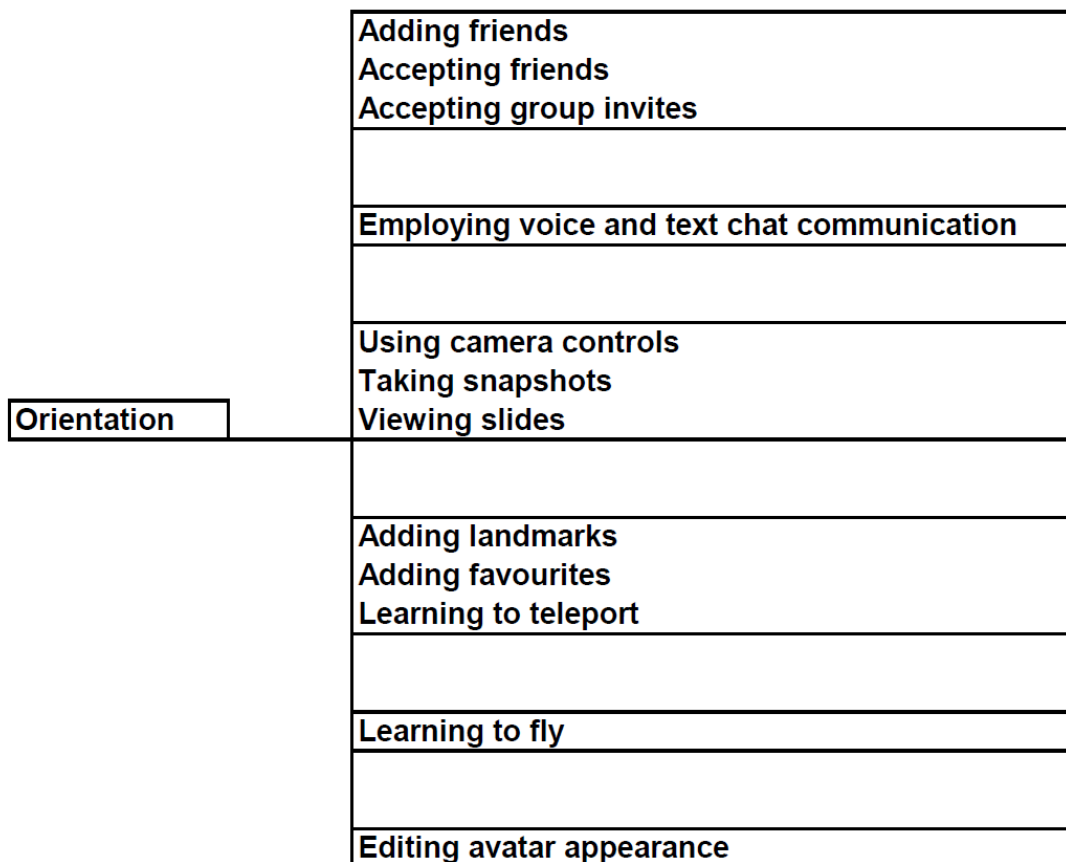


Figure 2.2: Orientation Phase of the Virtual World Adjustment Theory (Fizsimons, 2012:173)

It is recommended that opportunities be created during the orientation phase whereby students can discuss their experiences in *Second Life*<sup>TM</sup> with one another. The

importance of these discussions between students from different cultures is stressed. It is also advisable that the familiar is created within the unfamiliar for students to recognise, with the effect that the cultural shock is not too big. Therefore, a replication of the offline environment is often the case in *Second Life*<sup>TM</sup>, bringing assurance of the known inworld. The known in the unknown is critical in the orientation phase (Fizsimons, 2012). This motivated the researcher to create a setting similar to the real life UFS within *Second Life*<sup>TM</sup> with traditional classrooms; to attend to the cultural shock that is experienced when moving into the unknown (see section 5.5.6). When the student learning experience is explored within parameters that are unknown to African students, footprints of the known must be present.

### 2.4.2 Euphoria phase

The subsequent *euphoria phase* is filled with arrival fascination when students enter learning facilitation sessions in *Second Life*<sup>TM</sup>. In this phase, a euphoric atmosphere, enthusiasm, and affective language are usually observed, which positively contributes to the learning process of the students. With the onset of learning facilitation in this honeymoon-like phase, students are intrigued by *Second Life*<sup>TM</sup> and the pleasantness and amazement with *Second Life*<sup>TM</sup> are often expressed by students. The euphoria phase is displayed in Figure 2.3 whereby the euphoric expressions can be seen.

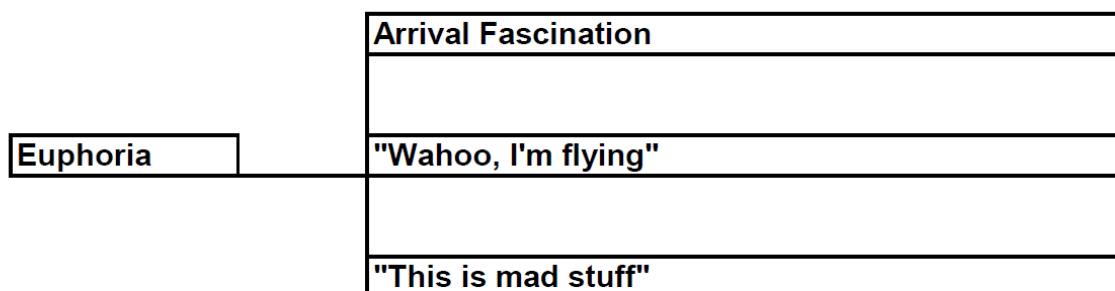


Figure 2.3: Euphoria Phase, Virtual World Adjustment Theory (Fizsimons, 2012:175)

As the learning facilitation sessions progress, the euphoria often gradually diminishes (Fizsimons, 2012). A shift in the perception of students is common as learning facilitation progresses. One student commented: "I am finding this process of learning to be very interesting, but I don't know if it will stay like this after the novelty wears off" (Fizsimons, 2012:176). Therefore, during and after the orientation of students, they

were given ample time to experience the euphoria before the learning facilitation started (see section 5.6.4). This assisted that students were less distracted and could focus on learning during the facilitation sessions in *Second Life*™.

### 2.4.3 Crisis phase

The *crisis phase* that follows, is characterised by minor crises as familiar symbols and signs, which students use to orientate themselves, are left behind (Fizsimons, 2012). The crises include i) *affective*, ii) *behavioural* and iii) *cognitive* challenges coming from stress, anxiety, depression, and helplessness. Feelings of isolation and alienation may increase in this phase as the motivation of students to adjust to the new host culture gradually decreases. This could be detrimental to the learning experience. Figure 2.4 shows the crisis phase with its challenges.

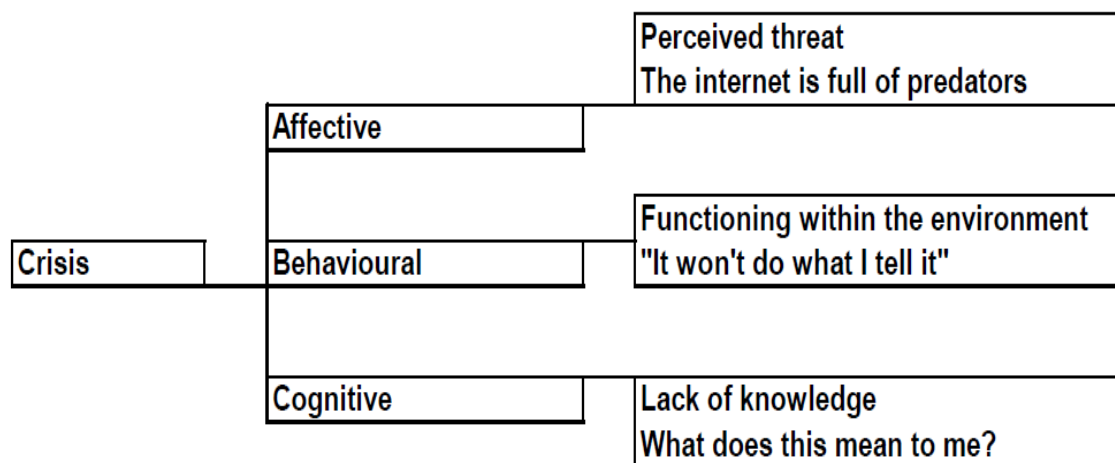


Figure 2.4: Crisis Phase, Virtual World Adjustment Theory (Fizsimons, 2012:176)

The affective, behavioural, and cognitive crises are explained in more detail below.

#### 2.4.3.1 Affective Crises

*Affective crises* occur if students become aware of symbolic threats in *Second Life*™, specifically when they feel that their standards, beliefs, values, and morals are threatened. Symbolic threats are often experienced during the transition of the known to the unknown. When symbolic threats are experienced in *Second Life*™ social anxiety ensues (Fizsimons, 2012). Affective crises also arise amongst students in

*Second Life*<sup>TM</sup> from the fear of online predators. Stereotypical online predators prowl on online sites visited by children and adolescents (Wendy & Patrick, 2020), but in *Second Life*<sup>TM</sup> predators also use publicly available information to target their victims. “Unfortunately, the internet is full of predators and *Second Life*<sup>TM</sup> is no exception to this” (Fizsimons, 2012:178). The fear of predators during learning facilitation in *Second Life*<sup>TM</sup> seems to be especially prevalent amongst digital natives. The reason is that this group in their daily lives decides carefully whom they invite, accept, and reject in their online worlds. By doing so, they surround themselves with others sharing their values, morals, standards, and beliefs. However, when they enter in *Second Life*<sup>TM</sup>, they are confronted by diversity and openness. This then challenges their feelings of security and explains their fear of predators in *Second Life*<sup>TM</sup>. A further affective crisis stems from concerns about security because it is not always easy in *Second Life*<sup>TM</sup> to confirm authentic identity. An avatar cannot always trust another avatar in a conversation if unsure about the real identity of the other. *Second Life*<sup>TM</sup> anonymity may act as a mechanism for malicious people to deceive others, but this is also true for other online environments (Fizsimons, 2012). Based on mentioned struggles and movement away from the understood, established norms and the rules of everyday life, affective crises then arise.

#### **2.4.3.2 Behavioural crises**

Common behavioural struggles which lead to *behavioural crises* include difficulties to navigate in *Second Life*<sup>TM</sup>, challenges to acquire *Second Life*<sup>TM</sup> skills, efforts to edit avatars, and locomotive problems. Students often then must work exceptionally hard to master relevant skills to be able to function in the new *Second Life*<sup>TM</sup> culture. They must also acquire socio-political and historical knowledge from their host *Second Life*<sup>TM</sup> higher education institution where they register as students. If avatars are confronted by struggles during learning facilitation sessions in *Second Life*<sup>TM</sup>, social incompetent behaviour might develop. Behavioural struggles then contribute to a sense of fear, which often decreases the impetus to adapt to a new culture. Often, students view their avatars as tools that enable them to behave in certain ways in *Second Life*<sup>TM</sup>, instead of an expression of the self. Behavioural struggles are then attributed by students to the avatar impersonations, as if the avatars have a will and decision-making power of its own. Furthermore, the development of behavioural skills

relevant to *Second Life*<sup>TM</sup> directly influences the quality of the learning experience of students during learning facilitation in *Second Life*<sup>TM</sup> (Fizsimons, 2012).

### 2.4.3.3 Cognitive crises

When various cultures meet, and established truths are questioned *cognitive crises* often occur. Cognitive struggles in virtual worlds happen mainly in two related areas, namely questioning the essence of the learning facilitator's role, and students that query their own beliefs and opinions. Students are accustomed to historical teaching practices, namely lecturing, with knowledge centred in the academic. However, *Second Life*<sup>TM</sup> places new demands on learning facilitation, especially by the mode of delivery - which is often novel to them. This provokes reflection and challenges students' cognitive beliefs, assumptions and understanding of learning facilitation. Cognitive struggles arise, because concepts such as identity, learning facilitation and the role of higher education institutions are consequently deeply questioned (Fizsimons, 2012). Within *Second Life*<sup>TM</sup>, students from all over the world are encountered. This leads to a high prevalence of divergent opinions, which is more so than in a real-world, face-to-face facilitation context. The firmly held beliefs, values and ideas of some avatars are often questioned and must be re-considered. This leads avatars to reflect on their own beliefs and opinions (Fizsimons, 2012).

### 2.4.4 Survival phase

In the *survival phase*, students try to overcome the struggles of the crises phase in *Second Life*<sup>TM</sup> by means of dynamic processes. The survival phase engages and capacitates students through a variety of adaptation techniques. Active engagement gradually lessens the crises challenges and leads to recovery from culture shock (Fizsimons, 2012). Figure 2.5 depicts the survival phase in terms of the Virtual World Adjustment Theory. When students are in the crisis stage, everything seems chaotic

and strange. However, during the stage of survival, there is a cumulative move among avatars to understand the richness of the experience of learning. The different challenges present in the crisis phase are conquered and survived by means of

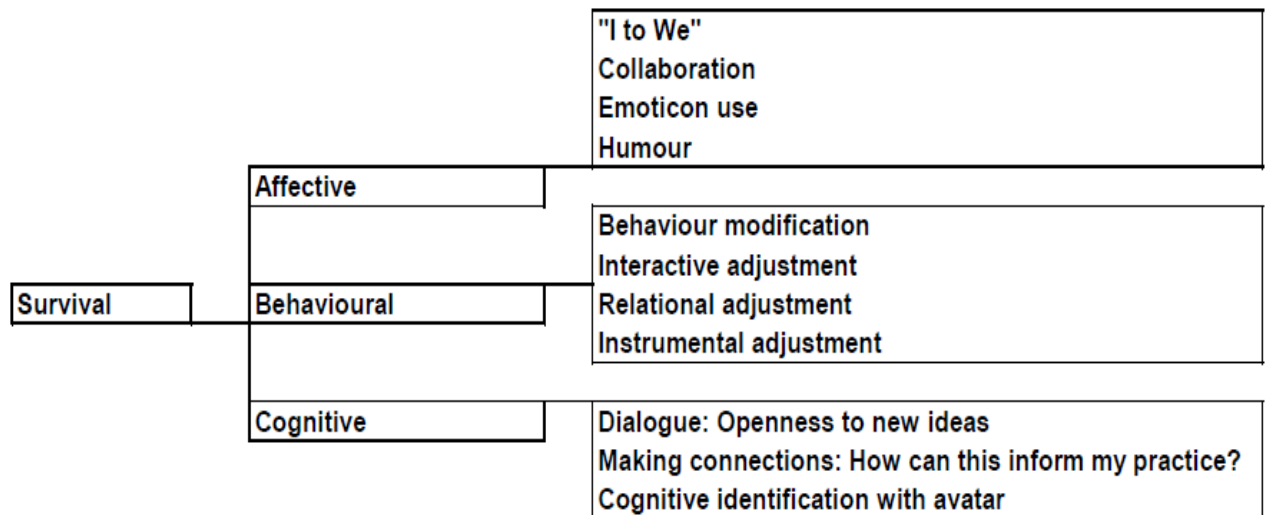


Figure 2.5: Survival phase of the Virtual World Adjustment Theory (Fizsimons, 2012:183)

knowledge acquisition and reflecting on what was learned. These all contribute towards the quality of learning and avatars are eventually transformed by the journey to overcome the challenges (Fizsimons, 2012).

#### 2.4.4.1 Affective survival

Furnham and Bochner (1986) indicate that friendship plays a crucial role and enhance the well-being when adapting to new environments. Friendship provides support and positive reinforcement amongst students. The same applies to virtual world adaptation during learning facilitation in *Second Life*<sup>TM</sup>. *Affective survival* in virtual worlds rests heavily on collaboration and friendship. This is visible in the emoticons and social cues that students use during learning facilitation in *Second Life*<sup>TM</sup> and which they display to overcome the absence of physical cues (Fizsimons, 2012). Social networks allow for discussions to take place, as well as social interaction, and reciprocal mutual support. In such a way, knowledge is created about the new culture into which avatars enter.

With affective survival, students often resort to self-initiated sharing on how to best overcome challenges, humour, and personal language transformation (from the single, *I* and *me*, to the plural, *we*, *our* and *us*). The increase in commonality in language evokes a shared experience. This movement in language represents the common bond, shared identity and group cohesion that form the basis to enable learning in *Second Life*<sup>TM</sup> learning facilitation sessions. Group cohesion becomes evident when avatars identify with other avatars as the comparable other.

Students usually compare themselves to their counterparts in terms of their *Second Life*<sup>TM</sup> lives and challenges, such as learning to fly as newbies, and how to navigate and teleport (Fizsimons, 2012). They network and ask for assistance of their peers when they must overcome challenges. Typical behaviour of students in *Second Life*<sup>TM</sup> is that they offer to help those who fall behind. As the avatars in front progress further in *Second Life*<sup>TM</sup>, they will forward links to those who are behind them to be able to catch up. When these students join them, they usually welcome them back with joy.

However, Fizsimons (2012) mentions that in a few instances, friendships and social networks might have adverse effects in *Second Life*<sup>TM</sup> if they, for example, oppose the integration with the host culture during learning facilitation sessions. The transition of students from a familiar environment to the unfamiliar *Second Life*<sup>TM</sup>, carries the potential to raise affective vulnerabilities in them, like low self-esteem, anxiety, and lack of motivation. These often are hurdles to potential learning. If a positive and inclusive environment is created by means of different learning facilitation methods, coupled with fun and humour, then affective obstacles are usually lessened<sup>6</sup>. (Fizsimons, 2012).

#### **2.4.4.2 Behavioural survival**

Cultural relevant skills are necessary for avatars to adapt effectively in terms of their behaviour in their new host culture, namely *Second Life*<sup>TM</sup> (Fizsimons, 2012). Three sub-categories of behavioural adaptation are critical in the new learning facilitation environment, namely instrumental, interactional, and relational adjustment.

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<sup>6</sup>*Second Life*<sup>TM</sup> learning does not happen because the facilitator is funny, but rather because students are having fun (Fizsimons, 2012). Humour usually leads to interaction and also creates mental pauses, with subsequent renewed focus on subject knowledge.

Instrumental adjustment means the ability to navigate, for example by learning how to move and communicate within *Second Life*<sup>TM</sup>. Interactional adjustment usually means casual interactions are enabled within the new culture, namely inside or outside the *Second Life*<sup>TM</sup> learning facilitation space, and within or out of the *Second Life*<sup>TM</sup> higher education institution. Relational adjustment implies that efforts are made to maintain social networks with the learning facilitation communities formed within *Second Life*<sup>TM</sup>, together with non-trivial friendships. Students frequently report that their behaviour is more open, honest, and expressive in *Second Life*<sup>TM</sup>. Behavioural adjustments lead to *behavioural survival* in *Second Life*<sup>TM</sup> learning facilitation situations, just as affective and cognitive adoptions lead to affective and cognitive survival (Fizsimons, 2012).

#### **2.4.4.3 Cognitive survival**

*Second Life*<sup>TM</sup> cognitively challenges the assumptions, beliefs, opinions and understanding that students have of learning facilitation. An interactive process amongst students in *Second Life*<sup>TM</sup> to gain knowledge and reflect on the acquired insights, often leads to overcoming cognitive challenges (Fizsimons, 2012). *Cognitive survival* occurs because of an increased tolerance for various cultures and worldviews in *Second Life*<sup>TM</sup>. Cognitive dialogue with other students in *Second Life*<sup>TM</sup> is further experienced as informative and thought provoking. If cognitive struggles are overcome and cognitive insight is gained in virtual learning facilitation methodology, connections are formed between classroom practice and *Second Life*<sup>TM</sup> experiences, and when students reflect on learning facilitation practice inworld, then cognitive survival of avatars in *Second Life*<sup>TM</sup> ensues. Cognitive identification with the avatar representing the student also occurs in *Second Life*<sup>TM</sup>, which assists with the adjustment to learning in this domain (Fizsimons, 2012). Cognitive connection influences the usage and worth that the web-user attributes to the avatar. If students identify with their avatars, this cognitive identification leads to a feeling of being absorbed, and it has cognitive survival as consequence. Affective, behavioural, and cognitive survival leads to transformative learning.

#### **2.4.5 Transformation phase**

Transformative learning occurs during the *transformation phase* of virtual world adjustment. It happens because of the successful progression through the orientation-

the euphoria-, the crisis- and the survival phases. Interaction and engagement in *Second Life*<sup>TM</sup> stimulate the progression through the phases. Transformative learning is however not a metamorphosis that occurs overnight, but a process. Transformation leads to deeper comprehension and knowledge (Fizsimons, 2012). A movement from fear to familiarity occurs because of reflexivity, reflective practices, and world mindedness<sup>7</sup>, which is central to transformative learning. In this way, students learn and are being changed by their *Second Life*<sup>TM</sup> experience. World mindedness is enhanced by technology, because it enables opportunities within societies, bridging boundaries between regions, borders, or nations (Fizsimons, 2012). Figure 2.6 highlights the transformation phase.

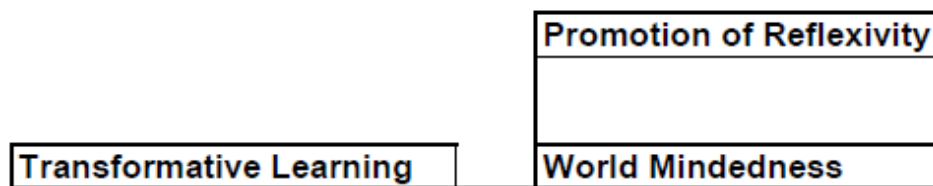


Figure 2.6: Transformation Phase, Virtual World Adjustment Theory (Fizsimons, 2012:171)

Virtual world learning theories, such as the explained Virtual World Adjustment Theory, remain scarce; and even more so *Second Life*<sup>TM</sup> learning theories (Archambault, Leary & Rice, 2022). The finite number of these learning theories is evident and the statement of Loke (2015:122) remains valid, namely “educators have yet to adequately theorise how students’ virtual world experiences bring about this learning”. It needs to be noted that instructional designers did employ and incorporated frameworks for online learning in virtual worlds and it had positive results on the motivation and engagement of students, which bettered learning (Christopoulos, Conrad & Shukla, 2019).

Therefore, key concepts that came to the fore from the online learning theories and considered applicable for learning in *Second Life*<sup>TM</sup> were integrated with the Virtual World Adjustment Theory (see Figure 2.7) and an adapted theory is proposed (see

<sup>7</sup>World mindedness leads avatars to perceive different ethnic, national, or religious perspectives as worthy (Fizsimons, 2012). It develops when students as avatars are afforded the chance to learn about, with, an in a complex connected world, such as *Second Life*<sup>TM</sup>.

Figure 2.8). This adapted theory contributes to the development of theoretical frameworks in the field of learning facilitation in virtual worlds, especially in *Second Life*<sup>TM</sup>. Furthermore, the adapted theory stemming from non-empirical research (Babbie & Mouton, 2002), reacts to the first research question of this study, namely: What are the constituents of an appropriate theoretical framework for the facilitation of learning in *Second Life*<sup>TM</sup> at an African University?

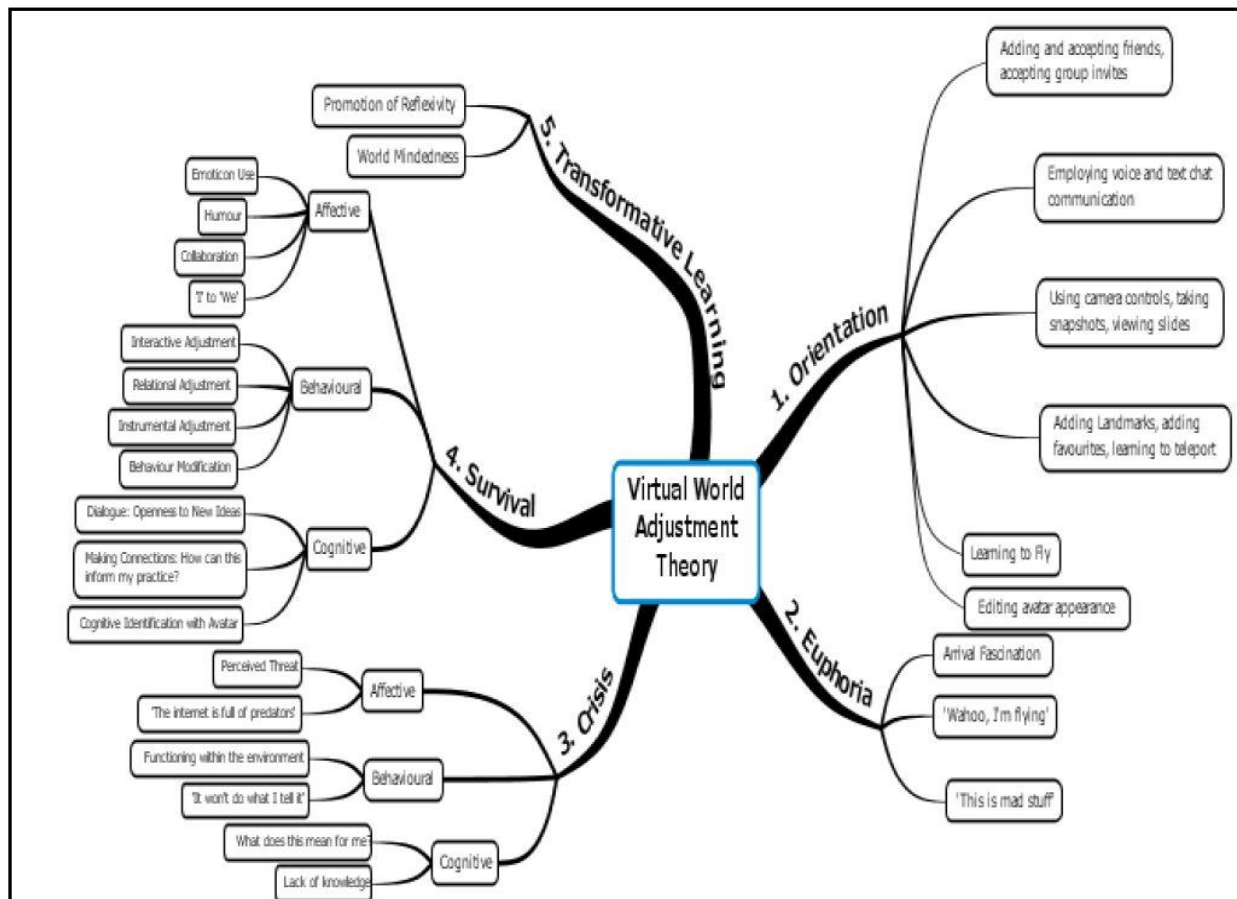


Figure 2.7: Virtual World Adjustment Theory (Fizsimons, 2012:178)

## 2.5 Adapted Virtual World Adjustment Theory

The Virtual World Adjustment Theory (Fizsimons, 2012) upholds a static dendrite-like format. But an adapted Virtual World Adjustment Theory is proposed in this study, whereby the Virtual World Adjustment Theory is adapted from its static nature to cyclical motion by means of the integration of key concepts from online learning theories or instructional design models. The foreseen cyclical motion is created by proposed conceptual energy nodes, originating from the key concepts of the online learning theories, and strategically positioned as part of each of the phases. These

conceptual energy nodes stem from the explained Connectivism, Multimodality Theory, Technology Acceptance Model, and the Pebble-in-the-Pond Instructional Design Model (see section 2.3). The energy from the nodes, flowing into the five phases of the static dendrite-like Virtual World Adjustment Theory, keeps the learning process in motion. The proposed cyclical motion of the learning process is portrayed by the dotted lines in Figure 2.7 below, which displays the adapted Virtual World Adjustment Theory. In this figure, the following abbreviations are used: C = Connectivism, M = Multimodality Theory, TAM = Technology Acceptance Model and PP = the Pebble-in-the-Pond Instructional Design Model. The learning cycle does not end at the transformative stage, as shown in the Virtual World Adjustment Theory. The learning moves into another cycle of learning, by re-entering the orientation phase. This process of learning is typical of Action Learning cycles and empowering of students happens by the repeated cycles of learning proposed by the adapted theory.

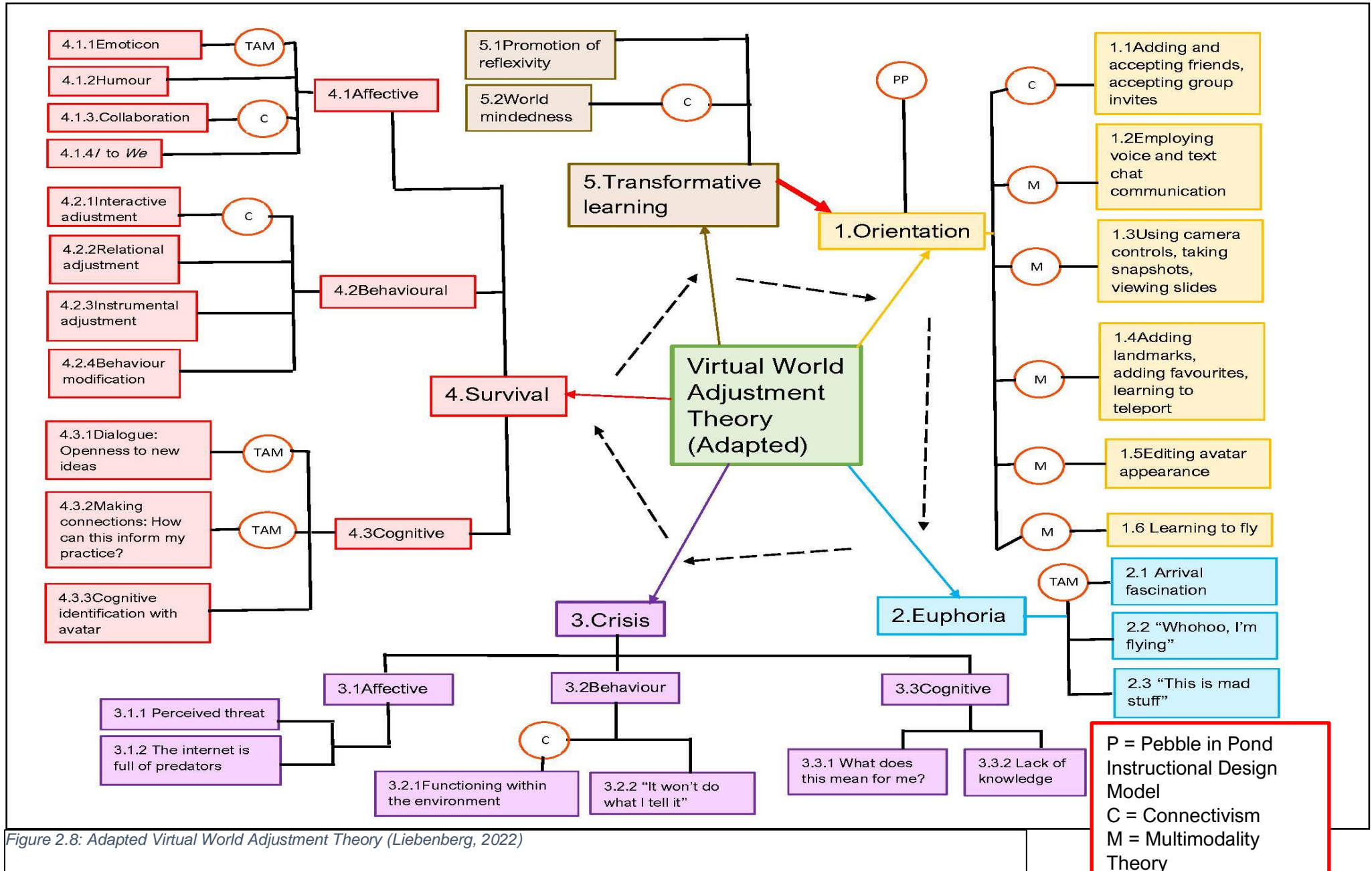


Figure 2.8: Adapted Virtual World Adjustment Theory (Liebenberg, 2022)

### 2.5.1 Key concepts of Connectivism integrated into the Virtual World Adjustment Theory

Learning in *Second Life*<sup>TM</sup> occurs because of the connections, discussions, debates and engagement amongst avatars, the *Second Life*<sup>TM</sup> environment and artefacts. These key concepts from Connectivism are therefore incorporated into the Virtual World Adjustment Theory. They add value to, and have an energising effect on, the Orientation-, Crisis-, Survival- and Transformative phases of the Virtual World Adjustment Theory (see Figure 2.8).

During the Orientation phase, key concepts of Connectivism, namely connections, discussions and engagement amongst avatars, the *Second Life*<sup>TM</sup> environment and artefacts immediately become applicable. Avatars *add and accept friends, as well as group invites* (see 1.1 in Figure 2.8). This intersection between the Orientation phase and the key elements of Connectivism creates an energy node that initiates the learning process. When avatars are experiencing behaviour crises, especially regarding *functioning within the environment* (see 3.2.1 in Figure 2.8) during the Crisis phase, they must grapple with an abundance of diverse opinions on behaviour and actions in *Second Life*<sup>TM</sup>. Connectivism is applicable at this node, because this theory states that learning occurs because of the interaction among humans, as well as the actions and behaviour taking place between humans and inanimate objects.

Behavioural struggles are overcome during the Survival phase by means of acts of survival behaviour as seen in *interactive adjustment* (see 4.2.1 in Figure 2.8). Connectivism intersects with survival behaviour and at this stage, students are energised to learn by virtue of the variety and accumulated knowledge from various connections in *Second Life*<sup>TM</sup>. Affective survival that occurs in the Survival phase, by means of *collaboration* (see 4.1.3 in Figure 2.8), links with the energising elements of Connectivism. This theory states that learning mirrors society, cultures and beliefs obtained from collaboration. During the Transformation phase, *world mindedness* (see 5.2 in Figure 2.8) occurs because learning in *Second Life*<sup>TM</sup> is recent in a current, fluid system of networked avatars, globally. The energy nodes from the key features of Connectivism within the Virtual World Adjustment Theory keeps learning in motion and ongoing.

### 2.5.2 Key concepts of the Multimodality Theory integrated into the Virtual World Adjustment Theory

A key concept of the Multimodality Theory is the importance attributed to sensory engagement in learning. Avatars learn because of their senses being engaged by means of physical media that they experience during learning facilitation in *Second Life*<sup>™</sup>. The key concepts and energising nodes of the Multimodality Theory are especially vivid during the Orientation phase in the Virtual World Adjustment Theory. It is pertinent with the *employing voice and text communication* (see 1.2 in Figure 2.8) where the sense of hearing is coupled with the physical mode of acoustics and sound waves and the sense of sight is coupled with the physical mode of graphics and light. *Using camera controls, taking snapshots, and viewing slides* (see 1.3 in Figure 2.8) attract the sense of sight coupled with the physical mode of graphics and light. When *adding landmarks and favourites* (see 1.4 in Figure 2.8), the sense of sight is linked to the physical mode of graphics and light. When *editing avatar appearance* (see 1.5 in Figure 2.8) becomes applicable, the sense of sight is combined with the physical mode of graphics and light. *Learning to teleport and fly* (see 1.6 in Figure 2.8) connects with the sense of proprioception and links with the physical mode of a sense of gravity defiance. These key concepts of the Multimodality Theory have therefore been integrated into the Virtual World Adjustment Theory, which sets learning into motion and maintaining it.

### 2.5.3 Key concepts of the Technology Acceptance Model integrated into the Virtual World Adjustment Theory

Key elements from the Technology Acceptance Model that were integrated into the Virtual World Adjustment Theory to adapt the theory, are Perceived Use, Perceived Ease of Use and Enjoyment. These elements are prevalent and energising in the Euphoria phase and Survival phase of the Virtual World Adjustment Theory. During the Euphoria phase, *arrival fascination* (see 2.1 in Figure 2.8) is paramount. This element intersects with the Perceived Ease of Use concept of the Technology Acceptance Model, bringing and keeping learning in motion. Affective survival shown with *Emoticons* (See 4.1.1 in Figure 2.8) in the Virtual World Adjustment Theory links with the Enjoyment factor of the Technology Acceptance Model, which stimulates the learning process in *Second Life*<sup>™</sup>. A positive attitude because of Perceived Ease of Use is seen in *Dialogue: Openness to new ideas* (see 4.3.1 in Figure 2.8) during the

Survival phase. This links to Cognitive Survival within the Virtual World Adjustment Theory and overcome cognitive challenges towards learning in *Second Life*<sup>TM</sup>. Simultaneously *Connections are made: How can this inform my practice?* (See 4.3.2 in Figure 2.8) expresses Perceived Use according to the Technology Acceptance Model. This confluence brings energy to the learning process in *Second Life*<sup>TM</sup>, maintaining the learning motion.

#### **2.5.4 Key concepts of the Pebble-in-the-Pond Instructional Design Model integrated into the Virtual World Adjustment Theory**

The Pebble-in-the-Pond Instructional Design Model is a systematic and structured representation of learning that happens based on a problem presented to students, for which a solution must be sought. The initial pebble in the metaphoric learning pond is represented by a problem posed to students. This pebble creates a conceptual energising node during the Orientation phase of the Virtual World Adjustment Theory, because of the problem presented to students on how to enter and learn in *Second Life*<sup>TM</sup> (see 1 in Figure 2.8). In this way, the learning process comes into motion and continuous in a cyclical manner. The Pebble-in-the-Pond Instructional Design Model has a linear-circular approach to learning, while the Virtual World Adjustment Theory is flexible with feedback circulating back towards students. Therefore, only relevant elements are taken from the Pebble in the Pond Instructional Design Model and integrated into the Virtual World Adjustment Theory. Furthermore, the Pebble-in-the-Pond Instructional Design Model views learning from one angle, namely the sequencing of meaningful pebbles. In *Second Life*<sup>TM</sup>, a variety of angles is used during learning facilitation and re-evaluation occurs during the learning process.

Based on the interconnections and key concepts of online learning theories and models, the adapted Virtual World Adjustment Theory (see Figure 2.8) is proposed in this study for learning in *Second Life*<sup>TM</sup>.

## **2.6 Conclusion**

The theoretical framework used in this study, namely the eclectic theoretical framework, was outlined. The three main groups of theories in the eclectic theoretical framework were discussed, namely Action Learning Action Research, online learning

theories and the Virtual World Adjustment Theory. The Ethnographic theory, Grounded Theory and the African Theory of Knowledge that informs Action Learning Action Research were briefly discussed. The connectedness and experiences with human senses from the Multimodality Theory relates to the beliefs in the African Theory of Knowledge on learning. The Action Learning Action Research with the embedded theories provide an appropriate foundation for the research design in this study. It also makes provision for an African setting and sets the space for the creation of new knowledge.

Online learning theories with key features applicable to the Virtual World Adjustment Theory, namely Connectivism, Multimodality Theory, Technology Acceptance Model, Pebble-in-the-Pond Instructional Design Model, were also outlined. Special attention was given to the Virtual World Adjustment Theory (Fizsimons, 2012). Key concepts were taken from the online learning theories and integrated into the Virtual World Adjustment Theory to create an adapted Virtual World Adjustment Theory. This theory is adaptable and flexible, incorporating key concepts of current connectedness in learning, experiencing phenomena to be learned with as many senses as possible, believing in the usefulness of the knowledge to be acquired and using a problem-solving approach.

The study plan (see Figure 1.3) shows that the theoretical framework influences the commencement of the landscape exploration of *Second Life*<sup>TM</sup> in the next chapter. In Chapter 3 the non-empirical research, namely the literature review for this study follows.

## CHAPTER 3

# VIRTUAL WORLDS AND *SECOND LIFE*<sup>TM</sup> IN HIGHER EDUCATION

### 3.1 Introduction

The vision of this study is the reshaping of higher education learning facilitation in the developing continent of Africa through *Second Life*<sup>TM</sup>. As the study plan in Figure 1.3 in section 1.8 indicates, the study commences with a landscape exploration of *Second Life*<sup>TM</sup>. This landscape exploration starts with the non-empirical research of the literature review. The position of the literature review in the ALAR-guided research design is highlighted in Figure 3.1 below.

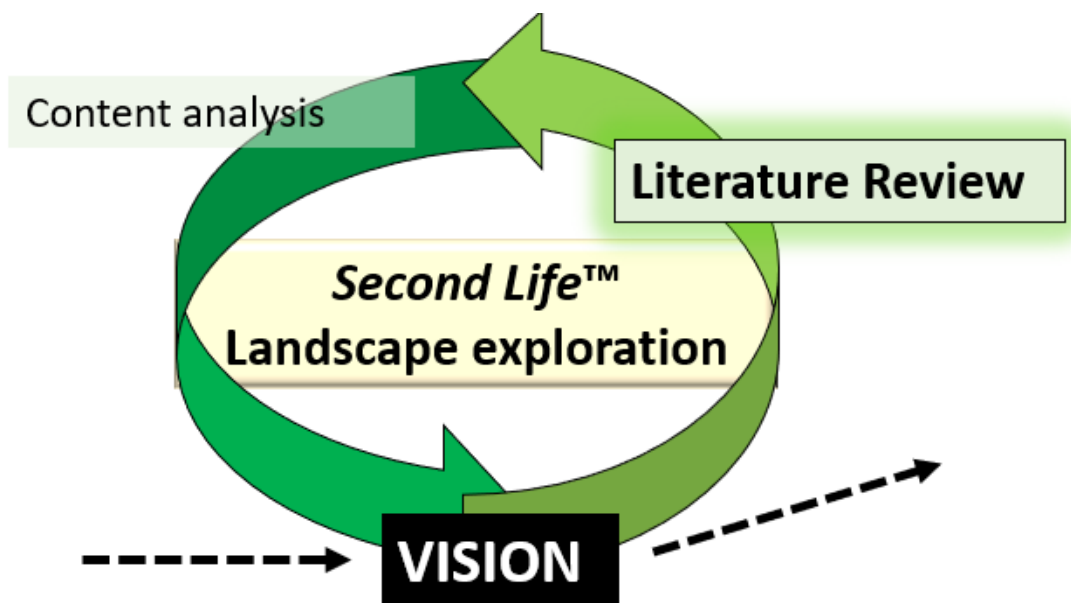


Figure 3.1: Exploration of higher education learning facilitation in *Second Life*<sup>TM</sup> in the literature review (Liebenberg, 2022)

The organisation of this literature review tracks some evolutionary trends of usage of technologies in higher education learning from Web 2.0 to virtual worlds, specifically *Second Life*<sup>TM</sup>. Therefore, the literature review has an order of growth, unfolding an

evolution of technology. The literature review first considered how higher education has been changed by technology globally. Thereafter the technology landscape for higher education learning facilitation in Africa is viewed. Higher education web-user groups on a technology limited continent are then regarded. An explanation of the evolution of the World Wide Web and its offerings for higher education learning facilitation follows. Thereafter an exposé of virtual worlds and the advantages and disadvantages thereof for learning facilitation in higher education are uncovered. A detailed inquiry is then launched into the specific virtual world of *Second Life*<sup>™</sup>, evaluating its benefits and limitations for learning facilitation in higher education. Considerations are then developed by the researcher for the setting up of a higher education learning facilitation space in *Second Life*<sup>™</sup> in Africa, which concludes the chapter.

## **3.2 Technology-driven changes in higher education**

Molly Broad, a former president of the American Council on Education (ACE), states that “business as usual is not in the future cards” of higher education (Grajek, 2018:32). Technology has moved rapidly into the world of higher education. Examples of the expeditious technological advancements and technology-driven changes in higher education are the acceleration in data- and text-analysis software, data visualisation (Armstrong, 2022), the expansion of open educational resources (Veletsianos, 2021) and a foreseen unhackable internet based on quantum physics (Juskalian, 2020). Simultaneously, the global demand for access to higher education keeps rising at an unprecedented rate (Calderon, 2018). There has been an immense increase in student enrolment numbers at higher education institutions worldwide, with numbers advancing from 32,6 million (1970) to a projected 594,1 million students by 2040.

Technology-driven changes and the increasing demand for access to higher education create an opportunity for the higher education sector to enter a golden era if all the role-players embrace innovative initiatives (Dayagbil, Palompon, Garcia & Olvido, 2021). Technology traverses barriers enabling students to “have on-demand access to courses, learning resources, peers, teachers and content experts at anytime from their personal gadgets and computers” (Gurung & Limbu, 2017:72). Students are enabled with

asynchronous learning to learn at whatever time of the day or night, and from any locality. Facilitators and their students can stay anywhere and connect online, with limitations to access increasingly upheaved by technological improvements (Maatuk, Elberkawi, Aljawarneh, Hasan & Hadeel, 2022; Winthrop, 2020). This argument is even more true with Covid-19, which is altering the previously known world order, higher education and traditional concepts. This single virus is forcing universities globally to rethink their academic projects and operation, with technology playing a pertinent role in reshaping this sector (Mohamedbhai, 2020).

Offering online learning, digital content to students and cloud-based services is not merely supplementary anymore; it has become imperative (Edvantic, 2022). This obligation resonates with the Top Ten IT issues in Higher Education (Grajek, 2021; Grajek, 2022); the Top Strategic Technology Trends (Gartner, 2021; Gartner, 2022); and The Horizon Report for Teaching and Learning on technology movements (Pelletier, Brown, Brooks, McCormack, Reeve & Arbino, 2021; Pelletier, Brown, Brooks, McCormack, Reeve & Arbino, 2022). These leading issues and trends are tabulated in Table 3.1 and the shaded cells within the table show where the aim of this study intersects with the current issues, strategic technology trends and technology movements in higher education.

**Table 3.1 Top Ten IT issues in Higher Education, Gartner's top strategic technology trends and the Horizon Report on Teaching and Learning (Gartner, 2020; Gartner, 2021; Grajek, 2021; Grajek, 2022; Pelletier, et al., 2021; Pelletier, et al., 2022)**

Top Ten IT issues in Higher Education		Gartner's top strategic technology trends		Horizon Report on Teaching and Learning	
2021	2022	2021	2022	2021	2022
Embracing digital transformation	Cyber everywhere	Internet of behaviours	Data fabric	Artificial intelligence (AI)	AI for Learning Analytics
Faculty to have the necessary digital fluency	Evolve or become extinct	A total experience strategy	Cybersecurity mesh	Blended and hybrid course models	AI for learning tools
Embracing a blended campus with digital and in-person learning	Digital faculty for a digital future	Privacy enhancing computing	Privacy enhancing computation	Quality online learning	Mainstreaming hybrid/remote learning modes
Restore after Covid-19	Learning from Covid-19 to build a better future	Distributed cloud	Cloud-native platforms	Learning analytics	Microcredentialing
Evolve after Covid-19	The digital vs the brick-and-mortar	Anywhere operations	Composable applications	Microcredentialing	Professional development for hybrid/remote teaching
Weather the shift to the Cloud	From digital scarcity to digital abundance	Cybersecurity mesh	Decision intelligence	Open educational resources (OER)	Hybrid learning spaces
Produce technology systems that are student-centric and equity minded	The shrinking world of higher education or an expanded opportunity?	Intelligent composable business	Hyper-automation & Autonomic systems		
Foster equitable digital access for students	Weathering the shift to the cloud	AI engineering	Distributed enterprise		
Developing technology-enhanced post-pandemic institutional vision	Can we learn from a crisis?	Hyper-automation	Total experience		
Learning spaces that foster creative practices and collaboration	Radical creativity	Combinatorial innovation	AI engineering & Generative AI		

Some of the technologies that have already transformed higher education learning facilitation are described briefly below. These technologies have already been researched extensively and their influence on higher education learning facilitation fall beyond the scope and aim of this doctoral study. It is the aim of this study to explore how learning can be effectively facilitated in a *Second Life*<sup>TM</sup> classroom at an African University.

### **3.2.1 Examples of technologies that transformed higher education**

Technologies that have changed higher education are divided by Heick (2021) into four categories; namely, video and audio; interaction; virtual classrooms; and learning personalisation. This study follows the categorisation of Heick (2021), but acknowledges that various categorisations of the technologies that transformed higher education exist. Pang (2021) differentiates categories of artificial intelligence; data analytics; blended and hybrid course models; expansion of open educational resources, microcredentials and business opportunities and quality online learning. Bayern (2019) agrees with Pang (2021) in terms of artificial intelligence; and predictive analytics, but further grouped technologies into smart campuses; nudge technology; digital credentialing technology; hybrid integration platforms; career software and wireless presentation technology. The categorisation of Heick (2021) follows.

#### **3.2.1.1 Video and Audio**

Video and audio are grouped into live video streaming; podcasts; and wearable devices. Vlachopoulos and Jan (2020) describe **live video streaming** as the simultaneous internet broadcasts of face-to-face learning facilitation sessions. Non-holographic and holographic live video streaming changed traditional classroom facilitation by learners that can be remote in physical space, but simultaneously and synchronously attend the same learning facilitation session in real-time (Miner & Stefaniak, 2018). Since the emergence of Covid-19, live video streaming learning facilitation increased on video-conferencing platforms, such as Microsoft Teams, Skype and Zoom. This technology offers flexible learning options; assists students who are unable to attend classes; removes geographical barriers to learning; ensures comfortable accessibility for busy students; caters for different learning strategies; offsets the cost of university

infrastructure; and allows practitioners from industry into classrooms without travelling (Orcos & Magreñán, 2018; Rossouw, 2018; Scagnoli, Choo & Tian, 2019; Themelis, 2022). The downside of live video streaming sessions is that it sometimes has a negative effect on on-campus class attendance (Edwards & Clinton, 2019) and a subsequent loneliness, because of the absence of interaction with peers. When opting for this technology, facilitators need to remember the positive correlation between performance, skills development and learning from face-to-face on-campus class attendance (Sloan, Manns, Mellor & Jeffries, 2020).

**Podcasts** transfer digital audio files over the internet and these files can be downloaded to any mobile device (Makina, 2020). This technology changed learning facilitation by being substitutional (recordings of past lectures) and supplementary (additional review notes). Kaplan, Verma and Sargsyan (2020) state that the advantages of podcasts are that they reduce the transactional distance between students and their facilitators; provide simple and flexible access to quality educational information; overarch racial, gender, geographic or physical divides; and augment facilitation and learning anytime and anywhere (Makina, 2020; Mooney, 2019). A disadvantage of podcasts is that if recordings are not carefully planned, students may stagnate and *just* listen to the relaying of content without any other senses involved. This leads to lower levels of cognitive functioning (Mooney, 2019). Podcasts and their mere availability do not automatically improve facilitation and learning, but the quality of podcasts is key (Makina, 2020).

**Wearable devices** are wearable, mobile, user-centred, interactive and have augmented reality characteristics (Pan, Sivo & Graham, 2021). This technology combines the functionality of the internet with smart sensor technology (Gao & Yu, 2021). Wearable devices changed learning facilitation because of their portability; ease of use; ability to transcend space and time; as well as their tracking functionality of successes and challenges. They provide data support in real-time and analyse the performance of students and the difficulties they encounter. These enable immediate intervention and feedback (Gao & Yu, 2021). A disadvantage of wearable devices is data security when it comes to data storage, and web-based student profiling.

### 3.2.1.2 Interaction

Interaction comprises video games and simulation; interactive whiteboards; as well as augmented and virtual reality. **Video games** are the online interaction between players and machines; mediated by a fictional context (Underwood & Goetz, 2021). **Simulation** is miniaturised representations of reality that take students to digital worlds whereby they use their knowledge, skills and strategies to perform assigned roles (Dudziak & Stoma, 2020; Stoma, Dudziak & Rydzak, 2020). Rules play a key part in video games and simulation, together with specific goals to be achieved. Rewards as part of video games and simulation lead to positive feedback that reinforces learning (Stoma, et al., 2020). Video games and simulation changed higher education, because these technologies provide protected spaces for learning, allowing for practising in these environments without real-effect harm (Clarke, Masters, Collins, Flynn & Arnab, 2020; Underwood & Goetz, 2021). These technologies bring theory into practice; release creativity; stimulate learning by means of play (Dudziak & Stoma, 2020) and stand in contrast to the passive act of reading or presentations delivered to students (Stoma, et al., 2020; Underwood & Goetz, 2021). The challenge with video gaming and simulation is that new video games and simulations need to be produced frequently, because the attention levels of students may decrease if the novelty of video game-based learning and simulation wears off after repeated use (Clarke, et al., 2020). In addition, a challenge in the uptake of video games and simulation may arise from the side of facilitators if they are not fluent with these technologies or do not deem them relevant for learning in their subject field (Dudziak & Stoma, 2020; Hernández-Lara, Perera-Lluna & Serradell-López, 2019).

**Interactive whiteboards** or SMART boards can be used during learning facilitation to write on, display visual material, project documents, show animations, search for information online, drag and drop content from one source to the other or play video and audio clips (Tombak & Ateskan, 2019). Interactive whiteboards changed higher education because of the collaboration that they enable and the ubiquity of information that this technology brings. The advantages of interactive whiteboards are that they forge a paradigm shift towards collaboration, which lies at the heart of pedagogy (Tombak &

Ateskan, 2019). Interactivity is enhanced by the numerous pictures, diagrams, animations and photos that can be displayed on, and shared by, interactive whiteboards. Habeeb (2018) indicates that the use of interactive whiteboards enhances academic performance. The disadvantages of interactive whiteboards include the time and effort to learn how to use them, skepticism about the value that they add to learning facilitation (Ozoemena, 2018) and problematic internet connectivity that may disrupt the use of the SMART boards during learning facilitation (Samsonova, 2022).

**Augmented reality** views an actual environment in real time, improved by computer-assisted technology and virtual information added to existing physical information. This technology overprints computer data onto the real world (Rodríguez-Abad, Fernández-de-la-Iglesia, Martínez-Santos, & Rodríguez-González, 2021). **Virtual reality** means three-dimensional, computer-generated environments that are built for immersion (Mystakidis, Berki & Valtanen, 2021). For this study, virtual reality is viewed as immersive artificial three-dimensional worlds, generated by digital practice that replace real environments with simulated ones (González-Zamar, Abad-Segura, López-Meneses & Gómez-Galán, 2020). What augmented reality brought to learning facilitation, is three-dimensional images of objects; dissemination of these objects in their constituent elements; and rotation of artefacts in this space with additional explanations added to them (Sáez-López, Cózar-Gutiérrez, González-Calero, Gómez & Carrasco, 2020). Virtual reality broke the barriers of formal education by enabling access to quality education in an immersive and abstract way (González-Zamar, et al., 2020). The advantages of both augmented reality and virtual reality in learning facilitation are that these realities are intriguing to students; the attention of modern students is kept longer; their interest in the educational material is increased; their activity during learning facilitation sessions is heightened; and they are motivated to explore further (Mystakidis, et al., 2021; Nesenbergs, Valters, Ormanis & Mednis, 2021). Critical discourse is often activated by these technologies, which lead to constructive, authentic and reflective deep learning (Rodríguez-Abad, et al., 2021; Zhang & Lv, 2020). A disadvantage of both is noted by McBain, Habib, Laggis, Quaiattini, Ventura and Noel (2022) that they did not find any increase in academic performance with the use of augmented and virtual reality. These

findings are in contrast to results of Quqandi, Joy and Drumm (2018), showing better academic results. The use of these technologies may lead to cognitive overload, with a consequential decrease in performance. Furthermore, even if knowledge-, skills- and abilities-based learning occurs, this does not necessarily imply deep and meaningful learning (Mystakidis, et al., 2021). Facilitators need to be sensitive that technology does not get into the way of learning. Quqandi and Mike (2018) point out that carefully designed learning activities with this technology are much more important than exotic interfaces, because technology and design alone do not make learning happen.

### 3.2.1.3 Virtual classrooms

Virtual classrooms are grouped according to learning management systems; asynchronous learning platforms; and online collaboration spaces. **Learning management systems** administer online resources and content, provide platforms for discussion and collaboration, as well as evaluate students through quizzes, assignments and formative assesment (Aldiab, Chowdhury, Kootsookos, Alam & Allhibi, 2019). Learning management systems have changed higher education, based on the vast repository of educational sources provided to students (Findik-Coskuncay, Alkis, & Özkan-Yildirim, 2018). Advantages of these systems are the accessibility to information and on-demand availability; standardised course content delivery online, video and audio availability that can be shared or re-used; structured storage of resources; self-pacing; convenience; synchronous or asynchronous interactivity and online discussions (Mershad & Wakim, 2018; Sharifov, Safikhanova & Mustafa, 2021). Learning management systems also play a significant role in learning facilitation during unrest, war and pandemics, such as Covid-19 (Matarirano, Panicker, Jere & Maliwa, 2021). A pertinent disadvantage of these systems is that students with low motivation levels may not achieve their learning goals, because they are not monitored physically. Flexibility may lead to laziness in the absence of a structured schedule, with the consequence of increased dropouts. Deep learning cannot really be assessed, because computer-marked assessments are more knowledge-based than practice-based (Chang, Su & Hajiyev, 2017; Findik-Coskuncay, et al., 2018).

**Asynchronous learning platforms**, such as discussion boards and social media inscriptions, allow students flexible access to digital learning content to follow at their own pace (Karaaslan, Kilic, Guven Yalcin & Gullu, 2018). The way in which asynchronous learning platforms changed higher education is that this technology removed the traditional classroom and created a decentralised, online knowledge base where students can gather from and contribute to (Karaaslan, et al., 2018). Advantages of asynchronous learning platforms are that students can access and share information and experiences with others when it suits them (Yarrison, 2021). Critical thinking becomes possible, because students have more time to reflect on subject knowledge, process the information and interact with it (Karaaslan, et al., 2018). When traditional classes are not possible, because of war and pandemics such as Covid-19, learning facilitation sessions can be captured and posted on asynchronous platforms. Disadvantages of these platforms are that real-time interaction and direct exchange of ideas are not possible. Peers and facilitators do not give immediate feedback to problems. Some students and facilitators experience asynchronous learning platforms as boring and a waste of time (Karaaslan, et al., 2018; Yarrison, 2021).

**Online collaboration spaces** allow for shared access to virtual work environments and common online workspaces instead of physical spaces (Fabrizz, Mendzheritskaya & Stehle, 2021). Examples of online collaboration spaces are Blackboard Collaborate (Blackboard Learn™, 2022) with collaborative whiteboard tools, Microsoft Teams (Microsoft Corporation, 2022) with recordable video performance options and Echo<sup>360</sup> (Echo<sup>360</sup>, 2022) with solutions for video recordings, streaming, audience engagement and analytics. Online collaborative spaces changed higher education learning facilitation, because online and hybrid environments were created for collaboration, leading to new activity systems (Marshalsey & Sclater, 2020). The advantage is that students may meet in online collaboration environments which are perceived by students and facilitators as more informal than traditional classroom learning facilitation spaces. But actions allowed for students in these spaces are limited and can easily be controlled by the facilitator of the learning facilitation session. The spaces for small group discussions, the break-away rooms, are like the traditional learning facilitation format. They are managed by the online

facilitator, just as in real life (Lally, Sclater & Brown, 2018). The emphasis on presence in online collaborative spaces must not outweigh the collaborative tasks at hand. Despite technology, pedagogy must stay central in learning facilitation in these spaces.

#### 3.2.1.4 Learning and personalisation

Learning and personalisation technologies are divided into groups of adaptive learning algorithms; recommendation engines; and haptic responses. **Adaptive learning algorithms** imply one-on-one tutoring at scale to address diverse student needs (Pfeiffer, Bezzina, Dingli, Wernbacher & Denk, 2021) and were developed from intelligent tutoring systems, educational data mining and learning analytics. Adaptive learning algorithms use mathematical functions to analyse student performance, and by complex algorithms suggest individual student learning packages, wherein the content and pace of the learning are continuously adapted (Lorenz & Saslow, 2019; Parmley, 2020; Renz & Hilbig, 2020). This technology changed learning facilitation because students receive algorithm-based individual and customised recommendations on what to learn next and in which order (Renz & Hilbig, 2020). But, as Mirata, Hirt & Bergamin (2020) explain, new technology in higher education is always caught between enthusiasm and rejection. For some, it is a long sought-after solution to challenges, while others see new technology as another step towards incapacitation (Dräger, Friedrich, Mordhorst, Müller & Röwert, 2017). Adaptive learning algorithms discover optimal learning sequences; deliver differentiated facilitation; and review the effects of different kinds of support. Advantages to adaptive learning algorithms are that studies showed that students that followed the guidance of adaptive learning algorithms, scored two standard deviations higher than students that received traditional learning facilitation (Phelps, 2020). Students themselves, in conjunction with the system, now shape their learning journey (Kayyali, 2021). A hampering factor may be the readiness of higher education institutions to implement data-driven adaptive learning algorithms (Gasevic, Tsai, Dawson & Pardo, 2019; Ifenthaler & Yau, 2020). Critics further query the ethical implications of adaptive learning algorithms and the future consequences for students whose data is collected here (Mavroudi, Giannakos & Krogstie, 2017). The collected data should have an agreed lifetime and mechanisms available for students to request for data deletion (Kabudi,

Pappas & Olsen, 2021). It is emphasised by Mirata, et al. (2020) that the more digital the facilitation, the more humane the content must be.

**Recommendation engines** suggest customised and tailor-made academic or educational information based on the online behaviour of students to help them find learning materials (Urdaneta-Ponte, Mendez-Zorrilla & Oleagordia-Ruiz, 2021). Recommendation engines draw inferences about preferences of students based on the information consulted online. This technology changed higher education, because these systems provide complementary information to students on their studies, based on observations of student behaviour (Dhawad, Sarkar, Agarwal & Darlapudi, 2021). Recommendation engines host the information of various systems in one single repository and make it available from there. Critique against recommendation engines is that they do not consider different student characteristics and the variety of their profiles.

**Haptic responses** flow from computer-assisted devices that bring a sense of touch through physical contact between students and their devices during learning facilitation. These responses leave a sense of realism amongst students when their touching senses are prompted (Bowers & Hayle, 2021). Haptic responses in higher education learning facilitation are still very new, but it brought rich, hands-on experiences to online learning facilitation (Walsh, Magana, Yuksel, Krs, Ngambeki, Berger & Benes, 2017). The advantages of haptic responses are that they enhance human-computer interaction and students feel more hands-on and present during learning facilitation (Bowers & Hayle, 2021). Interactivity and activity are increased, especially if compared to the passive technology of a keyboard and a mouse, that often disengages students. Haptic responses simulate immersive three-dimensional effects to help students understand abstract concept generation or when ideas are difficult to explain in words or visually. Complementary hereto, haptic responses provide access to all students, whether sighted or non-sighted. Haptic responses bring more to the online environment than sight and hearing, but also touching; which is a common way to interact with objects in the real world (Walsh, et al., 2017). Increased student engagement and motivation are observed when haptic responses are part of learning facilitation, leading to deep learning. The

challenge is that haptic devices bring a high visual load, with vibrancy of colour and complex texture, with the result that the combination of haptic and visual feedback during online learning facilitation may lead to cognitive overload (Bowers & Hayle, 2021).

### **3.3 Technology and higher education in Africa**

The focus of this section is to provide a brief overview of the technological infrastructure, online access, and student web-user groups on the developing continent of Africa, especially in South Africa. Kene-Okafor (2022) indicates that the African technology ecosystem received newly inspired consideration by means of venture capital from businesses globally, especially since 2019. It is believed that around \$2 billion were invested in African technology start-ups in 2019 and \$1.5 billion during 2020, despite the sombre influence of the Covid-19 pandemic on the world. With the reopening of businesses during 2021, with newly adopted habits in e-commerce and online learning facilitation, venture capital increased immensely in the field of technology. The actual investment in technology in Africa reached \$4 billion in 2021 (Ogunjuyigbe, 2022).

#### **3.3.1 Technological infrastructure**

The private sector served Africa well with the provision of ICT infrastructure, but investment and technological infrastructure in rural areas in Africa are still limited. Africa also faces the challenge of affordability, because even if infrastructure is available, it will not fulfil its purpose if the population of Africa cannot use it (Corrigan, 2020). Despite technological infrastructure growth in Africa, there are still huge deficits in this regard. The Covid-19 pandemic stressed the importance of ICT enabled processes in higher education learning facilitation. The African Union (AU) recognises how paramount ICT in Africa is and included it in the development strategy of the continent, namely Agenda 2063 (African Union Commission, 2015). Therein it is stated that Africa needs to become highly connected to streamline business, governance, and social interaction. Complementary hereto, the African Union also compiled the Draft Digital Transformation Strategy for Africa (2020-2030) crafting a coordinated response to reap the benefits of the Fourth Industrial Revolution in Africa (African Union Commission, 2020).

Technical infrastructure surrounding the continent of Africa, bringing internet connectivity to Africa, and linking the continent with the world, is improving. Table 3.2 shows the eight private undersea cable-systems from the East of the world and eleven private undersea cable-systems from the West of the world, connecting Africa with the rest of the world.

**Table 3.2: Undersea cable-systems surrounding Africa (ManyPossibilities, 2021)**

Internet undersea cables from the East and internet speed		Internet undersea cables from the West and internet speed	
SEAS	320 GB/s	SAT3/SAFE	800 GB/s
LION2	1.3 TB/s	GLO-1	2.5 TB/s
TEAMs	1.6 TB/s	MainOne	10 TB/s
EASSy	10 TB/s	NCSCS	12.8 TB/s
Seacom	12 TB/s	WACS	14.5 TB/s
METISS	24 TB/s	SHARE	16 TB/s
DARE1	60 TB/s	ACE	20 TB/s
PEACE	60 TB/s	SAIL	32 TB/s
		SACS	40 TB/s
		EllaLink	72 TB/s
		Equiano <sup>8</sup>	100 TB/s

A map of the internet undersea cables stretching from the West of the world, and linking the East of the world with Africa, is displayed in Figure 3.2 below. A further foreseen undersea cable-system surrounding the east and the west of Africa is *2Africa*, owned by Facebook. It will deliver internet connectivity of 180 TB/s from the fourth quarter of 2023. It is also anticipated that *Project TAARA*, owned by Google's parent company Alphabet (Hruby, 2021), will deliver internet to Africa by fibre or high-speed invisible streams of light by 2023.

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<sup>8</sup> Owned solely by Google (Hruby, 2021)

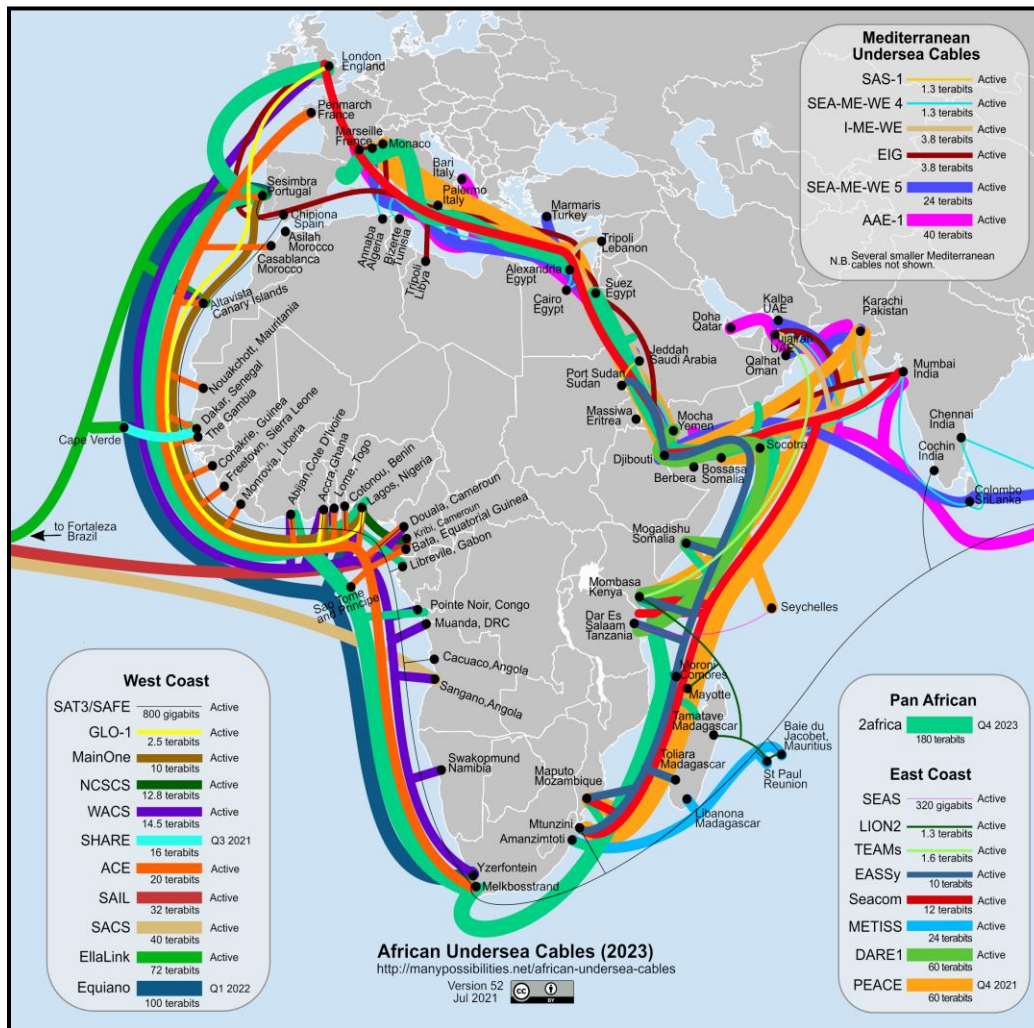


Figure 3.2: Internet undersea cables surrounding Africa (ManyPossibilities, 2021)

The South African National Research Network (SANReN), a high-speed internet network to provide an efficient system for science, education, and innovation internet traffic in South Africa, was constructed in 2007. This network can perform at a speed of at least 9,600 GB/s (Vermeulen, 2020).

### 3.3.2 Online access

At the start of 2022, Northern Europe had the highest internet penetration rate (98%) in the world, with the lowest observed in Middle Africa (24%). The internet penetration rate of Southern Africa was 66% (Statista, 2022), just above the world average (62,5%). A total of 594 million inhabitants of Africa were users of the internet in 2021 (Internet World

Stats, 2021), compared to 437 million in 2019 (Kemp, 2019) and 73 million in 2017 (Dahir, 2018). If internet users are expressed as a percentage of the population per continent, Africa takes the last position in the world with 43,2%. Figure 3.3 compares the internet users globally, expressed as a percentage of the continent population.

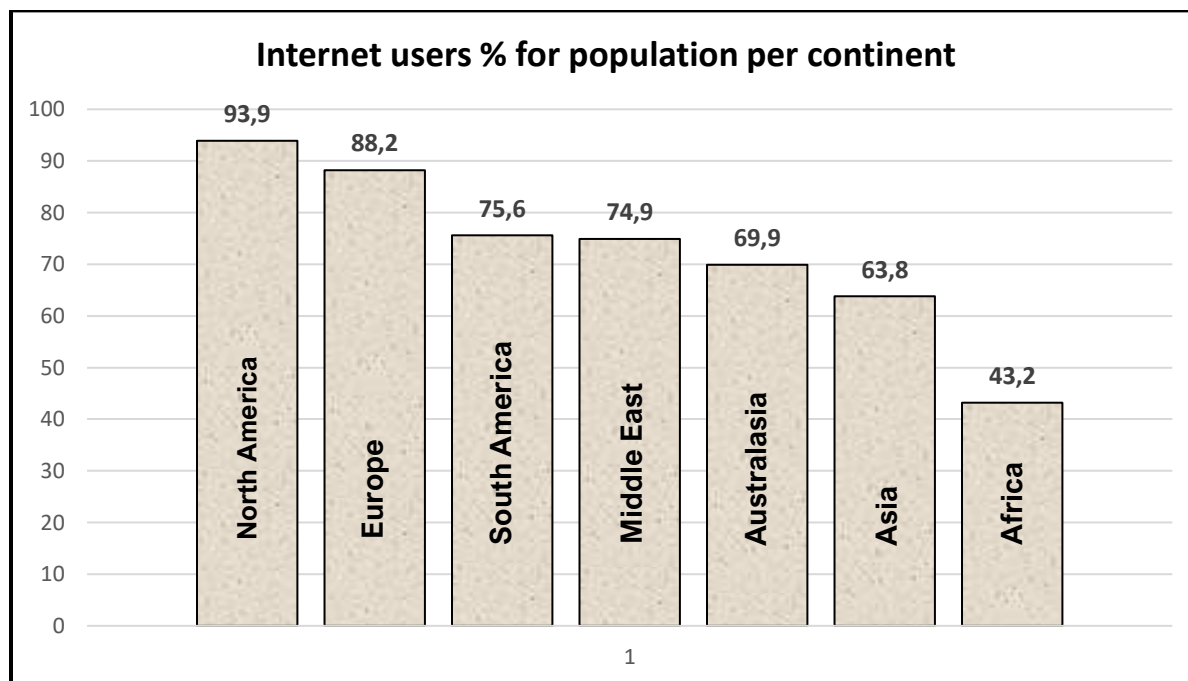


Figure 3.3: Internet percentage in terms of population per continent (Statista, 2022)

South Africa has a higher internet penetration percentage if compared to the average of the continent of Africa. Table 3.3 indicates the percentage of the South African population that uses the internet since 2015, until a projected 2023.

**Table 3.3: Internet penetration percentage in South Africa (International World Stats, 2021; Statista, 2022)**

	2015	2017	2018	2019	2022	2023
Percentage of South African population using the internet <sup>9</sup>	53%	59.7%	63.8%	67.7%	78,6%	80.8% (projected)

The internet is accessed in South Africa mainly by means of mobile devices (Ceci, 2022).

<sup>9</sup> The percentage of the South African population that uses the internet does not necessarily mean that the users **OWN** the devices to access the internet.

### 3.3.3 Higher education web-user groups

To explore how learning can be effectively facilitated in a *Second Life*<sup>TM</sup> classroom at an African University, technological infrastructure and online access must be considered in conjunction with the higher education web-user groups at tertiary institutions in Africa. This is a developing continent and technologically limited, compared to developed continents - which can be considered as technologically beneficial continents (Gonzales, 2021). There is still a digital divide between developed and developing continents. This means that a division exists between people on continents who have access to, and use, digital media, compared to those that do not on other continents. The divide between developed and developing continents also encompasses the motivation, or the absence thereof, to engage digitally and acquire these skills. The digital divide has led to a lack of innovation, development, and economic growth in countries on the continent of Africa. This effected in economic, cultural, and social inequality, with the cumulative effect of exclusion of people from society (Gonzales, 2021).

The digital divide in higher education also means that there is a difference between the developed and the developing world in the way academics facilitate and students learn when they are online, or when blended learning takes place. This divide further implies that some students can afford digital equipment, while others cannot (Kwakye, Kibort-Crocker, Lundgren & Paion, 2021), because of socio-economic status. Because of the digital divide, the reshaping of higher education learning facilitation in Africa cannot be merely applied without careful consideration of the web-user groups predominantly enrolled at higher education institutions on this continent. These web-user groups can be categorised into three clusters; namely, digital natives (Ordonez & Gonzales-Cordova, 2022); digital immigrants (Kenton, 2018); and digital strangers (Adjin-Tettey, 2020).

Digital natives are web-users who grew up with digital technology. These students live with technology in their daily lives. They assimilate knowledge rapidly because of their connectedness to resources and information. Digital natives usually own and enter higher education with one or more digital devices. By this time, they are technology savvy, because they learned informally from family, friends, social networks or at school how to

use their digital devices. Technology streamlines their lives, and they demand to receive higher education accordingly. They claim immediacy and appreciate networked skills. Digital natives are usually associated with Millennials, Generation Z and Generation Alpha, but some of Generation Y students can be included in this web-user group (Arévalo Aragón, 2020). Digital immigrants are web-users that did not grow up with digital technology. Therefore, they must acquire numerous technological skills that do not come spontaneously to them, and they find it difficult to learn how to use digital technologies. They are perceived as digitally slow, with low rates of adoption to new technology. Some catch up quickly with digital natives, but technological advancements are often resisted. Digital immigrants link mostly with Generation Z and Baby Boomers. Some of Generation Y also reside in this web-user group (Joa & Magsamen-Conrad, 2021).

Digital strangers are web-users who missed experiences with technology. These students have hardly used computers. They have fair access to the internet when on university campus, but limited access when off campus because of their living context when not on campus. This is due to no, or limited, digital technology ownership and connectivity. It may also be because of finite cell phone data for access when off campus. If computers are owned, most family members of digital strangers do not have knowledge in this field and cannot assist with computer-related challenges. Because of their background, they may perform poorly on computer literacy tests at HEIs. They depend on formal education to gain their ICT capabilities or by accidental learning. Digital strangers are usually associated with Millennials and Generation Z (Nawaz, 2020), and are prone to be from developing continents. There are researchers such as Czerniewicz and Brown (2014) that oppose the linkage between web-user groups and generations. But for this thesis, the debate is not furthered. Generations are rather viewed from the angle of reshaping higher education learning that cannot be merely applied in Africa without careful consideration of the web-user groups predominantly enrolled at their higher education institutions. In South Africa specifically, digital strangers are not unusual to digital technology in general, but mostly to computer-based technology. Most have access or exposure to cellular phones, although not necessarily smart phones. Their digital identity is mediated by cellular phone technology (Nevin & Schieman, 2021).

All three web-user groups need to be considered when technology is introduced, transferred, and used in Africa. The offerings of the World Wide Web and virtual worlds to learning facilitation in higher education in Africa must be viewed through the complex lens of technology infrastructure, access, and web-user groups on the continent of Africa.

### **3.4 Evolution of the World Wide Web and its offerings for higher education learning facilitation**

The World Wide Web (WWW), which enables all the technologies for higher education learning facilitation as discussed in this study, is explained in this section. The discussion flows from the existing Web 1.0 to Web 3.0 with a preview into the foreseen Web 4.0 to Web 6.0. The World Wide Web commenced in first generation format as Web 1.0, which was static, passive, mono-directional, finite, read-only and consisted mainly of information links (Pedofsky, 2021). Web-users were not able to interact with, or comment on, websites. They could only search and view the content of websites, which were mainly hypertext documents (Gosztonyi, 2022). Web 1.0 was used mainly to display information and resources statically through Uniform Resources Locators (URLs). In response to the development of Web 1.0, higher education institutions created policies on how technology could be optimally utilised in tertiary institutions and for learning facilitation (Khanzode, 2016). Web 2.0 was developed to overcome the main challenges of Web 1.0, which gave rise to the rapidity of technological advancements (Almeida, 2017).

This second generation of the World Wide Web is interactive and concentrates on the connections and communication among people all over the world. Web 2.0 enables the sharing of information, as well as the co-creation, regeneration, repurposing, and remixing of knowledge by web-users in a synergetic, bi-directional, sociable, cooperative, and collective manner (Gosztonyi, 2022). Thus, this generation of the web is an outlet for reflection and the expression of self-representation by individuals in a social context. Higher education was altered by Web 2.0 by shifting the focus to students to partake as creators, writers, adjudicators, and reviewers during learning facilitation (Isaías, 2021). With Web 2.0, the purpose of learning management systems transformed to platforms of social mediation where users generate content, and learning facilitation is interactive.

Social media, such as *Facebook*, *YouTube*, *Instagram*, and *TikTok*, as well as podcasts, chat rooms, folksonomies, blogs, and vlogs, emanated from Web 2.0 (Pedofsky, 2021). This second web generation allows for the sharing and repurposing of documents, videos, images, and mesh-ups. It enables collaborative knowledge production, instant messaging, social bookmarking, tagging, commenting, networking, syndication, and micro-blogging. Criticism of Web 2.0 is that it remains a web of documents and links between the documents. It resembles a universal file system with a low structural degree, which can be used by human beings only. It needs to be noted that online games and immersive virtual worlds, such as *Second Life*<sup>TM</sup>, emerged on the horizon of Web 2.0 (Hosch, 2022).

Web 3.0 acts as a semantic, decentralised web and stimulates knowledge networks (Pedofsky, 2021). This third generation of the World Wide Web aims at automation, integration, exploration, and the rehash of different applications. Open-source platforms, distributed databases, web personalisation, cloud computing, and the amalgamation of resources are characteristic of this web. In the Web 3.0 environment, data is not retained or reserved, but open to the public (Bhagat, 2021). The aim of Web 3.0 is to interrelate data and ensure that this data is easily accessible. Moreover, online search functions and websites are personalised, and embedded in context. These functions hinge on the internet records and preferences of the web-users. Web 3.0 imitates creativity and novelty, but it also assists with order in the social web (Gosztonyi, 2022). Within higher education, Web 3.0 enables virtual learning facilitation where students are immersed and engaged. This web also synthesises accumulated computer intelligence with the knowledge of its human counterparts to create more abundant, applicable, and timeous learning. Web 3.0 postulates: “machines first and humans thereafter” (Allyn, 2021:1). The future application of Web 3.0 of genetic algorithms, neural networks<sup>10</sup> and additional computer tool abilities, will augment the information gathered from the World Wide Web. Challenges related to Web 3.0 are its vastness, vagueness, and inconsistency of information.

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<sup>10</sup> Neural networks are systems of organic or artificial neurons that mimics the operations of the brain to identify relationships in data sets.

An ultra-intelligent electronic agent, and singled out for its integration, is foreseen as Web 4.0. It is an evolving web of intelligence connections and called the *Internet of Things* because humans are connected to devices that use the internet continuously. Web 4.0 is furthermore associated with Artificial Intelligence (AI)<sup>11</sup>, controlled interfaces, the comprehensive use of linked agents and nanotechnology, whereby automated reasoning can become reality. Web 4.0 operates on an infrastructure that is synchronised and networked (Gosztonyi, 2022), and aims at a symbiosis between machines and humans. This generation of the web is as potent as the brains of human beings, and operates parallel to the human brain (Pedofsky, 2021).

Web 5.0 is still an idea without a specific definition, but it is envisaged as a decentralised, smart communicator and an emotive, symbiotic web (Dorsey, 2022). This web generation will enable humans to be interlinked via smart communicators with their smart devices. The use of personal servers with customised data will disappear. Humans and devices will operate independently and interdependently via Web 5.0. Personal robots will operate their own avatars by means of their smart communicators. The current emotionally neutral and flat generations of the web will change with this generation of the web. The first four generations of the web do evoke emotions, but it is not a real-time, emotionally responsive platform. Web 5.0 will be a quasi-emotive web that will be conscious of the feelings of its web users (Dorsey, 2022). However, caution will be needed to ensure that Web 5.0 does not evolve into a devious and unruly space.

Web 6.0 will be characterised by web service extensions, which are programs working together with the existing Information Services Managers (ISM) of the Internet to extend the basic Internet Information Services (IIS). Examples of web service extensions are the Common Gateway Interface (CGI) and Web Distributed Authoring and Versioning (Web DAV). The extended IIS produces web-hosting services by means of adjustable architecture - which allows server resources to be governed with better efficiency, stability, and performance. The expanded IIS can also autonomously detect faulty

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<sup>11</sup> When computers become competent enough to think, argue, respond, converse, and behave like humans, it is called AI.

processes, over-burdened resources, and memory leaks. If a problem is detected, IIS will shut down the relevant application, redeploy faulty resources and link analytical tools with faulty processes. Web 6.0 will be a robust performer, because it will be self-healing and it will debug automatically (Önday, 2019). The evolution of the web generations has significant implications for higher education and learning, each time a next generation is entered.

### **3.5 Virtual worlds and higher education learning facilitation**

For some, the purest form of reality is still real environments and virtual reality is seen as separate from reality. However, increasingly, these two realities are not viewed as alternatives to one another, but as the opposite sides on the same reality-virtual continuum (Skarbez, Smith & Whitton, 2021). The real world is on the one side, with virtual reality on the other, and mixed reality in the middle of this continuum (Büth, Juraschek, Sangwan, Herrmann & Thiede, 2020; Savin-Baden, 2010). Virtual worlds are part of virtual reality. Virtual worlds are explained in this section, specifically the advantages and challenges of virtual worlds in the context of higher education learning facilitation. This discussion then tapers down to one specific virtual world, *Second Life*<sup>™</sup>. This specific virtual world is central in this study that explores how learning can be effectively facilitated in a *Second Life*<sup>™</sup> classroom at an African University.

#### **3.5.1 Exposé of virtual worlds**

Ip and Li (2022:293) define virtual worlds as “a computer-simulated representation of a world with specific spatial and physical characteristics, and users of virtual worlds interact with each other via representations of themselves called ‘avatars’”. Prinsloo (2018:46) adds that virtual worlds are “computer-moderated, persistent environments through and with which multiple individuals may interact simultaneously.” Servers, devices, the internet, software, humans as well as human interaction need to be present for virtual worlds to exist. Consequently, virtual worlds are more than code, but the conversion among the mentioned constituents within a larger contextual order (Illing, Gaspers & Schulz, 2021). Furthermore, virtual worlds are persistent and they do not have an end-time. This means that these worlds do not stop if the web-users leave the virtual words.

For as long as the servers are online, virtual worlds exist. This continuity distinguishes virtual worlds from smart gaming<sup>12</sup>. Examples of virtual worlds are displayed in a collage in Figure 3.4 below, namely *Active Worlds*<sup>TM</sup>; *Blue Mars*<sup>TM</sup>; *Dark Age of Camelot*<sup>TM</sup>; *Everquest*<sup>TM</sup>; *Hello Kitty Online*<sup>TM</sup>; *IMVU*<sup>TM</sup>; *Kaneva*<sup>TM</sup>; *Machinima*<sup>TM</sup>; *MUD-1*<sup>TM</sup>; *NeverWinter Nights*<sup>TM</sup>; *Project Wonderland*<sup>TM</sup>; *Reaction Grid*<sup>TM</sup>; *SimsOnline*<sup>TM</sup>; *There*<sup>TM</sup>; *Twinty*<sup>TM</sup>; *Ultima Online*<sup>TM</sup>; *Web.Alive*<sup>TM</sup>; *World of Warcraft*<sup>TM</sup>; and *Second Life*<sup>TM</sup> (Linden Lab, 2022; Prinsloo, 2018; Savin-Baden, 2010).



Figure 3.4 Collage of virtual worlds (Liebenberg, 2022; Linden Lab, 2022)

Voices like Rajguru, Obrist and Memoli (2020) confirm the interest of higher education institutions to integrate virtual worlds with their learning facilitation. They state that universities consider the options that virtual worlds present for learning facilitation as

<sup>12</sup> Smart games have the objectives of winning and defeating while learning, participating and interacting with others is the end in itself in virtual worlds.

limitless. Their belief accentuates the advantages that virtual worlds bring to higher education learning facilitation, as discussed in section 3.5.2. But there are also several cautions raised, like for example by Govindarajan and Srivastava (2020), on the implications of shifting to virtual world learning facilitation in higher education. They express the challenges that virtual worlds may bring to learning facilitation. In section 3.5.3, challenges and limitations of virtual worlds are explained.

### **3.5.2 Advantages for higher education learning facilitation in virtual worlds**

Palomba (2020) contemplates that virtual worlds provide students with the feeling of presence, and they experience these synchronous worlds as if they were tangible, real-world events. The embodied representation of students in virtual worlds creates the feeling of belonging in them, because they appear similar to the other avatar students (Rava, Ivanovs, Skadins & Nesenbergs, 2020). This has the effect that they usually associate with the other avatars, walk around and explore the environment as if it is a real university, and engage with the content. Deep immersion follows because of their engagement in the virtual world, which has the effect that students learn (Melchor-Couto & Balteiro, 2019). Within virtual worlds, students uncover artefacts, information, and locations. These actions drive creation and co-creation of knowledge, which positively induce learning (Mystakidis, et al., 2021).

Virtual worlds are regarded as rich contexts with interactive artefacts, and therefore give students a sense of immediacy and contextualised location. Within the higher education learning facilitation context, environments like archaeological digs can be constructed. In one study archaeology students could virtually scrutinise artefacts found in these archaeological dig sites (Taylor, Shikaislami, McNicholas, Taylor, Reed & Vlaev, 2020). In another study medical students were able to handle the emergencies encountered in medical wards (Swier & Peterson, 2018). Art students can engage in art exhibitions and poetry readings. Because of the novelty and creativity associated with virtual worlds, innovative behaviour is stimulated.

Virtual worlds also answer to the needs of Millennials and Generation Z in higher education, because they enable voicing, co-creation of content, the feeling of play, communities of practice and groups of inquiry in learning facilitation sessions (Price-Williams & Sasso, 2021). These worlds move the essence of higher education learning facilitation away from static spaces (Savin-Baden & Tombs, 2016), because they are universal, flexible, and not bounded by physical rules such as gravity, weather conditions, and time. Students and facilitators can be separated by geographical boundaries, time, and economies and still be in two spaces simultaneously. Students can meet facilitators, professionals, and subject experts from any national or international university inworld (Kacher, 2021). Real world delays, like visa application issues to travel to other countries, become irrelevant here. Therefore, students can visit the open spaces of other higher education institutions, their own institution, or engage in individual consultations with their facilitators inworld with ease.

Virtual worlds lessen feelings of loneliness and isolation, which are often associated with distance and online higher education (Knowles, Stelzer, Jovel & O'Connor, 2017). These worlds carry the aura to students that they are *alone together* (Irwin & Coutts, 2020). Communities in virtual worlds, reciprocal action amongst different cultures and their customary artefacts often lead students to acquire multicultural literacy. Constructive virtual acculturation and multicultural perspectives inworld could positively influence real world socialisation amongst cultures (Sibilla & Mancini, 2018).

Higher education learning facilitation in virtual worlds cuts down on cost in several ways. The cost of travel to face-to-face classrooms and the worktime lost is minimised if web-users log into virtual worlds for an hour from their offices to attend learning facilitation sessions. Relocation and residence expenditure become irrelevant (Bowman, Banks & Downs, 2021). The building costs of brick-and-mortar traditional classrooms at universities are significantly higher if compared to design costs for buildings in virtual worlds. This is also true for maintenance costs of actual classrooms and buildings compared to virtual worlds (Wheelock & Merrick, 2021).

Virtual worlds allow for universal access. Assistance is given to students in virtual worlds with hearing disabilities by means of additional auditory information (MacArthur, Grinberg, Harley & Hancock, 2021). Students with physical disabilities have the same opportunity as their able-bodied counterparts to equally join in virtual classroom learning activities. For those with learning difficulties, content can be divided into smaller chunks. These portions help them in their learning process, instead of being bombarded with large quantities of information at once - which often happens in face-to-face classes.

Virtual learning facilitation sessions assist with the safety of students compared to attendance at the physical higher education institutions. Students do not need to travel by night for evening learning facilitation sessions or enter dangerous parts of cities to attend classes. Students can interact without the fear of contracting viruses such as those from the Covid-19 pandemic (WHO, 2020) and the M-Pox outbreak (WHO, 2022). Students can continue their higher education learning facilitation sessions amidst raging wars, like the Russian invasion of Ukraine (Aljazeera, 2022).

### **3.5.3 Disadvantages for higher education learning facilitation in virtual worlds**

A challenge for higher education learning facilitation in virtual worlds is that the technology itself sometimes inhibits the capacity of students to concentrate on their inworld objectives and tasks (Acharya, 2022). It is called obtrusiveness and can be caused by, for example, a microphone that does not work effectively, or when an internet connection is interrupted. Technical requirements, device processing capabilities, unreliable technology, image resolution, communication hindrances, login problems, firewalls, complex avatar controls, interrupted electricity provision, downtime of virtual worlds, lags and bandwidth could challenge fluent virtual world access and functionality (Schwrin, 2021).

Some students complain that it takes time to acquire the skills to use avatars fluently, and to control their movements in virtual worlds (Swier & Peterson, 2018). Traditional classes are not just ported directly into the online settings of virtual worlds. Misconceptions also exist in terms of the labour, time-intensity and expertise required to optimise higher

education learning facilitation in virtual worlds (Rajguru, et al., 2020). For traditional facilitators to become competent with virtual world educational tools, avatars, artefacts, and learning pedagogies require a substantial amount of time. The learning curve to master learning facilitation skills for virtual worlds is considered steep, because communication, interaction and movement skills need to be acquired; and pedagogies adapted (Gregory & Wood, 2017). The already burdened schedules of academics, and the claiming of more time could become too much and influence them negatively towards higher education learning facilitation in virtual worlds.

The masked costs to virtual world higher education learning facilitation, such as the maintenance costs of these institutions, technological infrastructure expenditure, technical personnel salaries and learning facilitation remuneration are frequently disregarded. Furthermore, students must incur data costs and related expenditure on technology to access virtual worlds (Nunes, Herpich, Oliveira & Hannel, 2021).

Virtual worlds have the effect of consensual hallucination, which means the impression amongst web-users is that they are not accountable for what they do or say in these environments (Van Loon, Bailenson, Zaki, Bostick & Willer, 2018). It seems as if their words do not have actual repercussions. At times, avatars can behave capriciously towards other avatars, because they do not perceive them or their behaviour as real. Web-users can perceive themselves and others as untouchable in this domain. Furthermore, web-users often believe that they are relieved from ethical convictions in virtual worlds, namely of what is correct and what is not. Griefing is also present (Duquette, 2020), which means the disruptive behaviour to disturb the experiences of those present in these worlds. This could be a real challenge during learning facilitation if not contained. In section 5.10 these dangers are especially addressed, and a step-by-step guide created to assist participants during the empirical part of this study.

Identity is sometimes falsified in virtual worlds (Slater, Gonzalez-Liencre, Haggard, Vinkers, Gregory-Clarke, Jelley, Watson, Breen, Schwarz, Steptoe, Szostak, Halan, Fox & Silver, 2020) and anonymity of avatars can lead to credibility challenges. Innocenti,

Geronazzo, Vescovi, Nordahl, Serafin, Ludovico and Avanzini (2019) have remarked that web-users often distort information regarding their gender and age when inside virtual worlds. Furthermore, web-users can also, by means of using multiple avatars or IP addresses, hamper the estimation of their authenticity here. Prinsloo (2018) cautions that virtual worlds can blur life spheres, such as work and social environments, which can affect the private lives of students. It can profoundly invade them and addiction to these worlds may be a harsh consequence.

Virtual worlds were briefly described in this section. The next section will elaborate in detail on *Second Life*<sup>TM</sup>, the chosen virtual world for this study to explore the learning experience.

### **3.6 Higher education learning facilitation in *Second Life*<sup>TM</sup>**

*Second Life*<sup>TM</sup> is unpacked in this section in terms of its origins, a description of this specific virtual world, lessons learned from higher education learning facilitation in this world, the recognized benefits, and challenges, as well as considerations with the set-up of a *Second Life*<sup>TM</sup> higher education learning facilitation space.

#### **3.6.1 Origins of *Second Life*<sup>TM</sup>**

*Snow Crash* (Stephenson, 1992) is a cyberpunk novel of a virtual metaverse with avatar inhabitants who live there as if it is real. This novel initially led to the idea of *Second Life*<sup>TM</sup> (Eisenbrand & Peterson, 2020). Originally, the pioneering proposition of *Second Life*<sup>TM</sup> was to allow people to literally have a second life in a virtual environment where all web-users or avatars could connect in an online world that advances the human condition (*Second Life*<sup>TM</sup>, 2022). This virtual world was not developed to create a game with achievements and an end goal. The first version of *Second Life*<sup>TM</sup>, designed by the then 30-year-old Philip Rosedale of Linden Lab, was launched on 23 June 2003 (Linden Lab, 2022; Savin-Baden, 2010). A second version of *Second Life*<sup>TM</sup>, with more functionalities, was instituted in 2004. In March 2010, *Second Life*<sup>TM</sup> updated its viewer to Viewer 2, which enables alliances with other systems and their software (Linden Lab, 2022; Savin-Baden, 2010). Since then, the viewer is continuously updated.

Access to *Second Life*<sup>™</sup> is without a fee and possible by means of downloading the *Second Life*<sup>™</sup> viewer, which displays as an icon on a device when downloaded (Linden Lab, 2022). This online, three-dimensional virtual world enables customised web-user avatars to communicate, create and collaborate with one another, the artefacts, or this environment (Strickland & Pollette, 2021).

Active residents in *Second Life*<sup>™</sup> were about one million in 2010 but these numbers decreased to about half a million in 2018. Since 2018 a renewed interest in *Second Life*<sup>™</sup> is visible with about 350,000 new registrations per month (Buscemi, 2020). A markable increase to 35 million registered users in 2020 and 64.7 million in 2021 was observed, although not all these users remain active (Linden Lab, 2022). In terms of concurrent users, namely users logged into *Second Life*<sup>™</sup> at any given time, there was an initial hype, with a slope that followed. But a steady increase is visible since then. Figure 3.5 shows the concurrent users for 2009 and the fluctuation thereafter. The number of concurrent users rose to 66,000 for 2022 (Voyager, 2022).

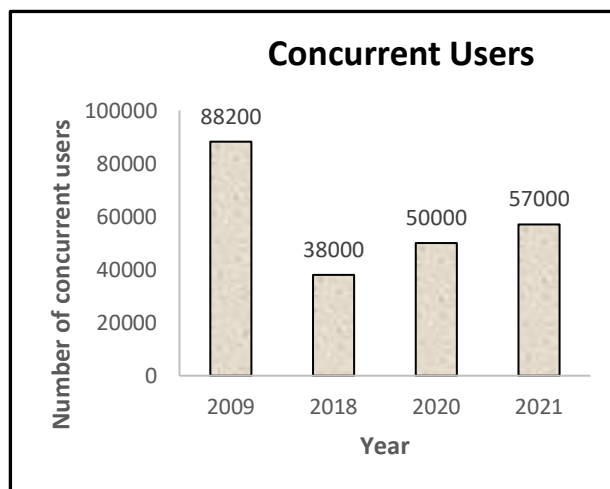


Figure 3.5: Concurrent users in *Second Life*<sup>™</sup> (Linden Lab, 2022; Voyager, 2021)

*Second Life*<sup>™</sup> has its own financial system (Savin-Baden, 2010) in the cryptocurrency of Linden Dollars (Linden Lab, 2020). One US Dollar equalled 320 Linden Dollars in 2022 and one South African Rand equalled 21.28 Linden Dollars in the same year (ExchangeRate, 2022). Financial transactions in *Second Life*<sup>™</sup> take place in Linden Dollars, but if the gross domestic product (GDP) in *Second Life*<sup>™</sup> during 2021 is converted to US Dollars; the GDP was

about \$567 million (Pey, 2021). This GDP exceeded the GDP of Austria (\$481 million), Nigeria (\$480 million) and Israel (\$467 million) for 2021 (TradingPost, 2022).

Despite an initial hype and anti-hype, *Second Life*<sup>TM</sup> gradually returned in terms of its use at higher education institutions. Steady growth and a renewed interest in *Second Life*<sup>TM</sup> occurred with the Covid-19 pandemic coupled with the current enthusiasm surrounding the metaverse (Chow, 2021). The number of higher education institutions active in *Second Life*<sup>TM</sup> from 2008 to 2022, as given in Table 3.4, mirror the fluctuating interest in *Second Life*<sup>TM</sup> as higher education learning facilitation space globally.

**Table 3.4: Number of active higher education institutions in *Second Life*<sup>TM</sup> (Linden Lab, 2022)**

Year	Number of active higher education institutions in <i>Second Life</i> <sup>TM</sup> globally
2008	200
2010	250
2012	190
2017	148
2021	152
2022	164

The decline of active higher education institutions in *Second Life*<sup>TM</sup> may be due to Linden Lab discontinuing its discounted rates of less 50% for land acquisition or rental for educational and non-profit groups in 2011 (Au, 2015). Higher education institutions and facilitators then sought cost substitutes. Gregory and Wood questioned the number of under-exploited classrooms in *Second Life*<sup>TM</sup> with: “What has become of the islands which have been reduced to virtual dust when their rent has lapsed?” (2017:3). Linden Lab overturned their suspension of reduced tariffs in 2013 and the discounted rates again applied for educational and non-profit groups since then. To some extent, this counteracted the reaction to the price increases, but many higher education institutions had already exited *Second Life*<sup>TM</sup> and were vested in alternative options (Silavong, 2021). Linden Lab has increased efforts to regain interest in educational activities in *Second Life*<sup>TM</sup>, such as adding a specially allocated *Second Life*<sup>TM</sup> in Education sub-domain. This area consists of resource material and explains higher education learning facilitation in *Second Life*<sup>TM</sup>. Furthermore, support services directories to learning facilitators were also included by means of *Second Life*<sup>TM</sup> for Educators (Linden Lab, 2020). The 15<sup>th</sup> Annual Virtual Worlds Best Practices in Education Conference was also hosted at the start of

2022 from within *Second Life*<sup>TM</sup>. All these efforts are bearing fruit with a regained interest in higher education learning facilitation in *Second Life*<sup>TM</sup>.

Despite the worldwide involvement of universities in learning facilitation within *Second Life*<sup>TM</sup>, no African university is institutionally active here. A void exists, because it is not possible to obtain any degree from an African higher education institution in *Second Life*<sup>TM</sup>.

### **3.6.2 Overview of *Second Life*<sup>TM</sup>**

*Second Life*<sup>TM</sup> is a three-dimensional, spatially organised virtual world (Garofalo, 2021). Access to *Second Life*<sup>TM</sup> requires a device, an internet connection, and data. There are no additional costs, such as subscription and registration fees to enter. The software to engage in *Second Life*<sup>TM</sup> and the *Second Life*<sup>TM</sup> viewer for Windows and mobile applications can be downloaded without licencing cost (Linden Lab, 2022). When registering as a *Second Life*<sup>TM</sup> student at a higher education, expenses are the study fees charged by the higher education institution where the student avatar is enrolled, and the data costs associated with the learning facilitation. While an advanced graphics card and plenty of RAM are always ideal, students with restrained budgets can access *Second Life*<sup>TM</sup> because this virtual world demands relatively little of device systems (Garofalo, 2021). However, dedicated technical support does involve costs for the higher education institutions hosting classes inworld (Smithson & Colgan, 2020).

Linden Scripting Language (LSL), which is similar to C programming, is used for coding in *Second Life*<sup>TM</sup> (Linden Lab, 2022; Programiz, 2022). Programming implies coding law, but there are also pertinent legal questions pertaining to *Second Life*<sup>TM</sup>. Questions are asked about the legal system under which *Second Life*<sup>TM</sup> resorts. Furthermore, if there are legal charges against *Second Life*<sup>TM</sup>, are they pressed under the US legal system because of the physical address of Linden Lab? Additionally, the dilemma exists what would happen if terrorist factions disseminated their doctrine in *Second Life*<sup>TM</sup>. Will the United States, North Atlantic Treaty Organisation (NATO) and the European Union intervene? In terms of individuals rights, *Second Life*<sup>TM</sup> further opposes the infringement

of individual rights, such as intolerance, assault, disclosure of personal information, indecency, harassment, or the disturbance of peace (Savin-Baden, 2010). In South Africa the Protection of Personal Information Act needs to be considered (POPIA, 2021). Copyright of basic avatars and artefacts are vested in *Second Life*<sup>TM</sup>. Once an avatar or artefact is modified and re-designed, the copyright of that avatar is then transferred from *Second Life*<sup>TM</sup> to the creator of the avatar. Clothing designed for the avatar can be sold in *Second Life*<sup>TM</sup> to other avatars. The same applies to artefacts or specific gestures (Second Life Community, 2022).

*Second Life*<sup>TM</sup> consists of islands of virtual land, encircled by virtual water (Zaušková & Alföldiová, 2018). Figure 3.6 presents a snapshot map of the islands in *Second Life*<sup>TM</sup> if viewed from above. Islands are located in *Second Life*<sup>TM</sup> regions, which are named after platinum group metals, namely Iridium, Osmium, Palladium, Platinum, Rhodium and



Figure 3.6: Islands in *Second Life*<sup>TM</sup> (Linden Lab, 2022)

Ruthenium. They are accessible by means of inworld landmarks or web addresses, called SLURLs<sup>13</sup> (Linden, 2022). Landmarks and islands in *Second Life*<sup>TM</sup> are modelled on the real world, or products of imagination.

Virtual replicas of real-world places include Trinity College and Knightsbridge in Dublin, St. Louis Island, the pyramids of Egypt, and the Eiffel Tower in Paris. The University of Delaware chose a hybrid model where their *Second Life*<sup>TM</sup> library, stadium and art gallery resemble real life, but their marine biology classes under the ocean are novel.

Higher education institutions can choose to set up replicas, imaginative or hybrid representations of their campuses in *Second Life*<sup>TM</sup>. There are advantages and disadvantages to each set up choice. When higher education institutions enter *Second*

<sup>13</sup> When a web page link opens in a web browser, it is called a URL. When a web page link opens in a viewer, it is called a SLURL; as is the case with *Second Life*<sup>TM</sup> (Urriah, 2019).

*Life*<sup>TM</sup> as an impersonation of their actual reality, students can easily identify and associate with the higher education institutions. The edifice of the university, the learning facilitation venues and syllabus are instantly identifiable (San Diego Business Journal, 2021). On the other hand, innovative learning facilitation spaces capture the imagination of students, increase their engagement and better their learning. Regardless of the set-up choice of learning facilitation venues in *Second Life*<sup>TM</sup>, there are design costs involved that need to be kept in mind. Buildings, either replicas or imaginative, need to be designed and constructed on the land parcels on the *Second Life*<sup>TM</sup> islands. Because there are no destructive weather conditions in *Second Life*<sup>TM</sup>, buildings do not necessarily need roofs. And because there is no gravity, no pillars are needed when roofs are designed to keep roofs intact.

What is further clear, is that there is no comparison when the cost of land as well as construction and maintenance of higher education learning facilitation venues in *Second Life*<sup>TM</sup> is compared to real life costs<sup>14</sup>. Additional costs to be factored in, are expenses for the interior design of learning facilitation venues, development costs of facilitation syllabi specific to *Second Life*<sup>TM</sup> learning, additional human resource remuneration and system integration charges for integration with the backend production information systems of the institutions (McKenna, 2021). Set-up costs of *Second Life*<sup>TM</sup> are lessened, considering that higher education institutions already have hardware and server infrastructure in place (Linden Lab, 2022).

They also already have learning facilitation spaces in place - which are usually traditional classrooms. But Franks (2020) notes how *Second Life*<sup>TM</sup> presents a plethora of spaces to enrich learning, playing and work. The imaginative nature of *Second Life*<sup>TM</sup> opens unlimited possibilities to create original, new realities. Higher education institutions can use a pantomime of fantasy and architectural imperatives beyond imagination as part of

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<sup>14</sup> To buy regions in *Second Life*<sup>TM</sup> costs \$349 for a full region of 65,536 m<sup>2</sup>, with a monthly maintenance fee of \$229 (Linden Lab, 2022). A discount of 50% applies to educational islands. The implication is that the buying of land for a full region for a higher education institution equals \$174.50 for 65,536 m<sup>2</sup>, with a monthly maintenance fee of \$114.50. If these amounts are converted for South Africa to South African Rand, it implies that the cost of land of 65,536 m<sup>2</sup> for higher education institutions is R2,932.22 with a monthly maintenance fee of R1,924.01 (Currency Converter, 2022). The University of the Free State's land and buildings are valued at R1,387,204,000 (UFS Annual Report, 2020). No maintenance costs are added to this valuation.

their learning facilitation spaces (Dokuchic, 2020). These spaces can be open fields, forests, or seashores, with different kinds of seating, or no seats at all. If a difficult task needs to be completed by students, but it is set against the background of a beach, the perceived tranquillity could enhance the problem-solving abilities of the students (Savin-Baden, 2010). Students can undertake virtual field trips to the Sistine Chapel, for example. They can gain experiences and information inworld without the necessity to travel, with its associated expenses. There are facilitators in *Second Life*<sup>TM</sup> who have difficulty with the novel pedagogical possibilities offered in *Second Life*<sup>TM</sup> based on their previous pedagogical frame of reference (Franks, 2020). To guide inhabitants with travelling and to locate landmarks and people inworld, *Second Life*<sup>TM</sup> has a navigation system, a map directive, and a search function (Savin-Baden, 2010).

The main categories of activities happening in *Second Life*<sup>TM</sup>, are business (like the Adidas Group, Coke, Toyota, and Vodafone), real estate, entertainment (Disney and 20<sup>th</sup> Century Fox), social activities (restaurants, bars, and nightclubs) and educational (Linden Lab, 2022). Most of the shading, lightning, and artefacts<sup>15</sup> in *Second Life*<sup>TM</sup> are produced by its netizens<sup>16</sup> and not by Linden Lab. Therefore, *Second Life*<sup>TM</sup> is described as user-driven, and this encounter ultimately becomes what the web-users want it to become (Cross, 2018). These web-users are called avatars. The Gartner Glossary (2022) defines avatars as computer representations of web-users in computer-generated 3D worlds. Avatars are the graphic identities that web-users elect to depict themselves in *Second Life*<sup>TM</sup>. They are custom-designed to create unique appearances for the virtual bodies of web-users and specific avatars can be chosen from an existing databank of basic avatars. As they start engaging in *Second Life*<sup>TM</sup>, avatars can devise new, or alter their present, appearance (University of Twente, 2022). Avatars are also available in the form of animals, aliens, bizarre or cartoon-type figurines. The most chosen type of avatars is humanoid (Kinder, 2022). If a human avatar is chosen, then the web-user can attribute any age, ethnicity, or gender to the avatar.

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<sup>15</sup> Artefacts are often the products of redesigned prims. Prims, or primitives, are shapes in *Second Life*<sup>TM</sup> which can be combined to create and design artefacts or transformed objects of the avatar's choice (Pixar, 2021). Islands in *Second Life*<sup>TM</sup> have limitations on the number of prims simultaneously allowed. Therefore, prims are selectively released and only activated as needed.

<sup>16</sup> Netizens are called citizens in the real world.

When web-users first create their avatars, they commence with basic avatars who may choose clothing from a limited selection of free clothing. Basic avatars can be modified to become unique inworld (Linden Lab, 2022). Web-users have the capability to do almost anything they can think of with their cyberspace representation. They can alter the garments, features, hair colour, clothing, or size of their avatars, but they must pay for accessories that are not part of the basic clothing range. Customisation usually leads to the strong identification of web-users with their avatars. It is often seen that web-users want avatars to look like them (Gonzalez-Franco, Bellido, Blom & Slater, 2016). The initial request by almost all web-users is if, and how, they can alter and customise the look of their avatar. The customisation of an avatar is so powerful that the inability thereto, could become counter-productive to their existence and learning in *Second Life*<sup>TM</sup> (Koh, 2020).

Web-users can see their avatars and those of others on their devices in real time (Rodríguez & Greene, 2022). The identification of avatars, by their distinct names and surnames, appear in small dialog boxes just above the heads of avatars (Friehs, Dechant, Schäfer & Mandryk, 2022). Avatars can interact with one another from anywhere on earth. They can talk to other avatars, text, voice chat or send notecards<sup>17</sup> to them. They can engage in discussions, journeys, or social events (Second Life Community, 2022). Avatars can fly, teleport, walk, stroll, run, dance, do cartwheels or drive virtual automobiles when they want to move from one point to another in *Second Life*<sup>TM</sup>. They can move backward and forward, up, and down, from left to right and right to left, glance upwards and downwards and move from side to side (Gregory & Wood, 2017). There are only a minimal number of restrictions in the movement ability of avatars, such as the inability to move their limbs. Because the virtual legs of avatars do not get weary, they do not require chairs to sit during learning facilitation. Avatars can experience, for example, the inside of a tsunami without being exposed to any life-threatening situation, because they are immortal.

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<sup>17</sup> Notecards are inworld written messages that remain stored in the inventory of the receiving avatar, recording the date and time of sending and the avatar that created it (Rudolphi-Solero, Jimenez-Zayas, Lorenzo-Alvarez, Pinos, Ruiz-Gomez & Sendra-Portero, 2021)

Avatars are equipped with camera controls as navigation means. The camera controls become their eyes to view the immersive environment and give them the ability to obtain a 360-degree view. The point-of-view (POV) may be set to a first-person angle, where an avatar then moves around an object to view it from all angles and perspectives. Or the point-of-view can be from a third person, whereby avatars are also able to see themselves within *Second Life*<sup>TM</sup> (Kljajevic, 2021). Because avatars are operating behind their personas, it often decreases self-consciousness and can increase social interactivity among web-users (Pimentel & Kalyanaraman, 2020). Avatars<sup>18</sup> diverge from social media profiles, where web-users share content with the public via social media platforms (Hudson, Voytecki & Guili, 2018). All of these have implications for higher education learning facilitation in *Second Life*<sup>TM</sup>.

### 3.6.3 Lessons from higher education learning facilitation in *Second Life*<sup>TM</sup>

Lessons were learned in this study from research on higher education learning facilitation in *Second Life*<sup>TM</sup> in a variety of subject domains, such as medicine, nursing, psychology, language and literary studies, the arts, archaeology, religious studies, and tourism. The above-mentioned subject domains were deconstructed in this study. Lessons learned from them were used to explore the students' learning experience at an African university through the creation of a small-scale project of learning facilitation in *Second Life*<sup>TM</sup>, as expressed in the third research objective of this study.

Rudolphi-Solero, Jimenez-Zayas, Lorenzo-Alvarez, Domínguez-Pinos, Ruiz-Gomez and Sendra-Portero (2021) investigated learning facilitation in radiology within *Second Life*<sup>TM</sup> at the University of Malaga in Spain. The island of this university is displayed with its esplanade (number 1 in Figure 3.7); buildings (numbers 2 and 4 in Figure 3.7); conference

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<sup>18</sup> The difference between avatars and bots is that avatars are virtual personas who are controlled by humans. Bot is an abbreviation for robot and implies software that controls the simulated characters (HyperspaceAcademy, 2022). Avatars and agents differ because agents are managed by computer algorithms. Avatars, agents, and bots do not need to sleep, have no salary implications, do not bring labour issues, and do not become fatigued or annoyed. However, Rönnerberg (2020) indicates that avatars are more persuasive than agents are. This is because avatars are often considered as closer to humans because they are administered by humans. Agents, in contrast, are perceived as non-human and de-concretised. Both agents and avatars signify the presence of someone else, whether a computer or a human. Both represent humans to a lesser or a greater extent and display some form of a social presence.

centre (number 3 in Figure 3.7); the islet with small open-air auditorium (number 5 in Figure 3.7); and the floating auditorium (number 6 in Figure 3.7), where the learning facilitation took place. The performance and perception of third year radiology students at this university were viewed within *Second Life*<sup>™</sup>.



Figure 3.7: Aerial view of the island where the medical students received radiology learning facilitation (Rudolph-Solero, et al., 2021)

Students viewed this learning facilitation space positively, appreciated the informative content, the organised design, and the usefulness of the content in terms of their training in the field of radiology. They also applauded the unique insights that this way of learning brought. They liked the

element of fun associated with the learning facilitation. According to them, facilitation sessions were entertaining and exciting; and it motivated them to learn more. These students believed that the cooperative learning in *Second Life*<sup>™</sup> helped them learn better. Students liked the engagement, personalised learning environment and the instant feedback they received. They also appreciated the individual responsibility within a context of encouraged collaboration. The academic results post exposure to learning facilitation in *Second Life*<sup>™</sup> confirmed that learning occurred. Challenges mentioned by students were technical limitations to handle operations in *Second Life*<sup>™</sup> fluently and some found the subject content difficult. There were voices asking for assistance from the team to solve technical problems when experienced. Some students also were anxious about the time spent *playing* in *Second Life*<sup>™</sup> which created conflict with other academic tasks that had to be fulfilled. This anxiety may inhibit participation, collaboration and learning in *Second Life*<sup>™</sup>.

Sevda and Şeniz (2020) from Gazi University in Ankara in Turkey, focused on art and design, as well as art education in *Second Life*<sup>TM</sup>. Figure 3.8 shows the art works that the students created inworld as part of their learning. These students experienced the learning facilitation in *Second Life*<sup>TM</sup> as motivational and as a place where they can behave alike the real world but with the additional advantage that they were surrounded



Figure 3.8: Artworks created in *Second Life*<sup>TM</sup> (Sevda & Şeniz, 2020)

by advanced visuals and music. They liked the interaction, the global communities, and the creation of an alternative world.

Students mentioned that the three-dimensional design tools and scripts enabled them to express themselves as artists in *Second Life*<sup>TM</sup>. Their views coincide with Krueger's (2021) that *Second Life*<sup>TM</sup> offers a new perspective on art and presents new aesthetic options

for artists. Students also liked to view the representations of art and design in *Second Life*<sup>TM</sup>, as well as example works of artists during facilitation sessions. They affirmed that *Second Life*<sup>TM</sup> supports different ways of constructive learning. But Sevda and Şeniz (2020) cautioned that art education in *Second Life*<sup>TM</sup> is only possible if technological factors are considered carefully.

Yousif, Amani and Bamanger (2019) evaluated learning facilitation in *Second Life*<sup>TM</sup> to support English learning as a foreign language at the King Saud University in Riyadh, Saudi Arabia. Most students approved of the learning environment that brought collaborative learning, a relaxed space, the experience of new cultures and learning communities. They valued their engagement with students across the world and believed it increased their verbal language ability, as well as cultural awareness. Their exposure to native users of the target language helped them with authentic language formation and oral ability. In terms of performance of the students Yousif, et al. (2019) noticed better performance amongst students engaged in learning facilitation in *Second Life*<sup>TM</sup> to support the learning of English as a foreign language than those that did not. These research results coincide with a similar study by Oliver (2021) whereby peer-scaffolding supporting vocabulary and the correction of pronunciation is valued. Challenges arise in

facilitator training in pedagogies in *Second Life*<sup>TM</sup> if higher education learning facilitation in this domain is scattered and not institutionalised.

Al-Hatem, Masood and Al-Samarraie (2018) evaluated learning experiences in terms of family health, disaster preparedness and home safety in *Second Life*<sup>TM</sup> amongst nursing students from different higher education institutions in Malaysia. Most students said that learning facilitation in *Second Life*<sup>TM</sup> was less effective than onsite clinical experiences. Technological challenges were also expressed as hindering optimal learning facilitation inworld. Deep learning in *Second Life*<sup>TM</sup> was queried, which is in line with the questions of Irwin, Coutts and Graham (2019). These nursing students however did say that learning facilitation in *Second Life*<sup>TM</sup> was a good alternative if it was difficult to obtain clinical experience onsite. Their observation corresponds with the research of Foronda (2017) that *Second Life*<sup>TM</sup> does provide an alternative when public health nursing clinical settings are limited. The participants in this research of Foronda (2017) also preferred the onsite clinical settings for training. Some students complained that the scenarios presented to them inworld were not realistic enough. The learning curve to become eloquent in *Second Life*<sup>TM</sup> for facilitators and students, to a lesser extent, was mentioned. Nursing students indicated that learning facilitation in *Second Life*<sup>TM</sup> provides a safe environment where students can experiment on patients without risk of harming them. They also articulated that they could learn by correcting their mistakes in this domain and experience situations that they might not be able to encounter in their physical clinical settings. Student engagement and group work were viewed as benefits of learning facilitation in *Second Life*<sup>TM</sup>.

Just as with radiology students, Rudolphi-Solero, et al. (2021) also reported on the perceptions of medical students at the University of Málaga in Spain regarding higher education learning facilitation in *Second Life*<sup>TM</sup>. Medical students appreciated the costs of travel that became less if the learning facilitation took place in this domain. They also valued the collaboration with their peers and the interaction among students, and with their facilitators, in the learning facilitation sessions in *Second Life*<sup>TM</sup>. They perceived the experience as helpful, enriching, and useful, with the environment attractive, the course

content appropriate, and the facilitation as fun. They were willing to be part of further learning facilitation sessions in *Second Life*<sup>TM</sup>. The exterior and interior of these learning facilitation spaces are shown in Figure 3.9. The findings of Rudolphi-Solero, et al. (2021) correspond with a similar study by Lorenzo-Alvarez, Pavia-Molina and Sendra-Portero (2018). In this study, the medical students expressed that they felt more comfortable to ask questions and were less embarrassed to do so because of the layer of anonymity that *Second Life*<sup>TM</sup> brings. The web domain was experienced as simple to learn, because of the presentations, notecards and voice chats used during learning facilitation sessions. Performance, pre- and post-training tests were completed and a significant increase in the knowledge of the students in this study was seen from the test results. This example



Figure 3.9: Learning facilitation at the University of Málaga in Spain in *Second Life*<sup>TM</sup>. (Rudolphi-Solero, et al., 2021)



guided the researcher of this present study to also engage in pre- and post-facilitation tests to explore the learning experience in Africa (see

section 5.8.1). A lack of knowledge on how to create and manage avatars in *Second Life*<sup>TM</sup> was sometimes challenging to medical

students and the facilitators. They also mentioned connectivity issues and the importance of microphones that must work adequately for learning to take place.

Grieve (2017 in Mercer, 2020) evaluated learning facilitation in *Second Life*<sup>TM</sup> within religious studies among students at the University of North Carolina at Greensboro. During learning facilitation, students were part of *Second Life*<sup>TM</sup> meditation sessions within a Zen community. Their avatars rested on cushions while the web-users meditated in front of their device screens. The opinion of Grieve (2017 in Mercer, 2020) is that devices do make spirituality authentic and meaningful. They bring sophisticated religious spaces to those that take part in spiritual activities within *Second Life*<sup>TM</sup>. This study stated that novel rituals, such as meditation in *Second Life*<sup>TM</sup>, should not be outright rejected. By the same token, Falcone (2019) argued that sacrality in *Second Life*<sup>TM</sup> is just as

constructive and contingent as in the real world. He stated that the divinisation of humankind is expected in cyberspace where humans will soon be able to download themselves in virtual cyber heavens. Students that partook in learning facilitation in these religious contexts found *Second Life*<sup>TM</sup> more self-fulfilling than in the real world. Some students remarked that they would never have had the courage to walk into such a temple or read books about Buddhism without fear of family and friends. Both the researchers conclude that Buddhist life in *Second Life*<sup>TM</sup> is just as authentic as Buddhist practice in real life. Falcone (2019) stated that *Second Life*<sup>TM</sup> is not a mythological space, activated by imagination. He emphasised that it does not require a leap of faith to operate in this domain, but just the relevant technology.

Learning facilitation methods observed in these studies are mentioned in Table 3.5 and then deconstructed in terms of their use in *Second Life*<sup>TM</sup> learning facilitation sessions. The lessons learned from these studies assisted with the setting up of a small-scale learning facilitation project in Africa in response to the third research question: What is the learning experience of students in a *Second Life*<sup>TM</sup> classroom at an African University? The lessons learned were valuable when the learning facilitation methods in the empirical research of this study were chosen (see section 5.8.1), because they informed the choice of a variety of learning facilitation methods appealing to as many as possible of the senses of students and allowing for different learning styles of students.

**Table 3.5: Learning facilitation methods most suitable in *Second Life*<sup>TM</sup> (Abdullah, Mohd-Isa & Samsudin, M.A., 2019; Chen, et al., 2021; Jivram, Kavia, Poulton, Hernandez, Woodham & Poulton, 2021; Savin-Baden, 2010)**

Learning facilitation method	Use in <i>Second Life</i> <sup>TM</sup> learning facilitation	Lessons learned
Classroom facilitation	<ul style="list-style-type: none"> <li>• Stays and easy option for learning facilitation in <i>Second Life</i><sup>TM</sup>, because it is a known facilitation method.</li> <li>• Lecture capture systems may be used or live streaming of facilitation sessions.</li> </ul>	<ul style="list-style-type: none"> <li>• In <i>Second Life</i><sup>TM</sup>, classroom facilitation must occupy a small space of the whole facilitation context.</li> <li>• Presentations need to be short and not exceed 30 minutes.</li> <li>• Must be coupled with debates and discussions.</li> </ul>

Learning facilitation method	• Use in <i>Second Life</i> <sup>™</sup> learning facilitation	• Lessons learned
Seminars	<ul style="list-style-type: none"> <li>• It is an effective inworld learning facilitation method whereby academic debate is stimulated and students learn from the knowledge of other students.</li> </ul>	<ul style="list-style-type: none"> <li>• Seminars need to be followed by debates, identity reassignment activities and discussions during learning facilitation in <i>Second Life</i><sup>™</sup> to ensure maximum learning.</li> </ul>
Problem-based learning	<ul style="list-style-type: none"> <li>• It is a useful learning facilitation method, since it involves groups that are exposed to a problem and must construct new knowledge based on the problem scenario.</li> </ul>	<ul style="list-style-type: none"> <li>• This learning facilitation method is not driven by facilitator knowledge.</li> <li>• Flexible knowledge, collaboration skills and problem-solving skills are developed.</li> <li>• If problems are presented, the learning process is activated.</li> </ul>
Demonstrations	<ul style="list-style-type: none"> <li>• The purpose of demonstrations is to explain theoretical perspectives in a visually appealing format.</li> </ul>	<ul style="list-style-type: none"> <li>• Safe way to do scientific experiments.</li> <li>• Experiments and demonstrations can be repeated as many times as needed and without initial or additional costs.</li> <li>• Certain demonstrations or experiments would not be possible to execute in real life.</li> </ul>
Film and video streaming	<ul style="list-style-type: none"> <li>• This is increasingly possible during learning facilitation, because of the growth in video capturing and streaming options.</li> </ul>	<ul style="list-style-type: none"> <li>• To be used in learning facilitation to spark debate.</li> </ul>
Simulations	<ul style="list-style-type: none"> <li>• Reality is fully simulated in an immersed context.</li> <li>• Holodeck technology allows for scenes to be changed instantly within scenarios.</li> <li>• Simulations prepare health professionals for disasters, emergencies, pandemics, and bioterrorism.</li> </ul>	<ul style="list-style-type: none"> <li>• Students may be placed in contexts which are not always possible in real life, like being with a drug addict in a euphoric state.</li> <li>• Simulations can be repeated with little additional cost.</li> </ul>

Learning facilitation method	Use in <i>Second Life</i> <sup>TM</sup> learning facilitation	Lessons learned
Reassignment of digital identities	<ul style="list-style-type: none"> <li>• Web-users are requested to fulfil the role of other identities, perhaps of personas that they do not prefer.</li> <li>• They are often asked to be avatars of a certain race, age, gender, and physical ability to perceive their experiences.</li> </ul>	<ul style="list-style-type: none"> <li>• Keep the ethical implications in mind.</li> <li>• Challenges encountered with the reassignment of digital identities often change the perceptions of the web-users towards other personas.</li> <li>• During learning facilitation, ask web-users to keep record of their experiences.</li> </ul>
Re-playable podcasts	<ul style="list-style-type: none"> <li>• Podcasts and recorded debates are considered more effective for learning than static learning management systems.</li> </ul>	<ul style="list-style-type: none"> <li>• Make engaging to stimulate academic debate and engaged learning.</li> <li>• Otherwise, it is not highly recommended.</li> </ul>
Debates	<ul style="list-style-type: none"> <li>• Debates are very effective for engaged learning because learning is not vested in a facilitator inworld that stands in front of a class.</li> <li>• Debates by voice, notecards or text chat are all adequate and useful.</li> </ul>	<ul style="list-style-type: none"> <li>• Debates direct argumentation and guide students to scientifically converse and engage in academic critique.</li> <li>• Knowledge is created by discourse in communities.</li> <li>• Insights are created and reinforced by group work and teams, which aligns to social constructivism.</li> </ul>
Non-player character or chat bot interaction	<ul style="list-style-type: none"> <li>• Students interact with chat bots, although it usually remains on a basic level.</li> <li>• Chat bots act according to pre-decided roles.</li> </ul>	<ul style="list-style-type: none"> <li>• Pre-decided roles can be given to chat bots to assist within learning scenarios during learning facilitation.</li> <li>• Interaction with students can be pre-programmed and automated.</li> </ul>

The benefits and limitations of higher education learning facilitation in *Second Life*<sup>TM</sup> is considered hereafter before the chapter concludes with the creation of a guide, based on the literature review, on the setting up of higher education learning facilitation in *Second Life*<sup>TM</sup>.

### **3.6.4 Benefits of higher education learning facilitation in *Second Life*<sup>TM</sup>**

*Second Life*<sup>TM</sup> is much more than a playground for professors to experiment with learning facilitation (Teolis, Stephenson, Winkler & Barnes, 2018). This virtual world offers unlimited opportunities for learning and carries numerous elements of an ideal arena for learning facilitation to occur (Canto & Jauregi-Ondarra, 2021). Key principles for the use of technology in learning, that *Second Life*<sup>TM</sup> adheres to, are that this domain enables access, scalability, sharing, choice, continuous lifelong learning, and customisation. *Second Life*<sup>TM</sup> can also act as a reflector to evaluate and rethink practices within higher education learning facilitation (Savin-Baden, 2010). Specific benefits of higher education learning facilitation in *Second Life*<sup>TM</sup> are discussed below.

#### **3.6.4.1 Visual experience**

Television and an escalation in computer gaming led people to focus increasingly on the visual. Although the modern emphasis on the visual (Albó & Hernández-Leo, 2019) might not have directly contributed to the visual front end of *Second Life*<sup>TM</sup>, the use of visual effects in this domain is valued by students during learning facilitation. *Second Life*<sup>TM</sup> contains compelling visual experiences that address the needs of modern students. The visual appeal of this virtual world increases the engagement and interaction of students with subject content and information. This helps them to learn (Baron & Luz Celaya, 2022).

#### **3.6.4.2 Synchronous**

*Second Life*<sup>TM</sup> enables synchronous learning facilitation, which leads to a feeling of existence and immediacy. This contrasts with learning facilitation using learning management systems. The latter is static and lacking the human element (Cherniltsev & Yanina, 2019; Savin-Baden, 2010). Synchronous presence implies real-time communication between students and facilitators in *Second Life*<sup>TM</sup>. It also means consultation and supervision hours inworld, student meetings where students are together to debate topics, actual conferences, and field trips to any destination inworld (Jamison, 2017). Synchronous presence grounds learning environments and mediates immediate feedback from facilitators during learning facilitation. Students feel social and

psychological presence and being together, although alone. Non-verbal cues that are present, participation in real time, and Voice over Internet Protocol (VoIP) chats – all existing in the now - contribute to their feeling of embodiment. The connection of web-users and their bodies with devices, screens, headsets, and keypads also promotes embodiment, presence, and identity (Savin-Baden, 2010). The experience in *Second Life*<sup>™</sup> is visceral and engaged because avatars see their facilitators, peers, and themselves within the learning facilitation situation. The synchronous nature of *Second Life*<sup>™</sup> has a positive effect on learning (Kruk, 2021).

#### **3.6.4.3 Cost reduction**

Students and facilitators from higher education institutions may join *Second Life*<sup>™</sup> without cost. They do not have to buy land for learning facilitation sessions, because these costs are carried by the institution where they register as students or work as facilitators (Savin-Baden, 2010). Costs are cut when learning facilitation takes place in *Second Life*<sup>™</sup>, because there are no travelling costs involved to reach learning facilitation locations. In an era of diminishing funding for public higher education institutions (Walker, 2021), novel cost-saving avenues should be sought for learning facilitation. *Second Life*<sup>™</sup> precisely offers that, by means of low-capital expense operations and simulated experiences, which are often too costly to replicate in real life (Gent & Kainth, 2022).

#### **3.6.4.4 Openness**

Traditionally, students and facilitators had to be in the same geographic location for learning facilitation to occur, but this is not necessary anymore with *Second Life*<sup>™</sup> (Uzun, 2017). Facilitators, who are geospatially apart from students, can engage in proximity with students in this domain. For example, the avatars of health professional facilitators and medical students, who are geographically apart, could gather in virtual emergency rooms. Here they could converse in actual time and navigate through medical test results as a group. *Second Life*<sup>™</sup> offering learning facilitation to geographically remote students immeasurably open access to higher education learning facilitation (Sipos & Balen, 2017).

Furthermore, *Second Life*<sup>TM</sup> is more of an open space than real-life learning facilitation situations, because what students do when they work in groups is more visible to other students than it is in real-life. An example, mentioned by Savin-Baden (2010), was of students who were required to decide on any theme, like love or war. Then they had to build a tree, exemplifying the spirit of their theme, on an uninhabited island. While they were busy, the facilitator joined in and helped to build the tree. Because of the open space, students were able to follow what their group was doing, but also saw what was emerging from other students' projects. This is different from real-life group work, because of the openness of virtual worlds. This openness of *Second Life*<sup>TM</sup> is a characteristic of transformative learning (Girvan & Savage, 2019) where people mould one another extensively by means of critical reflection and centrality of experience. The perimeters of traditional higher education learning facilitation are disputed by this openness (Savin-Baden, 2010).

*Second Life*<sup>TM</sup> also adds a quality assured, alternative learning facilitation option for students who are off-campus, without them having to stand back for the experience of on-campus students (Savin-Baden, 2010). Boundaries between nationalities, backgrounds, countries, and cultures are also opened during the learning experience in *Second Life*<sup>TM</sup> (Rahman, Phon, Utama, Yahaya, Halim & Kasim, 2019).

#### **3.6.4.5 Communication, collaboration, and socialisation**

*Second Life*<sup>TM</sup> provides “opportunities for communication and collaboration that have a great potential” and increases the ability for “gestures, glances, facial expressions and movements necessary for the communication process” (Griol, Sanchis, Molina & Callejas, 2019:27-28). Extrapolation of ideas are encouraged, which culminate in subject integration during learning facilitation (Falcone, 2019). Social interaction, as well as frequent and real-time interaction between avatars and facilitators (Kyriltsias & Michael-Grigoriou, 2022), are stimulated. Communication, collaboration and socialisation become meaningful channels to learning. Animation and poses also contribute to rich non-verbal communication amongst avatars and facilitators. Non-verbal communication in *Second Life*<sup>TM</sup> plays a key role in resembling the experience of real life (Kruk, 2021). Just as in

traditional classrooms, avatars can raise their hands if they want to pose a question. Gestures assist avatars to display emotions and enable virtual engagement to be intuitive (Savin-Baden, 2010). Avatars can express encouragement by means of the clap of hands or facial expressions, show doubt, agreement, or ignorance (Photiadis & Papa, 2022).

The social presence of both facilitators and students is key in *Second Life*<sup>TM</sup> learning. This is not always possible at a real-world campus. Student engagement usually increases with collaborative opportunities, shared knowledge constitution and open routes to material during learning facilitation in *Second Life*<sup>TM</sup> (Bell, 2019). The escalated engagement often improves knowledge formation, internalisation of outcomes, and long-term memory retention (Nisiotis & Alboul, 2020). The avatar synergy during learning facilitation in *Second Life*<sup>TM</sup> may directly influence the way obstacles are dealt with in the outer world, positively or negatively (Chen, et al., 2021; Pereira, Artemiou, McGonigle, Conan, Sithole & Yvorchuk, 2018).

#### **3.6.4.6 Association with games**

Learning facilitation in *Second Life*<sup>TM</sup> is often associated with fun (Erturk & Sahin, 2019). Although *Second Life*<sup>TM</sup> is not a game, its play-like quality often facilitates the prompt transfer of skills, especially with the Millennials and Generation Z. The learning facilitation experience is therefore perceived as stimulating, because of the digital game experience (Ding, Chong & Yu, 2017) and motivates students towards learning in *Second Life*<sup>TM</sup> (Tinedi, Yohandri & Djamas, 2018).

#### **3.6.4.7 Innovative learning**

*Second Life*<sup>TM</sup> is a system of affordances and innovative learning (Savin-Baden, 2010). Learning that is enabled includes analysis, evaluation, critical thinking, creation (higher order thinking), as well as comprehension and remembering (lower order thinking) (Bloom, 1956; Persaud, 2021). Furthermore, students appreciate the deep scientific enquiry possibilities inworld (Teolis, et al., 2018). The physics of travelling objects could, for example, be explored and applied in this secure virtual environment (Pensieri & La Marca, 2019; Sanborn, Cole, Kennedy & Saewert, 2019).

#### **3.6.4.8 Co-construction**

Avatars create or co-engage in the building of artefacts during *Second Life*<sup>TM</sup> learning facilitation sessions. They can share or view their created artefacts (Amin & Ikhsan, 2021) and thus become creators of knowledge, which consequently leads to learning (Puthusseryppady, Emrich-Mills, Lowry, Patel & Hornberger, 2020). The learning process in *Second Life*<sup>TM</sup> is highly student-centred. Because of the mutual experience while co-constructing in a shared space, debate and discussion are stimulated. These lie at the heart of learning in *Second Life*<sup>TM</sup> (Rios, Loor, Villacis & Vazquez, 2021).

#### **3.6.4.9 Learning without real-life consequences**

Dwi and Jaslin (2021) indicate that the only limitations to *Second Life*<sup>TM</sup> higher education learning facilitation are the imagination and the availability of time to create these innovative ideas. *Second Life*<sup>TM</sup> provides a safe space wherein students can learn by experience and practice. Here, students can experiment with hypothetical scenarios where they can make incorrect decisions without the harsh consequences of the real world. This domain produces a space where students may fail safely; with anonymity (Savin-Baden, 2010). For example, students studying in criminal investigative subject fields can visit virtual crime scenes and simulate a sensitive investigation. Paramedics can attend to patients without the fear that the wrong procedure could lead to the death of their patients. Moreover, *Second Life*<sup>TM</sup> enables role-playing situations wherein zero defect is the norm, for example with pilots, doctors, nurses, and soldiers (Savin-Baden, 2010). Regarding applied epidemiology, the managing of infectious diseases can be facilitated and assessed within *Second Life*<sup>TM</sup>. This application of knowledge can have a significant influence in times when the world must deal with pandemics, such as Covid-19 (World Health Organisation, 2020).

#### **3.6.4.10 Resemblances with real-life**

It carries merit that *Second Life*<sup>TM</sup> does borrow from the assumptions of real-life and what is present in the real world (Eszteri & Mate, 2016). Actual world resemblances, equivalent types of artefacts, together with self-designed environments and self-determined scripts make the events in *Second Life*<sup>TM</sup> real (Koles & Nagy, 2021). Because of this real-world

metaphor, *Second Life*<sup>TM</sup> acts as a rich background to the avatars. The ability to touch artefacts leads avatars to perceive the virtual environment as realistic (Martins, Oliveira, & Amaro, 2022). Avatars often share their cultural artefacts in *Second Life*<sup>TM</sup>, which are linked to the ideologies of the students who create them. This brings the opportunity for the development of multiculturalism and intercultural awareness (Gregory & Wood, 2017). Multiculturalism shapes the exploration of differences among cultures and the sharing of narratives on cultural customs amongst avatars (Nelson, Black & Bamberry, 2021).

#### **3.6.4.11 Uplifting the marginalised**

In developing continents an additional benefit, compared to developed continents, accompanies higher education learning facilitation in *Second Life*<sup>TM</sup>. People from remote areas, or employees who do not have the opportunity to engage in traditional higher education learning facilitation systems, are able to attend learning facilitation inworld. Within *Second Life*<sup>TM</sup>, the marginalised is equal to everyone else. *Second Life*<sup>TM</sup> acts as a leveller and creates the foundation for equitable higher education learning facilitation interaction (Mitra & Golz, 2016). Professional development becomes possible for all because of participation in *Second Life*<sup>TM</sup>, learning how complex systems work, being part in making decisions, and taking part in discussions during learning facilitation. Therefore, *Second Life*<sup>TM</sup> learning facilitation uplifts the marginalised in developing continents (Ozonur, Sancar-Tokmak & Yanpar-Yelken, 2022).

#### **3.6.4.12 Interdisciplinary interaction**

Opportunities for interdisciplinary studies and knowledge sharing are ample in *Second Life*<sup>TM</sup>. Debates and academic conversations amongst avatars spur interdisciplinary cooperation. Interdisciplinary interaction is not always possible in an on-campus setting because a variety of students from different subject fields is not always geographically together. Students in *Second Life*<sup>TM</sup> can easily interact with students from other fields of study, because of the smoothness of proximity to other avatars (Omar, Drewsh & Ahmed, 2018).

### 3.6.4.13 Enabling students with disabilities

It is beneficial for shy students to be somewhat removed from their real identity when they are represented by their avatars. It is less stressful for these students and those with mental or learning disabilities to operate at the backend of an avatar. This could decrease their unease to talk or appear in public and eventually enhance their learning experience (Denis-Rémis & Heully, 2020). Their intellectual risk-taking and freedom of expression can increase because learning facilitation in *Second Life*<sup>TM</sup> might not be as hostile as actual life. This statement is just as applicable to students with physical disabilities. This domain brings significant emotional and social gains for students with physical disabilities because of equality in movement ability. Students with leg amputations and lower body paralysis could engage with ease in *Second Life*<sup>TM</sup> and act on an equal basis with other web-users during learning facilitation. Furthermore, assistive technology is available to aid those with hearing and vision impairments to partake in the learning facilitation in *Second Life*<sup>TM</sup>.

Alternative keyboard and input devices, eye gaze detection, and voice-to-text software ease usability. Transcribers can also provide text on learning facilitation sessions, which can be read to students who are blind or dyslexic. Students with hearing impairments, or those who are deaf, would experience problems when voice communication serves as the main form of learning facilitation. Software exists that mechanically changes spoken language into sign language by means of speech recognition. It needs to be noted that the sign language used in the United States of America differs a little bit from the sign language used in South Africa.

Haptic devices are used to assist web-users who are visually impaired or blind. Guardians, coaches, and mentors can accompany those with impaired intellectual capacity inworld (Barros, Brangman, Indelicato, Krueger, Ludwig, Slutzky, Stewart & Germain 2022). Participation in learning facilitation in *Second Life*<sup>TM</sup> helps to decrease the depression, loneliness, social isolation, and anxiety of students with mental illness (Savin-Baden, 2010). An additional benefit of *Second Life*<sup>TM</sup> is that people with real-life

neurological disabilities can socialise safely in this space. In many cases, this is not possible in the actual world (Linden Lab, 2022).

#### **3.6.4.14 Self-awareness**

Students experience learning facilitation in *Second Life*<sup>TM</sup> through the eyes of their avatars and are not observers from a distance. This first-person immersion is personal and creates the feeling of *being there*. The experience is similar to face-to-face conversations with peers and facilitators during learning facilitation (Gregory & Wood, 2017). Personal and self-awareness thus develop within student web-users as part of encounters in *Second Life*<sup>TM</sup>, especially because they are not third-party viewers. This has the effect that students then feel as if they belong in *Second Life*<sup>TM</sup> and are part of a social group (Kruk, 2021). *Second Life*<sup>TM</sup> hosts human agency and self-awareness in avatars because of their natural speech, non-verbal abilities, and emotive possibilities (Gadalla, Abosag & Keeling, 2016). The control that students in *Second Life*<sup>TM</sup> have in terms of their movements and where they go, builds self-determination and self-confidence in avatars. This opens avenues for risk-taking and learning. Empathy also flows from *Second Life*<sup>TM</sup> learning facilitation experiences because web-users become aware of, and can develop deep insight into, avatars from other cultures, races, or genders (Gregory & Wood, 2017). The development of self-awareness and empathy in developing continents with oppressive colonial histories is one of the critical graduate attributes. The role of *Second Life*<sup>TM</sup> learning facilitation in this regard is key for the African continent.

#### **3.6.4.15 Reflection**

*Second Life*<sup>TM</sup> offers the opportunity and tool to facilitators to mirror current learning facilitation customs, direction of higher education and habits in pedagogy. Moreover, the essence of *Second Life*<sup>TM</sup> raises questions on why, and how, facilitation is practiced. It queries why subjects are taught in certain ways, how facilitation can be revised and remodelled, and learning can be ameliorated. *Second Life*<sup>TM</sup> learning also disputes the power of institutions and their regulation of learning facilitation. In addition, questions are raised if facilitators and students need to behave the same, or different, in real life

compared to virtual spaces. For example, students can literally change their clothing, dance, or walk around while in a learning facilitation situation. However, may they come to class naked, or with their avatar presented as an animal, or displaying a weapon? (Savin-Baden, 2010). *Second Life*<sup>TM</sup> learning facilitation opens the avenue to debate the essence of pedagogy and higher education.

#### **3.6.4.16 Improved learning**

Student engagement and shared experiences are enhanced during learning facilitation in *Second Life*<sup>TM</sup> (Rios, et al., 2021). Challenging infotainment in this domain intrigues students, leading them to immerse, and eventually to learn. Immersion positively affects learning because of the multi-perspective viewpoint of avatars, the situated learning experience and consequent transfer of knowledge.

### **3.6.5 Limitations of higher education learning facilitation in *Second Life*<sup>TM</sup>**

Some researchers opine that imagination is the sole limitation for higher education learning facilitation in *Second Life*<sup>TM</sup> (Martins, et al., 2022). However, this is not true for all. There are researchers and learning facilitators that question the value of *Second Life*<sup>TM</sup> in higher education learning facilitation. They rank face-to-face learning facilitation in traditional classrooms as premium, and consequently, the acceptance of *Second Life*<sup>TM</sup> might be slow (Gregory & Wood, 2017). The limitations of *Second Life*<sup>TM</sup> are also considered thoroughly by researchers. A discussion of the limitations to higher education learning facilitation in *Second Life*<sup>TM</sup> follows hereafter.

#### **3.6.5.1 Steep learning curve for new avatars**

Newly introduced learning facilitators and student avatars (newbies) often complain about the steep learning curve required to acquire the necessary skills to function in *Second Life*<sup>TM</sup>. This accentuates the need for training in *Second Life*<sup>TM</sup> for novice learning facilitators and student avatars. Therefore, the individual orientation sessions for the facilitator, the students and ICT services were given priority in the empirical research of this study with the exploration of the learning experience in section 5.6.2. Uncertainty

about location and inventory viewing is minimised if proper training is provided. Although there are orientation signage and islands when avatars enter *Second Life*<sup>TM</sup>, teleporting and moving around from one island to the other still needs to be mastered. When students arrive at their location, avatars must be able to walk, sit, fast walk, stroll or fly. Navigation and avatar animation in *Second Life*<sup>TM</sup> requires a certain level of proficiency, which could be difficult and time-consuming to reach. It is also a tedious process for facilitators to become so fluent with avatar navigation, non-verbal communication, and animation that they can guide their students on how to do this.

Avatar animation skills are necessary to ensure effective non-verbal communication within *Second Life*<sup>TM</sup>. If avatar animation is not understood, non-verbal communication is perceived difficult. Moreover, limited knowledge on how to use gestures could hamper functionality in *Second Life*<sup>TM</sup> and increase frustration among avatars (Savin-Baden, 2010). If non-verbal communication is insufficient, then fluent communication could be compromised - which could negatively affect learning in *Second Life*<sup>TM</sup> (Duarte, 2016). Appropriate behaviour in *Second Life*<sup>TM</sup> is sometimes unclear and student avatars could be uncertain of how to behave inworld. They might not be familiar with the social norms, reputation and identity, gestures and language used in *Second Life*<sup>TM</sup> (Savin-Baden, 2010). The novelty, inworld operations and social intricacies of *Second Life*<sup>TM</sup> often distract students. Their focus is then diverted from the subject content knowledge and subject specific learning facilitation to the operational, social, and navigational (Berger, Jucker & Locher, 2016). Therefore, orientation (see section 5.6.2) plays such a crucial role in learning in *Second Life*<sup>TM</sup>.

### **3.6.5.2 Technical issues**

Network speed within institutions at African universities is sometimes a challenge. However, even if network speed is adequate, there could be internal bottlenecks within higher education organisations when *Second Life*<sup>TM</sup> becomes a built-in application in their internal network environments. Institutional server space can become clogged if students or prims are present in mass. Servers can become very slow, or server downtime can occur (Costello, Cremins, Ahmed, Alaniz, Alexandratos & Bryan, 2021). *Second Life*<sup>TM</sup>

does not perform well in terms of scalability (Sevda, 2020). Challenges, such as responsiveness lags or slowdowns in *Second Life*<sup>TM</sup>, often arise with large crowds of avatars or a high concentration of primitives in *Second Life*<sup>TM</sup> learning facilitation contexts. The involuntarily logging-off of avatars could also occur, especially when the full capacity of learning facilitation sessions is reached (Kruk, 2021). For this reason, the project in this study was of small-scale to mitigate this challenge within the empirical research environment (see section 5.4). This challenge also influenced the researcher to work in close cooperation with the ICT services (see section 5.4.3) and have technical ICT assistance available during all the *Second Life*<sup>TM</sup> learning facilitation sessions.

Sometimes the *Second Life*<sup>TM</sup> viewer, as user interface, is a barrier to avatars to reach full immersion. This viewer, as an additional layer of software before access is possible, can complicate fluent operation in *Second Life*<sup>TM</sup> (Jung, 2021). Further technical issues, such as permission and sound issues, system glitches, incorrect video loading, browser inadaptability, server crashes, slow devices, reboot necessity, re-installation fixes and technical design, are often experienced with higher education learning facilitation in *Second Life*<sup>TM</sup> (Carden, 2019; Savin-Baden, 2010). Issues with internet connections can distort audio or slow down operations in *Second Life*<sup>TM</sup>. Some users indicated that an echo problem occurred during voice conversations or that they had trouble with text conversations (Lindberg, 2019). Headsets and add-on technology, which should enhance fluency in *Second Life*<sup>TM</sup> learning facilitation, can have an inverse effect on learning in *Second Life*<sup>TM</sup> if used incorrectly. This can hinder deep learning to occur (Dolores, Salvador & Jan, 2016).

### **3.6.5.3 Institutional firewalls**

Information Communication and Technology (ICT) divisions at higher education institutions do not always allow the launching of the *Second Life*<sup>TM</sup> viewer on the devices they manage. This happens because of the security risk involved to open IP addresses on the firewalls of their infrastructure. The number of internet ports required to be open in the firewalls of an institution might pose a security risk to the online environment of higher education institutions. When VoIP tools, microphone ports, viewers and speaker ports

are utilised in *Second Life*<sup>TM</sup>, even more internet ports need to be opened by ICT services, which increase the security risk (Gregory & Wood, 2017). Strong firewalls, which are paramount with increasing cyber-attacks and hacking, and proxy settings often contribute to access challenges. Some universities totally block access to *Second Life*<sup>TM</sup> (Karema, 2020). In addition, challenges are reported by the Information Communication and Technology divisions of higher education institutions regarding the complexity to open IP addresses for all devices used by students to access *Second Life*<sup>TM</sup> (Savin-Baden, 2010; Sullivan, Goetz, Gibson, Mayo, Washburn, Lee, Ptomey & Donnelly, 2016). The challenges intensify with inadequate institutional support, albeit technical or pedagogical (Gregory & Wood, 2017).

#### **3.6.5.4 Inadequate support and introduction**

The priority of higher education institutions remains on learning management systems, showing in the large financial outlays still being made to familiarise facilitators and support staff in terms of these learning platforms (Reid, 2019). Learning designers are appointed and are at hand to help facilitators or staff at tertiary institutions to manage these systems. This is usually not the case when *Second Life*<sup>TM</sup> is phased into higher education institutions. The absence of trained personnel in *Second Life*<sup>TM</sup> to assist and train learning facilitators can hamper the uptake of learning facilitation in this domain (Karema, 2020; Maciejewski, 2020). If learning facilitators or students are not properly introduced to the potential benefits and pedagogical affordances it could negatively affect their attitude towards learning facilitation in *Second Life*<sup>TM</sup> (Barros, et al., 2022). Furthermore, many information technology officials do not know of, or see the value of, learning facilitation in *Second Life*<sup>TM</sup>. This was also the case during the empirical research in this study and therefore the orientation of even ICT was regarded so important (see section 5.6.2). Ignorance in technology divisions that usually are well versed in technological advancements; can lead to resistance towards higher education learning facilitation in *Second Life*<sup>TM</sup>.

### 3.6.5.5 Resource intensive

*Second Life*<sup>TM</sup> is resource intensive, because it needs ample time from facilitators and students to ascertain how to operate, facilitate and learn inworld. Furthermore, adequate expertise for *Second Life*<sup>TM</sup> development and the configuration of software (as proprietary entity with plug-in requirements) together with human resources with support skills are needed. Financial resources for the affordance of creation, maintenance, and continuation of learning facilitation in *Second Life*<sup>TM</sup> is required (Sharma & Nazir, 2018). The planning and development of learning facilitation content for *Second Life*<sup>TM</sup> is highly time-consuming. The way in which subject specific content is presented inworld, differs from how this content is presented traditionally during face-to-face learning facilitation sessions. Added to this, it is time-consuming for learning facilitators to generate avatars and appropriate their appearance, script the context, and set-up the virtual learning facilitation settings. Learning facilitators also need to be aware of the time it takes students to partake in inworld higher education. Learning facilitation in *Second Life*<sup>TM</sup> falls in the domain of mostly uncharted territory for most facilitators. Because virtual world facilitation is innovative and often happens instinctively, there are not always design examples or templates available to be used (Savin-Baden, 2010).

### 3.6.5.6 Not easy to use

Gregory and Wood (2017) sceptically rank learning facilitation in *Second Life*<sup>TM</sup> in terms of ease-of-use, group enjoyment and usefulness. Unfavourable comments are also made about locating other avatars if avatars are searching for a specific student or avatar inworld. To operate in *Second Life*<sup>TM</sup> often leads to feelings of being disorientated; uncertainty where to go; and being unclear on who is speaking if there are several avatars around. Criticism has also been raised about the time it takes inworld to locate artefacts, objects, and animations as it requires sophisticated searching skills (Gadalla, et al., 2016). Sometimes it is difficult to locate a specific island in *Second Life*<sup>TM</sup> and students can get lost (Gayathri & Neelananarayanan, 2019). This could be due to the missing sense of urbanism in *Second Life*<sup>TM</sup>. The geographical layout is often perceived as lacking master planning and as an *ad libitum* domestication in a virtual arena (Sevda & Şeniz, 2020). Moreover, as with almost all software applications in higher education learning

facilitation, the question arises if *Second Life*<sup>TM</sup> is user-friendly and easy to use for web-users with disabilities, the elderly, or those with special conditions and challenges (Zelić & Felić, 2020). However, mitigation of this risk is discussed in section 3.6.4.13, explaining the aid that exists inworld.

Students of higher education institutions in *Second Life*<sup>TM</sup> must register, just as in the case with real-world higher institutions. To register at a higher education institution in *Second Life*<sup>TM</sup> could be difficult. Thereafter, to access as a registered student, download an avatar, and locate the tertiary institution in this domain may be complex for newbies. This might be confusing for students and university staff. Linden Lab created a Registration Assisted Programming Interface (Reg API) to address this challenge (Linden Lab, 2022). The mere fact of being in *Second Life*<sup>TM</sup> can distract students and indirectly interfere with their learning. The reason is that students may have trouble concentrating on learning objectives and activities because of unforeseen distractions, such as the functionality, supplementary context information and activities inworld.

### **3.6.5.7 Access challenges**

The question arises if students, who stand to benefit from higher education learning facilitation in *Second Life*<sup>TM</sup>, have the required devices and adequate bandwidth for access (Pey, 2020). It is not always possible for all students to have a personal device with all the requested capabilities to participate in learning facilitation sessions in *Second Life*<sup>TM</sup>. Broadband access with adequate network speed, graphical capability, and sufficient Random Access Memory (RAM) are required (Wardle, 2022). Furthermore, people with disabilities have additional access challenges, since they need assistance by means of large screens, special joysticks, voice navigation, motion-sensitive controllers, and eye-tracking management to keep up with their peers during learning facilitation in *Second Life*<sup>TM</sup>. It is important that research on the limitations experienced by students with physical and mental challenges in *Second Life*<sup>TM</sup> during learning facilitation is increased (Yu, et al., 2017).

### 3.6.5.8 Digital divide hindrances

The digital divide might negatively affect fluent functioning during learning facilitation in *Second Life*<sup>TM</sup>. For digital strangers and digital immigrants, it requires concerted efforts from their side to operate, learn and facilitate in *Second Life*<sup>TM</sup> (Gazave & Hatcher, 2017). On one hand, digital immigrant facilitators can be hesitant to engage in *Second Life*<sup>TM</sup> with digital native student avatars, because of a lack of confidence. They often believe that they are not able to effectively use technology for learning facilitation (Garcia & Da Silva, 2018). On the other hand, digital natives complain that learning facilitation in *Second Life*<sup>TM</sup> is not as exciting as gaming. Student web-users, who are accustomed to online games, could be frazzled by the graphics of *Second Life*<sup>TM</sup> or its relative void in comparison to high-speed animated web-based games (Duarte, 2016). A student commented that he did not enjoy using *Second Life*<sup>TM</sup>. He said it was interesting because of its novelty but believed that any game or science application would have done the same (Lee, 2021).

### 3.6.5.9 Age-appropriate content

*Second Life*<sup>TM</sup> is aimed at adults, which allows for the surfacing of the worst from within society. Age-inappropriate content frequently appears within *Second Life*<sup>TM</sup> and mature content is readily available, although often concentrated in certain regions in *Second Life*<sup>TM</sup>. This is of concern, especially if this content also emerges during learning facilitation sessions inworld or surrounds the educational environment. Ethical considerations do arise if situations occur where students might be exposed to dark virtual encounters in *Second Life*<sup>TM</sup>, even if they happen inadvertently. The dangers of pornography, nudity, adult theme clothing, sex simulations, crime, fraud, and drugs in *Second Life*<sup>TM</sup> are real (Gregory & Wood, 2017). Furthermore, the appearance of avatars can be offensive, or they can behave outside societal appropriate norms in a *Second Life*<sup>TM</sup> learning facilitation setting (Sancar-Tokmak & Dogusoy, 2020). There is also a looming danger of possible harassment inworld, by becoming part of sexually suggestive behaviour or exposed to avatars in the nude (Chen, et al., 2021). This unease is countered by Linden Lab with an age restriction of 18 years required for entrance to *Second Life*<sup>TM</sup>. Critics indicate that this argument does not hold water, because it is easy

for those younger than 18 years to register and gain access to *Second Life*<sup>TM</sup> (Happy, 2021). Because *Second Life*<sup>TM</sup> is frequently perceived as less real and anonymous, standards of behaviour are not always upheld in *Second Life*<sup>TM</sup>. Questions arise as to what degree the consequences of certain behaviour in *Second Life*<sup>TM</sup> should be the same as in the real world? (Kruk, 2021). Moreover, the anonymity of avatars could incline some web-users to be more openly aggressive in *Second Life*<sup>TM</sup> than in real-life.

Misbehaviour in learning facilitation sessions is often observed because students do not always abide by typical classroom behaviour when in *Second Life*<sup>TM</sup>. At times, artefacts in classrooms, which are not static, are re-arranged by student avatars (Erturk & Sahin, 2019). This also happened during the empirical research of this study when a griefer entered and moved artefacts around (see section 5.8). *Second Life*<sup>TM</sup> also carries the threat that web-users could duplicate stereotypes and biases, originating from the real world, into learning facilitation situations inworld (Martins, et al., 2022). Furthermore, grieving often occurs in *Second Life*<sup>TM</sup>. A griefer is defined as an avatar who causes distress to, or abuses, another avatar and “who deliberately irritates and harasses other” (Paez, 2020:1). Griefing also equates to vandalism, the destruction of artefacts and property, or the creation of repulsive construction in *Second Life*<sup>TM</sup>. Griefing<sup>19</sup> becomes *goon* if 3D graffiti is sprayed on the property of residents (Boellstorff, 2020). Continuous exposure to *Second Life*<sup>TM</sup> might also contribute to virtual world addiction.

#### **3.6.5.10 Integrity and authenticity**

Concern is expressed if identity can be verified and authenticity can be guaranteed in *Second Life*<sup>TM</sup>; meaning if student avatars are really operated by their said web-users (Voloj & Voloj, 2018). The authentic contribution by the avatar itself, when it comes to assignments and assessment, might not be easy to guarantee. However, the counterargument is also true, namely that when an assignment is submitted by a student in a traditional face-to-face class, there is no guarantee that the document was written by the specific student (Kruk, 2021). In *Second Life*<sup>TM</sup>, anyone can tell a lie. Students could

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<sup>19</sup> Hacking differs from grieving because hacking implies taking over of decision-making on an island in *Second Life*<sup>TM</sup>, while grieving is the deliberate harassment and irritation from another avatar.

also question the integrity of specific artefacts they have to study in *Second Life*<sup>TM</sup>. Although real web-users interact as avatars, the culture of *Second Life*<sup>TM</sup> is still an invented culture. Cues regarding the culture inworld are provided by fellow residents, information areas, avatar attendants and automated bots. Furthermore, within this ambient world, each island in *Second Life*<sup>TM</sup> often develops its own culture - which may require the student to make many behavioural adjustments together with the requirement of learning (Ozbek, Comoglu & Baran, 2017). Moreover, the disconnect between real-life synergy (human to human) and *Second Life*<sup>TM</sup> interaction (avatar to avatar) must be acknowledged (Savin-Baden, 2010). Questions are raised about identity formation in this world. Some web-users experience *Second Life*<sup>TM</sup> as superficial, infantile, surreal, or even self-inflated.

#### **3.6.5.11 Time zones**

Students attending *Second Life*<sup>TM</sup> learning facilitation sessions are usually scattered over the globe. Therefore, difficulties might arise with various time zones that need to be taken into consideration for the scheduling of classes. For all students and facilitators to be able to attend learning facilitation session at the same time, finding a convenient intersection of time for all globally requires careful planning. Inadequate management of time can hinder smooth learning facilitation processes and limit the learning affordances of higher education in *Second Life*<sup>TM</sup> (Dreyer, 2022).

#### **3.6.5.12 Intellectual property right and longevity**

The management of intellectual property right, copyright, student information protection, together with their legal implications in *Second Life*<sup>TM</sup>, could be challenging. *Second Life*<sup>TM</sup> tries to protect the rights of content builders inworld, but it is not always possible to guarantee this against hackers. The longevity of *Second Life*<sup>TM</sup> can also not be assured indefinitely. If the service provider, Linden Lab, closes its doors, then the existence of *Second Life*<sup>TM</sup> will be challenged. *Second Life*<sup>TM</sup> operates from the servers of Linden Lab in the United States of America. These servers reside outside sub-hosting institutions, such as the University of the Free State in South Africa. Thus, the stability of *Second Life*<sup>TM</sup> is not under the sole control of sub-hosting higher education institutions. Questions

are asked on what will happen with institutional data if a whole island is destroyed on the Linden Lab server or if all servers of Linden Lab are down (Gent & Kainth, 2022).

### **3.6.6 Considerations to set up a higher education learning facilitation space in *Second Life*<sup>TM</sup>**

Based on the origin and overview of *Second Life*<sup>TM</sup>, lessons learned from higher education learning facilitation inworld, as well as benefits and limitations of this domain for higher education learning facilitation, there are pertinent considerations to mull over when a higher education learning facilitation space is set up in *Second Life*<sup>TM</sup>. Based upon these considerations, guidelines are given below to inform the decisions to be made. A *Checklist for Course Creation in Second Life*<sup>TM</sup> was compiled by the researcher (see Table 3.6 in section 3.6.6.6) as well as a Table of Contents for a proposed *Orientation Manual* (see Figure 3.10 in section 3.6.6.10). These documents may be used by higher education institutions in Africa that want to set up higher education learning facilitation spaces in *Second Life*<sup>TM</sup>.

#### **3.6.6.1 Buy-in and approval of top management**

The buy-in of senior university management into operationalising *Second Life*<sup>TM</sup> as additional learning facilitation avenue within their university setting, is critical. To support the buy-in of top management, the submission of a strategy with an implementation plan on learning facilitation in *Second Life*<sup>TM</sup> for the specific university is key (Savin-Baden, 2010). Top management needs to endorse and support *Second Life*<sup>TM</sup> learning facilitation as part of their facilitation strategy. This will ensure the financial means for the ICT division to invest in the necessary infrastructure and to train staff on how to function in *Second Life*<sup>TM</sup> (Castañeda-Peña, Galeano, Barbosa-Chacón, 2018). It is important that the financial commitment of an institution exceeds the initial establishment and set-up costs of *Second Life*<sup>TM</sup> learning facilitation spaces. Additional funding needs to be available for maintenance and continual technical support after the commencement of learning facilitation sessions. Ongoing support is necessary to maintain, update and curate *Second Life*<sup>TM</sup> settings, together with support and assistance when difficulties arise during learning facilitation in *Second Life*<sup>TM</sup>. Commitment by the top management of higher education institutions is thus critical for learning facilitation to succeed in *Second Life*<sup>TM</sup>.

### **3.6.6.2 Technological infrastructure and support**

To host *Second Life*<sup>™</sup> learning facilitation spaces, set-up servers must be bought or dedicated space on available servers need to be reserved. The capacity of the servers must be adequate to host the necessary software, carry the avatar traffic, and enable learning facilitation to take place without any hitches (Chen, et al., 2021). An important consideration with the set-up is to train technical staff how to support learning facilitators and students in *Second Life*<sup>™</sup> (Gomes, 2020). It is pivotal that technical support staff is available before and during the implementation of *Second Life*<sup>™</sup> learning facilitation sessions (Savin-Baden, 2010). It is essential for successful learning that students and learning facilitators contact a go-to person for technical assistance on a continuous basis (Gregory & Wood, 2017). The more customised the support is to the needs of students and learning facilitators, the better the learning experience will be (Hambalee, 2020).

### **3.6.6.3 Land acquisition**

Higher education institutions must decide to either purchase or rent land within *Second Life*<sup>™</sup> (Savin-Baden, 2010). The acquired land sanctions the demarcation of an area within *Second Life*<sup>™</sup> (Fink, 2021) to be developed for learning facilitation to happen (Uzun, 2017). After the acquisition of land, either traditional, semi-traditional or non-traditional learning facilitation spaces, are created (Cook, Ingalls & Trippett, 2019). The purchasing of land, with an exclusively designed building created on this land in *Second Life*<sup>™</sup>, only becomes necessary when the higher education institution wants to ensure exclusivity or ensure privacy. Learning facilitation spaces may be co-owned or rented from other higher education institutions if exclusivity is not key (Savin-Baden, 2010). “The beauty of using *Second Life*<sup>™</sup> as a teaching and learning tool is that resources have been created to use by other researchers or facilitators that can be used for free” (Gregory, 2023:1) if exclusivity of facilitation space for the higher education institution is not required.

### **3.6.6.4 Security**

Learning facilitators should thoroughly explain security in *Second Life*<sup>™</sup> to students during orientation sessions, as well as how to handle harassment and grieving in *Second*

*Life*<sup>TM</sup>. For students and learning facilitators, to stop *harassment*, the following sequence of steps are suggested: 1) start by requesting the harasser to end the behaviour, 2) exit (temporarily) from the geographical location, 3) report the harasser to the landowner/renter in *Second Life*<sup>TM</sup> who can block<sup>20</sup> the harasser and if that does not help, 4) report the harasser to Linden Lab.

The protocol to stop *griefing* during learning facilitation sessions are suggested as: i) the learning facilitator will approach the offender first by means of a private online conversation, ii) the learning facilitator will try to end the destructive behaviour of the griever by means of a verbal warning, iii) the learning facilitator will try to end the destructive behaviour of the griever by means of a written warning, iv) the learning facilitator will then block<sup>21</sup> the griever, if possible. If all these attempts fail, the learning facilitator will report to the griever to Linden Lab (Kuznetcova, et al., 2018). Facilitators also need to prepare their students that *griefing*<sup>22</sup> can happen in the form of netiquette breached, interruptions of learning facilitation and profane language expressions. Just as preventative measures need to be put in place, counselling or debriefing must be available if students become victims of harassment, violence, vandalism or *griefing* (Gregory & Wood, 2017). Counselling services were made available in the empirical part of this study for students and these debriefing options were explained to them during the orientation session (see section 5.6.3).

If registered students themselves become guilty of harassment, assault, discrimination or stalking during learning facilitation in *Second Life*<sup>TM</sup>, disciplinary action can be taken against them. This was also explained to students during the orientation session of the empirical research (see section 5.6.3). Disciplinary action may lead to the suspension of the guilty avatar's account, or even expulsion from *Second Life*<sup>TM</sup>. In terms of precautionary security measures to be taken, students need to be informed that they can also modify and customise their avatar settings in *Second Life*<sup>TM</sup>, permitting instant

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<sup>20</sup> The owner/renter of land in *Second Life*<sup>TM</sup> can block the offender's capability to communicate within the space, close-off the avatar in total from the land, block offensive artefacts, or remove them from the land.

<sup>21</sup> The same applies as in footnote 11

<sup>22</sup> *Griefing* in *Second Life*<sup>TM</sup> is similar to *flaming* in online learning

messages or calls only from designated friends or acquaintances. They must be made aware of the description of audience suitability categorising the islands in *Second Life*<sup>TM</sup>, namely adult (A), moderate (M), or general (G). The regions or islands labelled with General (G) mean that the environments are usually safe and therefore schools, museums, universities, and houses are hosted in these areas. No mature events or displays, nudity or sexual subject matter is allowed in general regions in *Second Life*<sup>TM</sup>.

It is also recommended that entrance to learning facilitation spaces at higher education institutions in *Second Life*<sup>TM</sup> is restricted to only registered students of the institution. Signage can be posted at the entrance of the learning facilitation space indicating that the area is restricted. Students who are not part of a specific module need to be restricted from entering a class for which other students are paying (DuQuette, 2020). Access restriction is more than just the control of the movement of students into a *Second Life*<sup>TM</sup> learning facilitation space. It also implies the management of system privileges and who may upload content in a *Second Life*<sup>TM</sup> learning facilitation space. It is recommended that island administrators are appointed, to ensure that access to virtual classrooms is properly overseen (Al-Hatem, et al., 2018). They will add the usernames of the registered students onto a list for granting permission into the learning facilitation space in *Second Life*<sup>TM</sup>.

There are also add-on security tools available to lockdown higher education learning facilitation spaces and thus ensure a controlled area. *Second Life*<sup>TM</sup> space protection software is for example CasperSafe, Security Orb and Visitor Tracking System (Second Life Marketplace, 2022). Space protection software controls avatars by age, manages script usage, bans strange objects and parcels, blocks trespassing, invading or *griefing* avatars, enables no fly-zones and delivers comprehensive visitor tracking in *Second Life*<sup>TM</sup> (Erbay, Simsek & Kirişçi, 2019).

#### **3.6.6.5 Learning facilitation space design**

The design of *Second Life*<sup>TM</sup> learning facilitation spaces does not need to be similar to those of real classrooms. These spaces can be very flexible, but planned designs need

to be in place (Savin-Baden, 2010). In *Second Life*<sup>TM</sup>, learning facilitation spaces can be anywhere and in any format. They may resemble traditional classrooms or be hosted in laboratories, the Sistine Chapel, the Titanic, skyboxes, within woods or on beaches (Gibson, 2022). Decisions also need to be taken to determine if learning facilitation spaces need to be created on land, in the air or on clouds. Students can be seated on chairs, within trees, or any designed object. Furthermore, students do not even have to sit down, because their legs do not tire (Ravaei, Alonso-Martinez, Jimenez-Zayas & Sendra-Portero, 2020). The décor in *Second Life*<sup>TM</sup> learning facilitation spaces can also enhance cognitive engagement of students and variety of learning facilitation spaces is important. Décor examples are cupboards with educational attire (subject expert jackets or moderator hats) complementing the knowledge field of avatars. It is recommended that *Second Life*<sup>TM</sup> learning facilitation spaces are supplemented by rooms for student networking, and meeting casually. Furthermore, the reception area at the entrance of a higher education institution in *Second Life*<sup>TM</sup> should bear choice to obtain information. Examples to add to the reception area or along the corridors are podcasts, comments by visitors, virtual plasma screens, digital advertisements, live stream videos and presentations.

#### **3.6.6.6 Course creation**

The structure and framework of courses, just as in face-to-face learning facilitation, need to be planned and in place for learning facilitation in *Second Life*<sup>TM</sup> (Ocasio, 2016). Therefore, it is necessary that learning facilitators consult with different pockets of human expertise, like those with technical ability, online teaching experience, and subject knowledge (Savin-Baden, 2010). The design and creation of courses in *Second Life*<sup>TM</sup> are multiplex, because they need to be process-based and embedded in constructive social learning. Student-guided designs, focussing on comprehension, must become the focal point of course creation. This is necessary for learning, rather than a focus on competencies, objectives, and outcomes. Table 3.6 is proposed in this study by the researcher, based on the work of Savin-Baden (2010), as a *Checklist for Proper Planning and Design of Courses* for learning facilitation in *Second Life*<sup>TM</sup>.

**Table 3.6: Proposed Checklist for Proper Planning and Design of Courses for learning facilitation in *Second Life*<sup>TM</sup> (Liebenberg, 2022 based on Savin-Baden, 2010)**

Checklist
<b>What is the subject matter to be incorporated?</b>
Please describe:
<b>What knowledge should be acquired by students?</b>
Please list the specific learning outcomes:
<b>Who are the students?</b>
Please give a short description of envisaged students:
<b>What is required for students to commence and progress with their learning?</b>
Please list devices and technical requirements, as well as entry level requirements:
<b>How many students are ideal per learning facilitation session?</b>
Please state the ideal number per learning facilitation session:
<b>What is the role of the learning facilitator, specifically in <i>Second Life</i><sup>TM</sup>?</b>
How do you see your role as a learning facilitator in <i>Second Life</i> <sup>TM</sup> ? Please give a short description.
<b>What is the time needed for learning facilitation per session in <i>Second Life</i><sup>TM</sup>?</b>
Please indicate the time needed per learning facilitation session in <i>Second Life</i> <sup>TM</sup> .
<b>At what level must the course be pitched?</b>
Please indicate the applicable NQF level for this course.
<b>Which learning activities will best suit the specific discipline?</b>
List the learning activities that will best suit your discipline during the learning facilitation:
<b>Which theories underpin the design of the course?</b>
Name the theories that underpin the course design.
<b>Were course designers briefed by learning facilitators on how students need to acquire skills (activities, writing and/or observation)?</b>
Yes/No

The prior experience of students, their technical ability, time zones and their perceptions on the essence of learning must be considered with course design for learning facilitation in *Second Life*<sup>TM</sup>. Certain assumptions regarding course design in this domain need to be guarded against, namely the openness inworld does not imply that student numbers

in learning facilitation sessions can be unlimited. Additionally, *Second Life*<sup>TM</sup> learning facilitation does not imply that larger classes are facilitated quicker because of the technological platform, and it does not by default mean that students will learn faster and better because of this technology. Group activities still need to be capped at between eight to ten members per group for optimal learning to take place.

With course creation, facilitators need to awaken a sense of curiosity in students, prompting and supporting them to deconstruct, interrogate and challenge the existing ways of doing, and knowledge. Moreover, the pedagogical theory underpinning the module needs to be incorporated in the design of the course. Savin-Baden (2010) indicates that certain facilitation activities are more efficient towards learning in *Second Life*<sup>TM</sup>. Tours in this domain involve many senses which will better learning. If tours are coupled with streamed lectures (approximately seven minutes), small group problem-based learning, and group debate, then deep learning will become possible. Examples of effective learning facilitation methods are problem-based enquiry, experience, solution-seeking, student-guided plays, as well as role-play. Lengthy PowerPoints, lecture-based sessions, asynchronous core facilitation, and a mixture of experienced and new students in *Second Life*<sup>TM</sup> learning facilitation sessions are not conducive to deep learning. With course design, it is important to keep in mind that the artefacts, buildings, and activities need to be applicable, navigable and suitable to enhance learning (Savin-Baden, 2010).

Students can also be grouped voluntarily into a *flying squad* to direct facilitators on avenues to facilitate in *Second Life*<sup>TM</sup>. Flying squads usually give their opinions on the facilitation methods that work the best for them. It assists students if they have a channel available to discuss the challenges they encounter (disjunction, becoming numinous, lurking, dealing with silence and over-involvement by others) in the facilitation context. If students are involved as co-constructors of facilitation design, they learn in the process. They become obliged to reflect on the best ways to use specific media to encourage learning. They also acquire pedagogical skills, comprehend how *Second Life*<sup>TM</sup> is to be used as a medium of learning, evaluate if subject matter equals knowledge, form a realistic perspective on their individual skills and abilities, and own the learning created

(Savin-Baden, 2010). Facilitators must decide on the best way of assessment for their module in *Second Life*<sup>TM</sup>. Options that can be used fruitfully are team-lead projects, peer-led inquiry based on student-designed assessments, quests, report-writing, blogs, problem analysis or games in *Second Life*<sup>TM</sup> (Savin-Baden, 2010).

### 3.6.6.7 Student registration

Students must register at their higher education institution, download the *Second Life*<sup>TM</sup> viewer, create their avatars in *Second Life*<sup>TM</sup> and register as *Second Life*<sup>TM</sup> users on the website of the institution by means of a Registration Application Program Interface (API) (Kruk, 2021; Linden Lab, 2022). The Registration API enables the creation of *Second Life*<sup>TM</sup> accounts for students and gather all the information needed by the institution during the registration process. When students create the identity of their avatars, they create their first names, but must select last names from of a finite list of pre-programmed last name options. It is recommended that students register timeously before their learning facilitation sessions commence to orientate them within *Second Life*<sup>TM</sup> and familiarise them with the applicable netiquette (Savin-Baden, 2010). If the university wants students to arrive at their host institution in *Second Life*<sup>TM</sup> with ease after login, then a SLURL needs to be created. This will assist students in arriving at their learning facilitation space immediately when they enter *Second Life*<sup>TM</sup>. A registration guide for students is proposed for higher education institutions who venture into learning facilitation in *Second Life*<sup>TM</sup>.

### 3.6.6.8 Virtual artefacts

Prefabricated artefacts are present in *Second Life*<sup>TM</sup>; which can be bought or rented (Sajjanhar & Faulkner, 2019). When a decision must be made in terms of the creation of new artefacts, the time and effort to do so should be weighed against the buying or renting of existing artefacts. Virtual artefacts, such as large DNA strings in genetics, are the products of more than one prim<sup>23</sup>. University agreements need to be in place in terms of the ownership of virtual artefacts, although the intellectual property right of artefacts within the learning facilitation space of a university usually resides with that specific higher education institution (Savin-Baden, 2010).

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<sup>23</sup> Prims are also called primitive parts and represent the building blocks or parts of objects or artefacts.

### 3.6.6.9 Orientation of learning facilitators

Learning facilitators need to be familiar with *Second Life*<sup>TM</sup> procedures well ahead of the time of learning facilitation. They must know how to move around, respond, and give feedback during learning facilitation sessions in *Second Life*<sup>TM</sup> (Gregory & Wood, 2017). Learning facilitators must be prepared in terms of the technical abilities required by *Second Life*<sup>TM</sup>. Furthermore, they must be orientated and guided on how to facilitate in *Second Life*<sup>TM</sup>, because it differs from the traditional ways of facilitation. Therefore, learning facilitators need to set aside adequate time for orientation and practice before learning facilitation sessions commence. Because of the heavy reliance on technology for learning facilitation sessions in *Second Life*<sup>TM</sup>, facilitators need to prepare back-up plans if technical problems occur; if *Second Life*<sup>TM</sup> goes down or offline; power outages occur or talk features become dubious (Savin-Baden, 2010). Learning facilitators also need to familiarise themselves with specific netiquette for *Second Life*<sup>TM</sup>; namely, to respect the silence and autonomy of students as well as standing back in situations of flaming<sup>24</sup>. For the latter, facilitators only step in when the situation seems to be getting out of control. Otherwise control and power is relayed to students. Engagement with students need to take place, using a balance of positive lurking and affirmative intervention.

Learning facilitators must make a mind-shift that they are also learning and developing with the students. Learning facilitators need to acquaint themselves with how to enable or mute voice ability during learning facilitation sessions in *Second Life*<sup>TM</sup>. They can then mute the voices of students if they only want chats in written format. They must keep the balance in terms of power in mind, meaning who literally has a voice, and who not, in a learning facilitation session (Savin-Baden, 2010). Learning facilitators must also be orientated in terms of the importance of how they look when they present learning facilitation sessions in *Second Life*<sup>TM</sup>. They must be made aware that their appearance could be as significant as the knowledge that they convey. Even the names that learning facilitators choose are key because their naming might colour the educational context even before learning facilitation takes place in *Second Life*<sup>TM</sup>.

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<sup>24</sup> Learning facilitators must first evaluate if students are not able to resolve conflict situations among themselves.

### 3.6.6.10 Orientation of students

Facilitators need to orientate their students before they enter learning facilitation in *Second Life*<sup>™</sup> (Chen, et al., 2021). Offline presentations can be used to introduce students to *Second Life*<sup>™</sup> (Vrellis, Avouris & Mikropoulos, 2016). Some universities post their *Second Life*<sup>™</sup> tutorials and resources on their learning management systems (Karabatak, 2020). A one-pager with questions and answers also assists with the orientation of students; for example, what to do if you get lost; want to know where meeting places are; and when passwords are forgotten. Facilitators can also distribute lists with commonly acknowledged terms and abbreviations used in *Second Life*<sup>™</sup>; for example, in real life (irl), no problem (np), teleport (tp), thank you (ty), welcome back (wb), and you are welcome (yw) (Savin-Baden, 2010). Video clips can also be provided to students to acclimatise them. Ample orientation time should be allocated to prepare students on how to use *Second Life*<sup>™</sup> and to practice in *Second Life*<sup>™</sup>. It is recommended that students receive printed and electronic manuals before they enter into these learning facilitation sessions. A framework for these manuals was created by the author of this study and is proposed in Figure 3.10 to assist learning facilitators to prepare students.

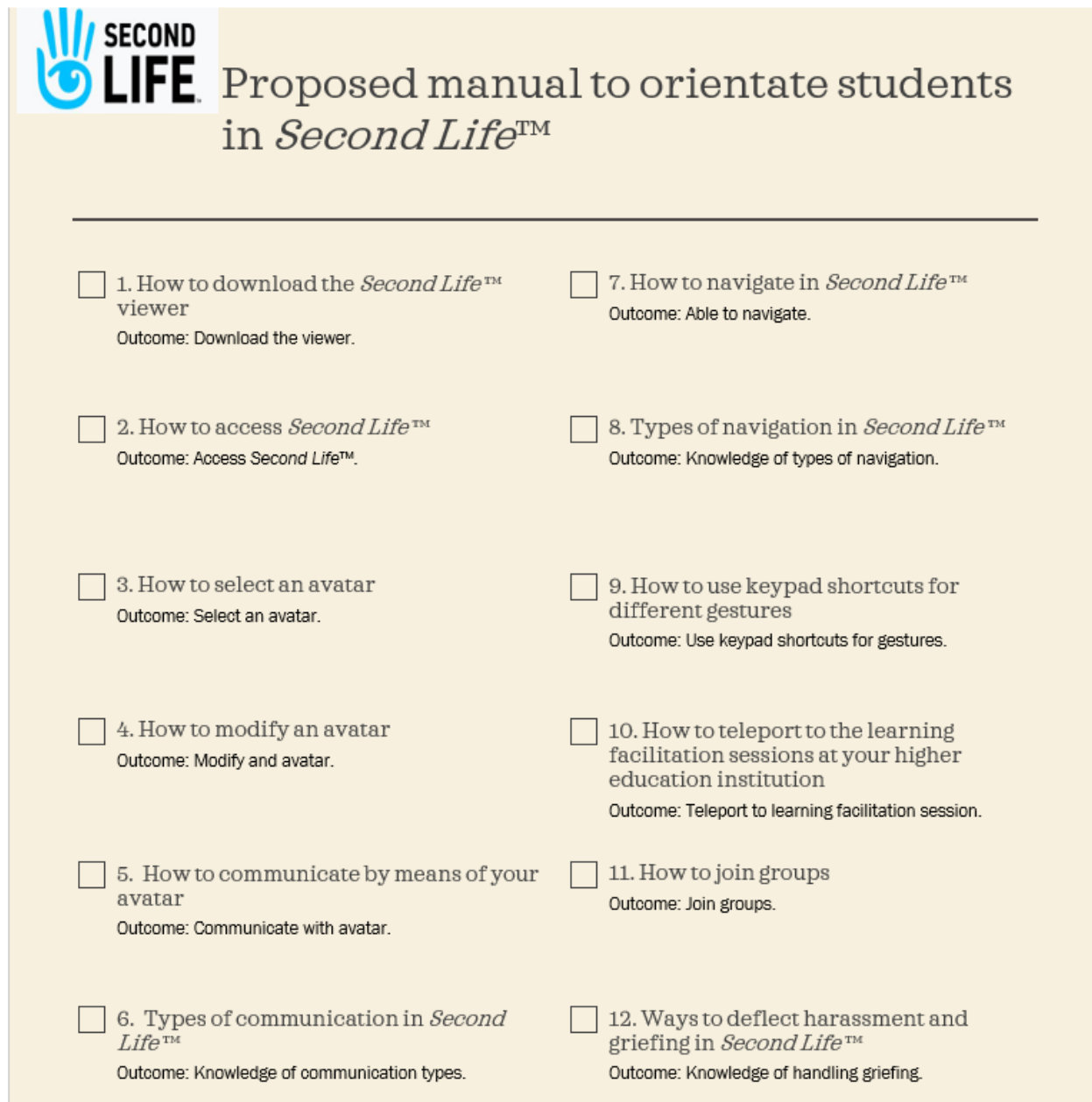


Figure 3.10: Proposed manual framework to orientate students in *Second Life*™ (Liebenberg, 2022)

It is also advised that students create their *Second Life*™ accounts and avatars during the orientation sessions. Then students can practise with their avatars before the actual classes begin (Kruk & Zawodniak, 2018). A practical way to assist students is to create an orientation island where students encounter an assistant to help them to become accustomed to the new environment. Ideally, the assistance should be presented in their

mother tongue if the class is homogeneous in terms of mother tongue. Otherwise, have translators available to translate into the mother tongue of students (Kruk, 2021).

One of the most common complaints against *Second Life*<sup>TM</sup> is that avatars often arrive at an island and then there is nobody around to help them. Although it is accepted that learning facilitators cannot be around all the time, chat bots<sup>25</sup> or greeters<sup>26</sup> can indeed assist (Savin-Baden, 2010) as well as signposts or cards. It is further recommended that students should not be exposed to too many artefacts at once when orientation starts. The description of artefacts also eases the functioning of avatars in *Second Life*<sup>TM</sup> (Nosek, Robinson-Whelen, Ledoux, Hughes, O'Connor, Lee, Goe, Silveira, Markley & Nosek, 2018). Digital strangers could be assisted with additional sessions, which could help them gain self-confidence in *Second Life*<sup>TM</sup> and improve their learning ability inworld.

Students also find it useful if facilitators provide them with a *Second Life*<sup>TM</sup> SLURL to help them register, and thereafter take them directly to their learning facilitation destination. Students must read and agree to the *Second Life*<sup>TM</sup> Terms of Service (Linden Lab, 2021), together with their Community of Practice Standards, before their learning facilitation sessions commence. These terms and standards have listed rules to ensure interaction that carries respect, tolerance, and peace. A tutor-guided tour is helpful when it comes to student orientation. When the orientation and welcome sessions are over, it is suggested that the first learning facilitation session should be playful. From there, it should gradually intensify towards deep learning (Savin-Baden, 2010).

### **3.6.6.11 Alignment of assumptions and attitude**

Alternative thinking, experiential learning and creative learning facilitation are integral within higher education learning facilitation in *Second Life*<sup>TM</sup> and this needs to be realised by learning facilitators (Duret, 2017). Hence, *Second Life*<sup>TM</sup> learning facilitation spaces should not be seen as replicas of face-to-face lecturing. Learning facilitators must guard against the replication of the dynamics of the traditional classroom. Instead, new ways

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<sup>25</sup> Chat bots are pre-programmed, but not steered by web-users. They executed certain tasks, such as moving around and pointing to information displays, as well as responding to basic questions.

<sup>26</sup> Greeters answer the questions of those who are new in *Second Life*<sup>TM</sup> and show them and visitors around.

and methods of learning facilitation need to be investigated (Ata, 2016). As soon as learning facilitators deliver PowerPoint presentations or lecture traditionally in *Second Life*<sup>™</sup>, the question needs to be raised if this fits in with learning facilitation in *Second Life*<sup>™</sup>. Constructive, experimental, authentic, and collaborative learning facilitation, which is problem-, scenario- and project-based, are best for learning facilitation in *Second Life*<sup>™</sup> (Kruk, 2021).

*Second Life*<sup>™</sup> learning facilitation spaces should be conceptualised for the co-creation of artefacts and objects, inviting communication and lively interaction. Along with attitudinal adjustments, learning facilitators should be conscious of their assumptions. They must be mindful that, although their students are Millennials and Generation Y, they might not be familiar with, or find it easy to engage with, or even enjoy being in *Second Life*<sup>™</sup>. Learning facilitators also have to reflect on their own pedagogical position in real life compared to *Second Life*<sup>™</sup>. They must also bear in mind that the position of control is no longer the prerogative of the learning facilitator. In terms of dominance of voice, the learning facilitator needs to change the assumption to intervene immediately if, for example, a student becomes unduly outspoken. Rather intervene privately and request the student to linger a little bit before commenting or give opinions.

The same principle applies to less-outspoken students. Learning facilitators need to approach them privately and ask for their contributions on the topic under discussion and cooperation within the class context. Additionally, assumptions that some learning facilitators carry that learning facilitation in *Second Life*<sup>™</sup> is easy, also needs to be contemplated (Savin-Baden, 2010). Furthermore, *Second Life*<sup>™</sup> learning facilitation is often perceived as unwanted change, with assumptions that it brings more work for already overburdened academics. Moreover, learning facilitators need to make the mind-shift that the boundaries between the academic and social life of students are disappearing. Therefore, learning facilitators need to be cautious of limiting social interaction only to educational activities. They must not forget, neglect, or ignore students' socio-emotional interactive processes. Strong emotional appeal linked to learning facilitation in *Second Life*<sup>™</sup> will positively influence assumptions of students, increase

their acceptance, engagement, involvement, valuation, and use of *Second Life*<sup>™</sup>, with learning as result (Savin-Baden, 2010). Optimal learning takes place if virtual students feel that they belong and that they carry assumptions of fellow students that can be trusted (Tidy, 2021).

#### **3.6.6.12 Role of innovators, peers, and support groups**

The Adoption and Diffusion Model of Rogers (Rogers, 1995) holds that technological innovation often leads to the formation of different groups based on their perception of the new technology. Their perceptions on the ease of use of technology influence their adoption of the new technology. They then become either innovators, early adopters, an early majority, a late majority, or laggards. With new technology adoption in higher education, like learning facilitation in *Second Life*<sup>™</sup>, enthusiastic innovators and early adopters must be identified. They are the best positioned groups in a higher education institution to support the introduction of new technology to learning facilitation. Furthermore, the implementation of learning facilitation in *Second Life*<sup>™</sup> does not just happen. Besides institutional support, the drive of innovators, the support of peers and departments are important to successfully adopt learning facilitation in *Second Life*<sup>™</sup>. Open debate and discussion sessions for both interested and cynical learning facilitators with regard to *Second Life*<sup>™</sup> learning facilitation is necessary. Further peer efforts could be real-life demonstrations on learning facilitation in *Second Life*<sup>™</sup>, sandbox sessions to stimulate conversation and afford learning facilitators the opportunity to experiment and to be mentored, as well as support groups for learning facilitators in *Second Life*<sup>™</sup> (Savin-Baden, 2010). Those with experience in *Second Life*<sup>™</sup> often form support groups that can be consulted in preparation for *Second Life*<sup>™</sup> learning facilitation. Examples are the National Workshop on Learning in Immersive Virtual Worlds and the *Second Life*<sup>™</sup> Educators group (Linden Lab, 2022).

### **3.7 Conclusion**

In this chapter, technology driven changes in higher education, the technological context in higher education in Africa, the evolution of the World Wide Web and its offerings for higher education learning facilitation and virtual worlds and higher education learning

facilitation were discussed. The focus of this chapter fell on higher education learning facilitation in *Second Life*<sup>™</sup>, commencing with an overview of the origins of *Second Life*<sup>™</sup>, a description of *Second Life*<sup>™</sup>, lessons learnt from research on learning facilitation in *Second Life*<sup>™</sup>, the benefits and limitations of *Second Life*<sup>™</sup> and considerations on how to set up higher education learning facilitation in *Second Life*<sup>™</sup>. Based on this literature review, a *Checklist for Course Creation in Second Life*<sup>™</sup> is proposed, as well as a *Framework for a Manual* to orientate students in *Second Life*<sup>™</sup>.

In the next chapter, the Action Research Theory, which forms the theoretical perspective of this dissertation, will be discussed and an adapted Virtual World Adjustment Theory proposed.

# CHAPTER 4

## EXPLORATION OF HIGHER EDUCATION LEARNING FACILITATION LANDSCAPE IN *SECOND LIFE*<sup>TM</sup>

### 4.1 Introduction

This chapter is a continuation of the exploration of the landscape of higher education institutions that have a learning facilitation presence in *Second Life*<sup>TM</sup>. The literature review in Chapter 3 serves as the foundation and the background to the exploration of the landscape in this chapter. Although the literature review is a non-empirical part of the study, it plays a critical role towards the aim of the study to explore how learning can be effectively facilitated in a *Second Life*<sup>TM</sup> classroom at an African University.

Complementary to the literature review, it is regarded as imperative and meaningful to investigate key features of higher education learning facilitation through *Second Life*<sup>TM</sup>, globally because the setting of this study is at a university in an African context, but within the global context. It is important for future researchers and decision-makers at universities to understand the bigger picture and landscape associated with learning facilitation through *Second Life*<sup>TM</sup>. Information on the extent of successful implementation on other continents, the types of institutions that implemented learning facilitation through *Second Life*<sup>TM</sup> with success, the student numbers of these institutions, the types of facilitation settings used at these institutions, the subject fields mostly facilitated as well as the learning facilitation methods that lead to learning is critical for a continent where a need for innovation has been expressed. From the analysis of data gathered from the literature review and the empirical research, possibilities and new horizons can open for African higher education institutions and their students.

Therefore, the focus in this chapter in response to the second research question, will be to continue the landscape exploration starting in Chapter 3 in an empirical way by specifically investigating the 148 higher education institutions in the world that were found

to be engaged in learning facilitation through *Second Life*<sup>TM</sup>. The exploration will be in the form of a content analysis of the online information available on the websites of higher education institutions that are engaged in *Second Life*<sup>TM</sup>. Specifically, the analysis will focus on the institutions' geographical location, the nature of independence of the higher education institutions, the size of the higher education institutions, the types of learning spaces that they are using in *Second Life*<sup>TM</sup>, the subject fields that are facilitated in *Second Life*<sup>TM</sup> and learning facilitation methods that they experience as leading to learning.

Figure 4.1 shows how this chapter fits into the overall study plan. Chapter 4 therefore describes the research design and methodology relevant to the mentioned research question. The research design, which describes the strategy of how the research was planned to be done, is followed by the research methodology, which elaborates on how this planned strategy was executed (Babbie & Mouton, 2002). Within this discussion, the research population, the selection of a sample, the data sources and the methods of data collection is explained. The gathered data is then analysed by means of content analysis

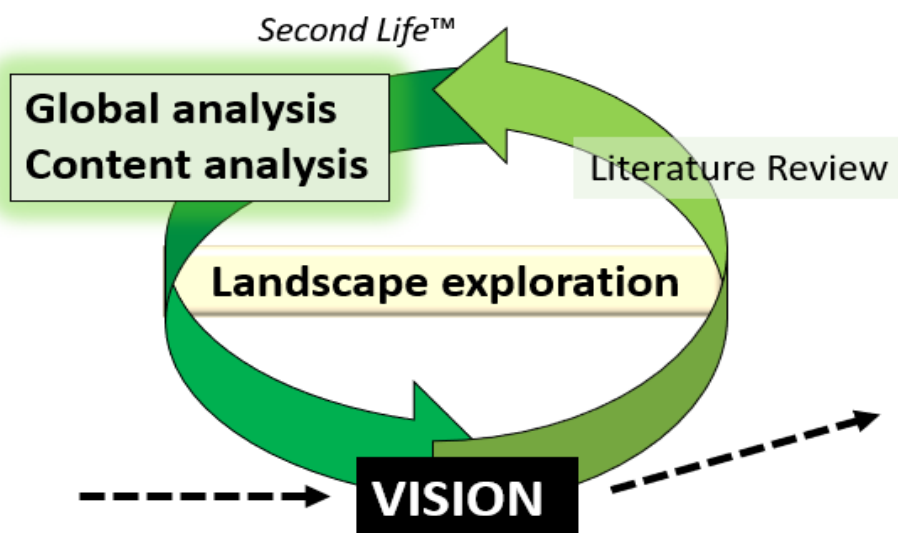


Figure 4.1 Exploration of higher education learning facilitation in *Second Life*<sup>TM</sup> (Liebenberg, 2022)

and thereafter interpreted. Subsequently, the interpreted data is presented. The reason for this structure of having the research design and methodology as well as data analysis in one

chapter is for the sake of clarity, because each research question in this study has a different research design and methodology, with consequential data analysis and interpretation. The same structure as used in Chapter 4 will also be used for Chapter 5.

Ethical considerations are annotated after the presentation of the interpreted data, and quality assurance concludes the chapter.

## **4.2 Research design and methodology**

The research design of a study is the plan and appropriate framework to study social or natural phenomena under investigation. The research design of a study is driven by the research aim of the study to ensure that the evidence obtained addresses the research aim as effectively and unambiguously as possible (Sileyew, 2019). It is the strategy that a researcher chooses to investigate and integrate the different parts of the study in a structured, coherent, and logical way to address the research problem. The research design is like a blueprint for the study to follow, influencing data collection, data measurement and the analysis of data (Cohen, et al., 2017; Kirshenblatt-Gimblett, 2006). Research methodology is concerned with the implementation of the research design and sets out the individual steps and the most objective procedures and methods to be used to collect data, where the data will be collected from, how it will be collected as well as how it will be analysed (Mouton, 2001; Vosloo, 2019). Research methodology demarcates what data will be collected and who will collect it. Furthermore, it details how a researcher intends to ensure valid and reliable results that address the research aim and questions (Jansen & Warren, 2020).

This chapter, which links to the second research question of this study, has a research design and methodology that is different from the research design and methodology of the subsequent chapter. The research design and methodology used in this chapter is exploratory content analysis.

Exploratory research investigates research questions that were not previously studied in-depth or where past data is absent (George, 2021). Exploratory research may be of quantitative or qualitative nature and is flexible and open-ended; sometimes informal. This type of research helps the researcher to better comprehend the phenomenon under investigation. Exploratory research usually lays the foundation for future research (see Chapter 6), because its aim is not to provide conclusive answers to questions.

Content analysis means the interpretation of the content of written, oral, recorded, audio-visual, verbal, or visual messages - in videos, text messages, books, newspapers, hypertext, or narrative diary entries. Because content analysis is a scientific study of content, it therefore also includes the study of context, meaning, subtext and intentions surrounding, and contained in, messages (Hsieh & Shannon, 2005). Content may either be manifest or latent. Manifest content is observable and visible content, while latent content is the hidden meanings to manifest content. The process of content analysis identifies themes and patterns and use a classification process to code them. This research method overarches the subjective interpretation of content data. Content analysis can be done in a quantitative or qualitative way.

Content analysis, as used in this study, deals with the analysis of the existence and frequency of identified concepts on the web pages of higher education institutions that facilitate in *Second Life*<sup>™</sup>. The process of qualitative content analysis generally follows the following steps: skim the selected material and list the main themes planned to be analysed and classify content according to these themes into units of analysis or basic units of measurements (words, phrases, sentences, or images). Furthermore, quantitative content analysis means that the information is converted into quantifiable form, whereafter the coded information and themes are quantified by counting frequencies. Content analysis is objective since different researchers will most likely be able to obtain the same results from the same sources because content analysis is directed by clear-cut rules. Furthermore, it is systematic because content is included and excluded based on reliable rules. Content analysis carries external validity and is generalisable because the results obtained by the researcher can usually be generalised and applied to similar contexts. Content analysis is an effective method to conduct unobtrusive research because material, rather than people, is actually studied. The downside of content analysis is that it may be time-consuming (Parveen & Showkat, 2017).

For this chapter relating to the second research question, content analysis was done by visiting the *Second Life™: Education* website (Linden Lab, 2022) whereby all education institutions affiliated with *Second Life™*, and registered with Linden Lab as educational institutions, are listed. A process of sifting was then managed to exclude all educational institutions that were not in the higher education domain. All higher education institutions facilitating learning in *Second Life™* were listed and then visited one by one. Before the institutions were visited, the categories of analysis were determined and rules for coding set (see Table 4.1). On the websites of the universities, there were descriptions and images of the key features about their learning facilitation in *Second Life™*. The written text and images on the documents of each university were coded according to the set rules and the data were then analysed.

As indicated, the landscape exploration in the form of content analysis was on the online information available on the websites of higher education institutions that are involved in learning facilitation in *Second Life™*. Categories of analysis for this chapter were determined as the geographical location of higher education institutions, the size of the higher education institutions, the nature of independence of the higher education institutions, the types of learning spaces that they are using in *Second Life™*, the subject fields that are facilitated in *Second Life™* and learning facilitation methods which the institutions use and experience as leading to learning. The rules set for coding, with regard to each of the categories, are tabulated in Table 4.1 below. The first four categories of analysis entail predetermined codes and fall in the category of deductive coding. The last two categories of analysis emerged from the data observed and are typical of inductive coding. These codes developed and were not known in advance, which signifies the qualitative processes present in the multi-methodology leading to triangulated results.

**Table 4.1 Categories of analysis and rules set for coding (Liebenberg, 2022)**

Category of analysis	Rules for coding	Coding of key features
Geographical location of the higher education institutions.	Demarcated as the identifiable country per continent in which these higher education institutions were located.	Number of higher education institutions in the world with an active learning facilitation presence in <i>Second Life</i> <sup>TM</sup> , per country per continent.
The nature of independence of the higher education institutions.	The nature of independence is categorised based on main financial sources of income to be either private (none to very little state subsidy) or public (more state subsidy than from other funds).	Nature of independence of the higher education institutions in the world with an active learning facilitation presence in <i>Second Life</i> <sup>TM</sup> , namely private or public.
Size of the higher education institutions.	The size of a higher education institution is described as small if student enrolment is less than 9,999 students enrolled, medium if there are between 10,000 and 39,999 students enrolled and large if there are more than 40,000 students enrolled.	Size of the higher education institutions in the world with an active learning facilitation presence in <i>Second Life</i> <sup>TM</sup> , namely small, medium, and large.
The types of learning spaces that the higher education institutions are using in <i>Second Life</i> <sup>TM</sup> .	Based on the features of a traditional classroom, learning spaces can be traditional or the opposite as non-traditional. Classrooms that carry elements of traditional classrooms, but are also having non-traditional aspects, are coded as semi-traditional.	Classroom design used in <i>Second Life</i> <sup>TM</sup> may be traditional, semi-traditional and non-traditional.
The subject fields that are facilitated in <i>Second Life</i> <sup>TM</sup> .	No rules for coding are applicable here, since this category is open for any subject fields that are facilitated at higher education institutions.	Any subject fields in which learning facilitation in <i>Second Life</i> <sup>TM</sup> took place.
Learning facilitation methods used for learning facilitation in <i>Second Life</i> <sup>TM</sup> .	No predetermined rules for coding are applicable here, since any learning facilitation method used at higher education institutions during learning facilitation can be annotated.	Any facilitation methods used during learning facilitation in <i>Second Life</i> <sup>TM</sup> .

Explanations of the coding of the key features of higher education institutions facilitating in *Second Life*<sup>TM</sup> are following. The number of higher education institutions in the world with an active learning facilitation presence in *Second Life*<sup>TM</sup> implies the numerical values tallied for these institutions. Quantitative cardinal data was gathered on the number of

these higher education institutions within countries or states, on the seven continents of the world.

The nature of independence of higher education institutions in the world with an active learning facilitation presence in *Second Life*<sup>TM</sup> is divided for this study into two categories, namely public higher education institutions or private higher education institutions. This study uses the definition of The Queensland Human Rights Commission (2020:1) for public higher education institutions, that is “providing services to the public on behalf of the government or another public entity”. A private higher education in this study follows the definition of a for-profit institution and “any other entity than a state, local government” holding (Justia US Law, 2020). Quantitative nominal data was gathered on the nature of higher education institutions with an active learning facilitation presence in *Second Life*<sup>TM</sup> within countries or states, on the seven continents of the world.

The student enrolment numbers of the higher education institutions in the world with an active learning facilitation presence in *Second Life*<sup>TM</sup> is determined in this study by the number of students enrolled at the institution. Higher education institutions in this study with a total student population of below 10,000 students are categorised as small, those with a total student population of 10,000 - 39,999 students are classified as medium, and those with a total student population of 40,000 or more students are regarded as large higher education institutions. The total student population for all the higher educations is based on the 2019 student enrolment numbers of the universities for uniformity and standardisation. Quantitative ordinal data was gathered on the size of higher education institutions with an active learning facilitation presence in *Second Life*<sup>TM</sup> within countries or states, on the seven continents of the world.

The classroom design used in *Second Life*<sup>TM</sup> by the higher education institutions with an active learning facilitation presence in this virtual world is defined for this study as either traditional, semi-traditional and non-traditional. The definition of Yale (2022) is followed in this study for traditional classroom design, namely where the setup of the learning facilitation space typically has rows of fixed seating. In this space, students face the

lecturer with their backs to other students. Traditional classroom design in *Second Life*<sup>TM</sup> is considered as a virtual replica of traditional classrooms of universities in real life. Merrill (2018) defines flexible or non-traditional classroom design as living systems created by the specific students and facilitators in the various learning facilitation spaces. An infinite variety of configurations is possible, with no space resembling the preceding or next. Non-traditional classroom design in this study is characterised by novel and innovative configurations of the learning facilitation space, which imply that it can take any form. A semi-traditional classroom design in this study is seen as a learning facilitation space that is structured, but not resembling a traditional classroom design. Quantitative ordinal data was gathered on the classroom design of higher education institutions with an active learning facilitation presence in *Second Life*<sup>TM</sup> within countries or states, on the seven continents of the world. Qualitative observations, with screen captures taken by the researcher, also contributed to describing the classroom design used in *Second Life*<sup>TM</sup>. Quantitative and qualitative data is used for the triangulation of data.

The subject fields in which learning facilitation in *Second Life*<sup>TM</sup> took place refer to a knowledge discipline or the branch of knowledge with which students and the learning facilitator engage during learning facilitation (Webster Dictionary, 2022). In this study, it is called the facilitation focus. Because learning facilitation in *Second Life*<sup>TM</sup> is usually not rolled out to the entire higher education institution where it is employed, data was gathered to see which subject fields or facilitation focus attracts learning facilitation in *Second Life*<sup>TM</sup>. Quantitative nominal data was gathered on the facilitation focus of higher education institutions with an active learning facilitation presence in *Second Life*<sup>TM</sup> within countries or states, on the seven continents of the world. Qualitative observations, with the screen captures, also contributed to the description of the learning facilitation subject fields employed in *Second Life*<sup>TM</sup>. Quantitative and qualitative data are used for the triangulation of data.

The facilitation methods used during learning facilitation in *Second Life*<sup>TM</sup> are seen in this study as more than facilitation tools. In this study, facilitation methods are viewed according to the description of North Star Facilitators (2022) and the Merriam-Webster

Dictionary (2022) as activities that are planned in such a way that they lead to end results. It is seen in this study as the facilitation mode that the learning facilitator selects. Quantitative nominal data was gathered on the facilitation methods of learning facilitators at higher education institutions with an active learning facilitation presence in *Second Life*<sup>™</sup> within countries or states, on the seven continents of the world. Qualitative observations, with screen captures by the researcher, also contributed to describing the learning facilitation methods employed in *Second Life*<sup>™</sup>. Quantitative and qualitative data are used for the triangulation of data. Comprehensive raw data collected on the facilitation focus and facilitation methods used by the 148 universities in *Second Life*<sup>™</sup> is presented in Appendix E for the world and Appendix F per continent.

In this chapter, the coded content was of both qualitative and quantitative nature. The quantitative data was used to discover and describe the facts regarding the above categories of analysis (Cohen, et al., 2017; Cooper, Schindler & Sharma, 2018; McLeod, 2019). Quantitative data in the content analysis was obtained from the numerical data for the number of higher education institutions facilitating globally in *Second Life*<sup>™</sup>, as per country within continents and their nature of independence and student enrolment numbers or university size. The classroom design categories of higher education institutions facilitating globally in *Second Life*<sup>™</sup>, their facilitation foci and facilitation methods were also counted. The units of measurements within these categories were tallied and frequencies, central tendency indicators and correlations were calculated as descriptive statistics to interpret the collected data. Inferential statistics were also used to interpret the data by means of the Chi-squared test, which explored the extent to which key features are associated.

The qualitative data was used to comprehend, explain, and interpret the coded categories, which increased in-depth knowledge about the phenomena under investigation. Patterns emanated from the interpreted qualitative data, obtained from these categories. Qualitative data from the content analysis was gathered on the classroom design of higher education institutions facilitating globally in *Second Life*<sup>™</sup>, the subject fields in which learning facilitation happened and the facilitation methods used.

Quantitative and qualitative data were thus used to determine globally what the key features of higher education learning facilitation in *Second Life*<sup>™</sup> are.

The next sections describe the chosen population and sample selection for this chapter, the data sources and collection of data, the analysed data, ethical considerations, and quality assurance; all of which relate to the second research question of this study.

### **4.2.1 Population**

A population is a group of people or units that meet all the inclusion criteria of a study, and it further means all the people or units that have shared features or characteristics, as defined for the particular study (Mishra & Alok, 2017). A population refers to an entire group of humans or phenomena that the researcher wants to draw conclusions on and would like to know more about (Vosloo, 2019). To reach every member of a specific population during research is very difficult most of the time. A precise demarcation of a population assists to gather a representative sample from the specific population.

In this chapter, the population refers to all the higher education institutions facilitating in *Second Life*<sup>™</sup> globally. This population relates to the second research question, namely What are the key features of the landscape associated with learning facilitation in *Second Life*<sup>™</sup> classrooms at higher education institutions globally? As indicated in section 1.1, there are 148 higher education institutions that are engaged in learning facilitation globally in *Second Life*<sup>™</sup>. This means that the population size pertaining to this research question equals 148 higher education institutions globally.

### **4.2.2 Sample Selection**

A sample refers to a group of participants (or phenomena) from a population that the researcher uses to collect data from and that is relevant to the undertaken study. Samples are selected to make research more manageable, because it is not always possible to reach every participant or phenomenon from a whole population (Cohen, et al., 2017). When all the participants of the whole population are used as the sample for a study, it is called census sampling. Census sampling, or a complete enumeration, means

that information is obtained from every one of the participants (or phenomena) in a population (Cooper, et al., 2018).

All higher education institutions affiliated with *Second Life*<sup>™</sup> and registered with Linden Lab as educational institution was visited. A process of sifting was then managed to exclude all educational institutions that were not in the higher education domain, like facilitating learning at secondary or primary school level. The list of all higher education institutions was then visited one by one. Before arrival, the categories of analysis were determined and rules for coding set (see Table 4.1). On the websites of the universities, there were descriptions and images of the key features regarding their learning facilitation in *Second Life*<sup>™</sup>. The written text and images on the documents of each university were coded according to the rules and the data analysed.

For the population in this chapter, namely the 148 higher education institutions facilitating in *Second Life*<sup>™</sup> globally, the full population was acquired as a sample. Therefore, the sampling constitutes census sampling. Each one of these 148 higher education institutions facilitating in *Second Life*<sup>™</sup> globally was located and visited. Information on their geographical location per country per continent, their nature of independence, student enrolment size, types of classroom design used within *Second Life*<sup>™</sup>, facilitation foci and facilitation methods were observed on their websites and analysed by means of content analysis. The census sample is used to answer the research question: What are the key features of the landscape associated with learning facilitation in *Second Life*<sup>™</sup> classrooms at higher education institutions globally?

### **4.2.3 Data collection**

In this section, the data sources, and the data collection methods, in response to the second research question of the study, are discussed.

#### **4.2.3.1 Data sources**

There are two groups of data sources available for researchers to use when phenomena are studied, namely primary and secondary data sources. Original sources of information

are considered primary data sources. Primary data is gathered, for example from observation, interviews, discussions, surveys, websites, and questionnaires. Secondary data originates from sources where the researcher is not directly involved, such as desk top reviews and visiting existing documents, which can be websites. The categorisation of websites as primary or secondary depends on the way that they are used (Schmitz, 2022). Websites are secondary of nature if they summarise, evaluate and process information from primary sources. But they become primary sources if information is gathered from them by the researcher and the research is not just a mere display of information that has been placed on the websites. Primary data is deemed more reliable and associated with a higher confidence level. In this study, the gathered data and observations flow from websites regarded as primary data sources. Primary data was obtained from the websites of the census sample of higher education institutions globally that facilitate in *Second Life™*.

#### **4.2.3.2 Data collection methods**

Data collection methods refer to the techniques that are used to collect data in a scientific way to gain first-hand knowledge concerning the research question under investigation. Examples of data collection methods are surveys, questionnaires, observation, and content analysis.

Content analysis was used to explore the global landscape of higher education learning facilitation in *Second Life™* as well as determine the frequency, central tendency, and association of the identified units of measurements on the web pages of these institutions. The categories of analysis were first determined, rules for coding set, the text was coded according to the rules and the data analysed. As indicated, the landscape exploration by means of content analysis focused on the information available on the websites of higher education institutions in *Second Life™*. Categories of analysis were determined as their geographical location, the size of these institutions, the nature of their independence, the types of learning spaces that they are using in *Second Life™*, the chosen subject fields that are facilitated in *Second Life™* and learning facilitation methods used to ensure learning. The rules regarding each of the categories were set (Cohen, et al., 2017). The

data collected were of quantitative and qualitative nature. Quantitative data was collected by counting the units of measurement systematically according to the set rules. Qualitative data was collected from notes taken on what was observed on the websites in terms of these set categories. Any further, relevant information was also recorded. Primary data was collected for all the identified categories.

### 4.3 Data analysis

Data analysis means that statistical techniques are applied to the collected qualitative and quantitative raw data to describe the data, find patterns regarding data themes or to explore their relationships (Cooper, et al., 2018). The results of the data analysis in this study were verified, and validated (Cohen, et al., 2017).

In terms of the quantitative data scales for the identified categories of data, cardinal data is associated with the number of higher education institutions and nominal data regarding the nature of independence of the institutions, facilitation foci and facilitation methods. Ordinal data was gathered from the size and classroom design of the universities. Descriptive statistics is presented in terms of frequency distribution, central tendency, variation, standard deviation, and cross tabulation. Non-parametric statistical analysis is appropriate in terms of the inferential statistics in this study, namely the Chi-square one-sample test.

The data analysis for the gathered qualitative data happened by means of noting observations in terms of the identified categories. Any other relevant data was also recorded, coded, and interpreted. The data on the key features of higher education learning facilitation in *Second Life*<sup>TM</sup> are presented, analysed, and interpreted in the next sections.

#### 4.3.1 Distribution of higher education institutions globally with an active learning facilitation presence in *Second Life*<sup>TM</sup>

Five of the seven continents in the world have a higher education learning facilitation presence in *Second Life*<sup>TM</sup>. They are North America (United States of America [USA] and

Canada), Europe, Australasia (Australia and New Zealand), Asia and South America. Africa and Antarctica do not have a higher education learning facilitation presence in *Second Life*<sup>™</sup>.

North America has 95 universities that facilitate within *Second Life*<sup>™</sup>. These universities are distributed across the whole continent with 92 universities from the USA and 3 from Canada. Figure 4.2 shows the distribution of these universities across all states. California and Texas are the most active with higher education learning facilitation in *Second Life*<sup>™</sup>, followed by Florida and Ohio. The higher concentration of these active universities falls in the south-western part of North America.

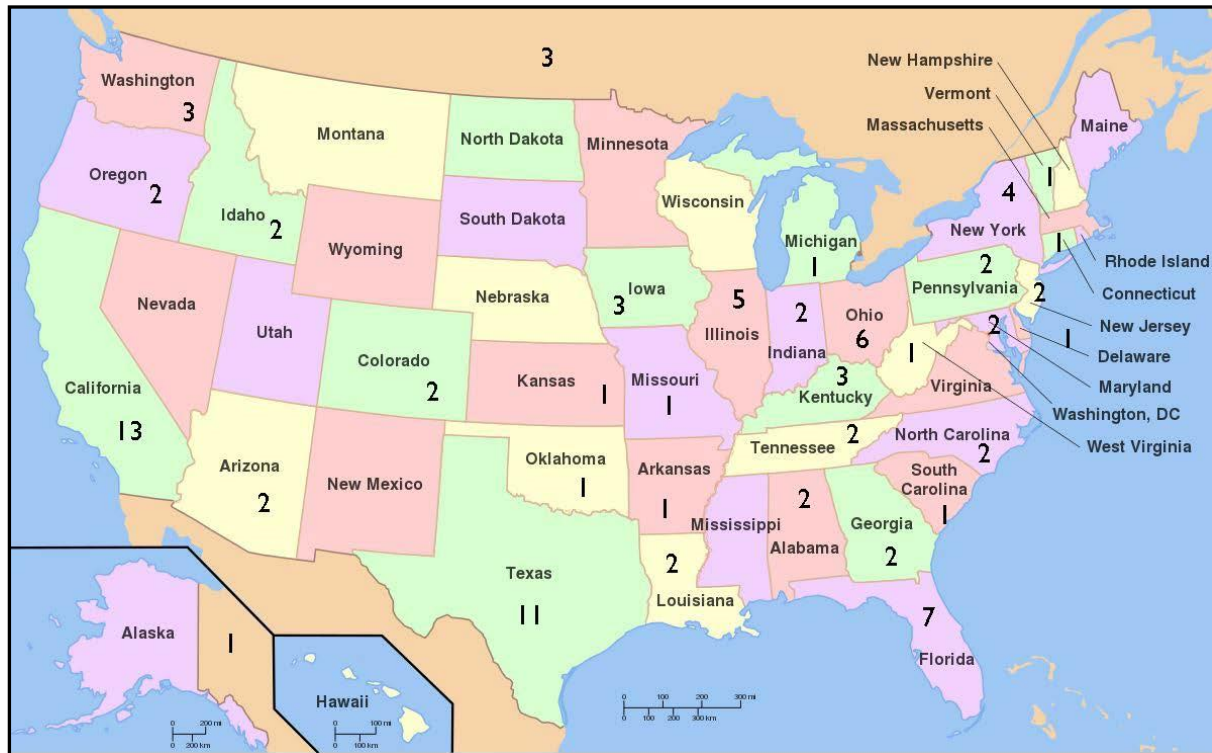


Figure 4.2: Map of North American with number of universities in Second Life™, indicated per state (Liebenberg, 2020)

Europe with its 44 countries, has 31 universities that facilitate within *Second Life*™. These universities are scattered across the continent but concentrated mainly in the United Kingdom (UK). Figure 4.3 maps their distribution.



State	Number	State	Number	State	Number
England	16	Greece	1	Spain	1
Germany	3	Netherlands	1	Sweden	1
Finland	2	Portugal	1	Switzerland	1
Ireland	2	Scotland	1	Wales	1

Figure 4.3: Map of Europe, with number of universities in Second Life™, indicated per country (Liebenberg, 2020)

The United Kingdom to the west of Europe, leads the number of universities that are active in *Second Life*™ in Europe.

Australasia with Australia (split in 7 states) and New Zealand (with a North and South Island), have 14 universities that facilitate within *Second Life*™. These universities are distributed over Australia, with a concentration towards the south-eastern part, but are non-existent in New Zealand. Figure 4.4 provides a representation of the distribution of higher education institutions facilitating in *Second Life*™ in Australasia.

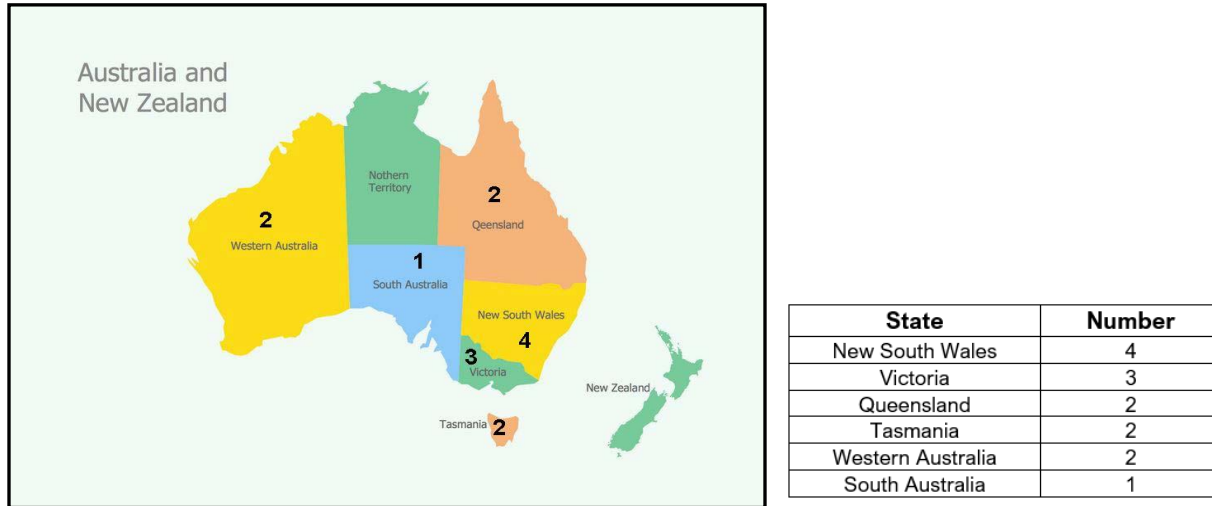


Figure 4.4: Map of Australasia, with number of universities in Second Life™, indicated per state (Liebenberg, 2020)

Asia with 5 sub-regions has only 5 universities that facilitate within *Second Life*™. They are located more to the eastern and central parts of Asia. See Figure 4.5 to view their distribution.

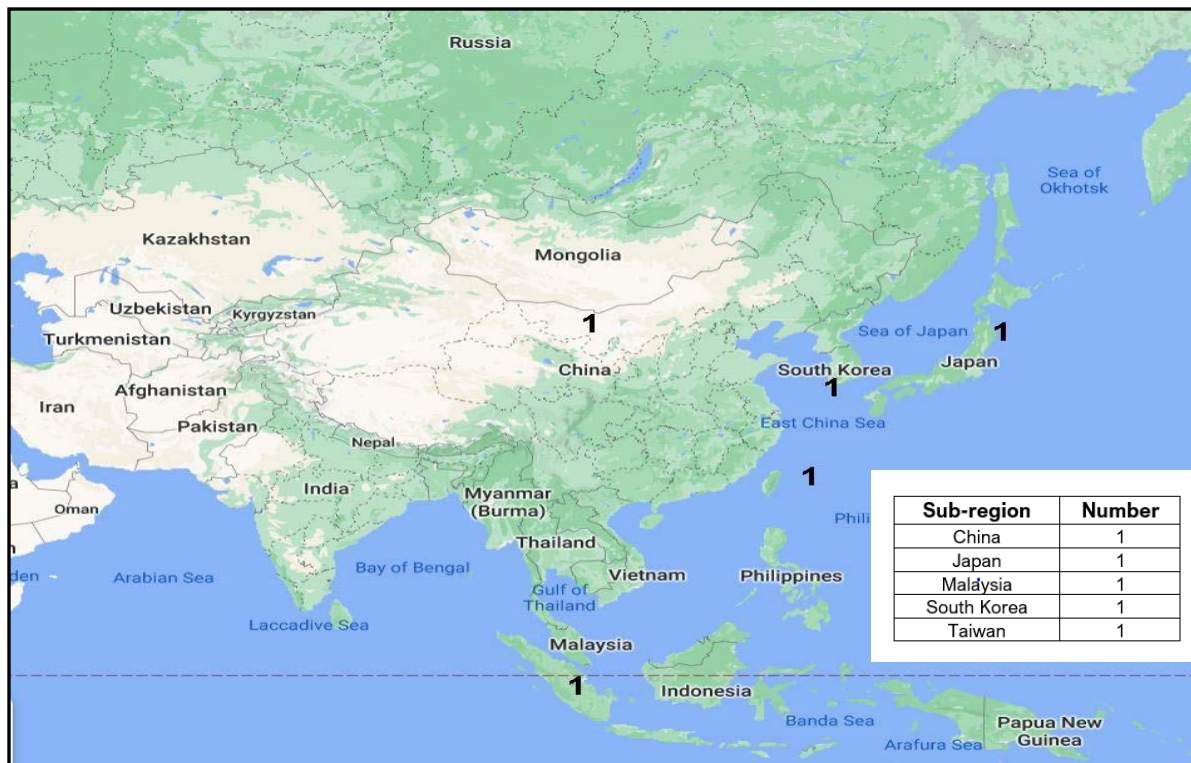


Figure 4.5: Map of Asia, with number of universities in Second Life™, indicated per sub-region (Liebenberg, 2020)

South America is segmented into 12 states. Only 3 universities in South America facilitate within *Second Life*<sup>TM</sup>. They are positioned in the northern part of the continent. Figure 4.6 shows the positioning of these universities.



Africa with its 54 countries (Worldometer, 2022) and Antarctica, with 7 nations who have territorial interest in this continent, do not have a higher education learning facilitation presence in *Second Life*<sup>TM</sup> at all.

State	Number
Brazil	2
Colombia	1

Figure 4.6: Map of South America, with number of universities in *Second Life*<sup>TM</sup>, indicated per state (Liebenberg, 2020)

In Table 4.2 the continents with the number of universities per continent are summarised, indicating in the last column (Column D) the ratio of geographical divisions (states, countries or sub-regions) per continent to the number of universities that facilitate within *Second Life*<sup>TM</sup> per continent.

**Table 4.2: Geographical divisions per continent and number of universities that facilitate within *Second Life*<sup>TM</sup> (Liebenberg, 2022)**

<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>
<b>Continent</b>	<b>Geographical divisions</b>	<b>Number of universities that facilitate within <i>Second Life</i><sup>TM</sup></b>	<b>Ratio of Column B to Column C</b>
North America	50	95 (64%)	1:1,9
Europe	44	31 (21%)	1:0,8
Australasia	9	14 (9%)	1:1,6
Asia	5	5 (3%)	1:1
South America	12	3 (2%)	1:0,25
Africa	54	0 (0%)	1:0
Antarctica	7	0 (0%)	1:0
<b>Total</b>	<b>181</b>	<b>148 (100%)</b>	<b>1:0,8</b>

In terms of the world, North America has the largest representation (64%) of higher education institutions facilitating in *Second Life*<sup>TM</sup>. The second and third largest presence are also situated in developed continents (World Economic Situation and Prospects, 2022), namely Europe (21%) and Australasia (9%) respectively. The developing world trails with only 3% and 2% of higher education institutions facilitating in *Second Life*<sup>TM</sup> from the respective continents of Asia and South America. Africa and Antarctica do not have any presence. Figure 4.7 provides a map of the world as a summary of the preceding descriptions of the numbers on the continents with higher education institutions facilitating in *Second Life*<sup>TM</sup>.

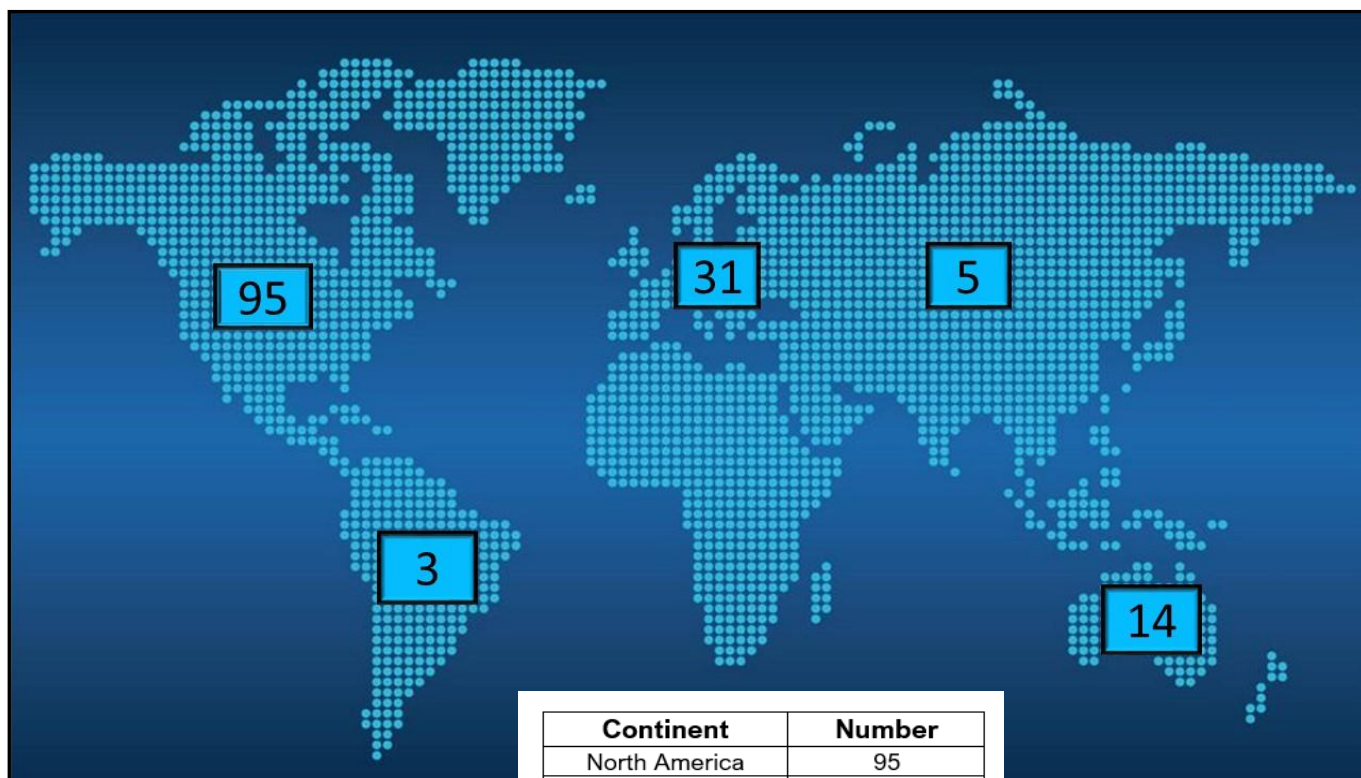


Figure 4.7: Map of the world, with the number of universities in *Second Life*<sup>™</sup>, indicated per continent (Liebenberg, 2020)

The map in Figure 4.7 shows the inequality of the numbers of higher institutions facilitating in *Second Life*<sup>™</sup> in the developed world (95%) compared to the number in the developing world (5%). This data, combined with the gap in research highlighted by the literature review, confirms the need for this study.

### 4.3.2 Nature of independence of higher education institutions globally engaged in learning facilitation in *Second Life*<sup>™</sup>

Most of the higher education institutions in the world that engage in learning facilitation in *Second Life*<sup>™</sup>, are of public nature. Table 4.3 shows that the majority of 116 (78%) are public universities and the other 32 undertaking learning facilitation in *Second Life*<sup>™</sup> are private universities (22%). Reasons for this difference may not necessarily be because of the subsidies received from government for research (on learning facilitation for example)

by public universities, but it may also be attributable to innovation commitments of public universities to their communities and regions (Yong, 2020).

**Table 4.3: Nature of independence of the universities engaged in learning facilitation in *Second Life*<sup>TM</sup>**

Continent	Nature	Number	Percentage per continent	Percentage of the world
North America	Public	74	78%	50%
	Private	21	22%	14%
	<b>Total</b>	<b>95</b>	<b>100%</b>	<b>64%</b>
Europe	Public	26	84%	18%
	Private	5	16%	3%
	<b>Total</b>	<b>31</b>	<b>100%</b>	<b>21%</b>
Australasia	Public	13	93%	8%
	Private	1	7%	1%
	<b>Total</b>	<b>14</b>	<b>100%</b>	<b>9%</b>
Asia	Public	2	40%	1%
	Private	3	60%	2%
	<b>Total</b>	<b>5</b>	<b>100%</b>	<b>3%</b>
South America	Public	1	33%	1%
	Private	2	67%	1%
	<b>Total</b>	<b>3</b>	<b>100%</b>	<b>2%</b>
<b>Global</b>	<b>Nature</b>	<b>Number</b>	<b>Percentage</b>	
Worldwide	Public	116	78%	
	Private	32	22%	
	<b>Total</b>	<b>148</b>	<b>100%</b>	

This majority percentage of public higher education institutions engaged in higher education learning facilitation in *Second Life*<sup>TM</sup> in the world is mirrored in the ratio of the public to private universities in North America that facilitate in *Second Life*<sup>TM</sup>. A total of 74 universities (78%) are public universities, while 21 universities (22%) are private universities on this continent. The dominant representation of North America in terms of the world numbers when it comes to the geographical number count as shown in Chapter 4.8 above, causes the similarity seen between the percentage of public to private universities that facilitate in *Second Life*<sup>TM</sup> in the world compared to North America. Furthermore, this pattern is also visible in Europe. Most of the European universities that

facilitate in *Second Life*<sup>TM</sup> are public universities, namely 26 universities (84%), while five universities (16%) are private universities. The same tendency as in North America and Europe is seen in Australasia, namely 13 universities (93%) are public universities, while only one university (7%), is private. This inclination towards more public universities facilitating in *Second Life*<sup>TM</sup> than private universities, is visible in the developed continents and world.

Contrary to this direction, is what plays out in the developing continents. In Asia, 60% of the universities that facilitate in *Second Life*<sup>TM</sup> are private universities and 40% are public universities. Although this pattern does not follow that of the developed continents, it needs to be noted that the numerical difference between the private universities (3) and public universities (2) on this continent is small. There are only a few universities on this continent that engage in learning facilitation in *Second Life*<sup>TM</sup> compared to the number of universities on the developed continents. In the other developing continent, namely South America, two (67%) of the three universities which facilitate in *Second Life*<sup>TM</sup> are private. Only one (33%) is of public nature. This is similar to Asian universities where there are more private universities that engage in learning facilitation in *Second Life*<sup>TM</sup> than public universities. The described patterns are visible in the infographic in Figure 4.8, showing the developed world with most higher education institutions engaging in learning facilitation in *Second Life*<sup>TM</sup> as public, compared to the focus falling on private universities in the developing continents that are active in *Second Life*<sup>TM</sup>.

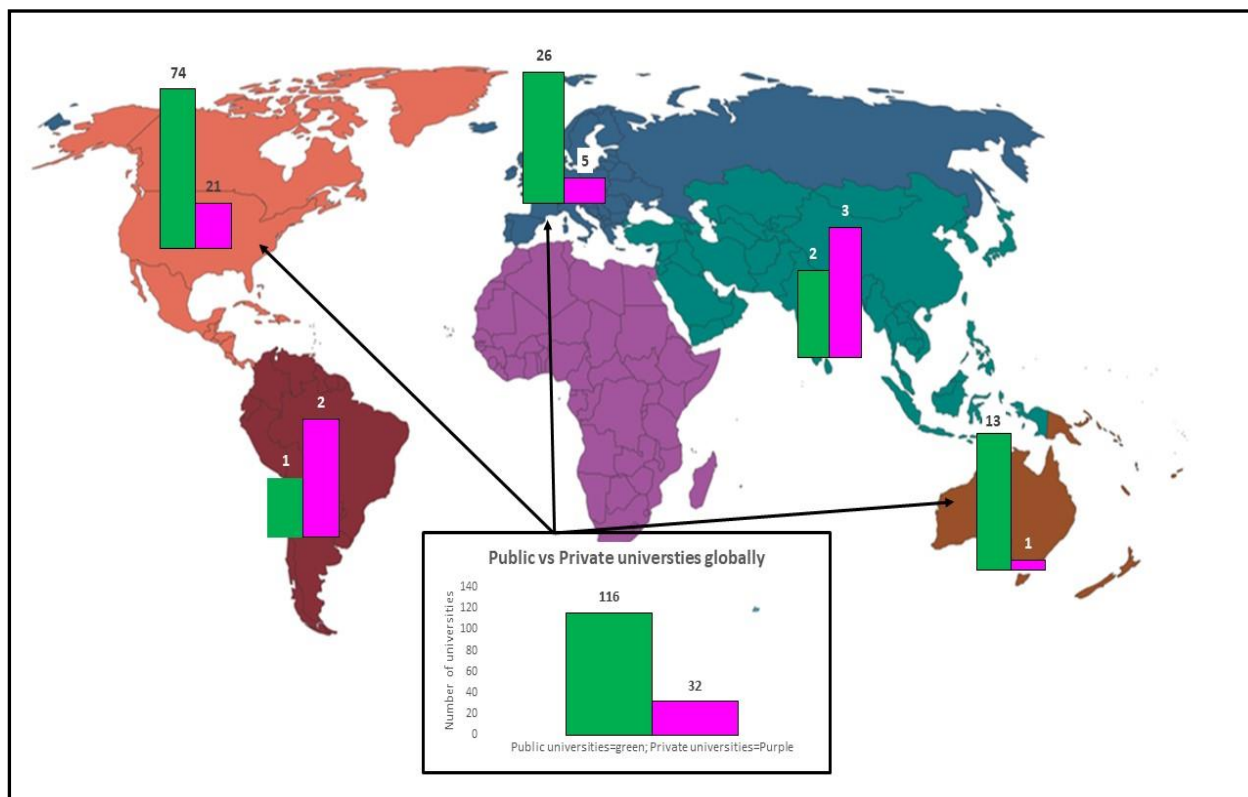


Figure 4.8: Public versus private universities facilitating in Second Life™ globally (Liebenberg, 2022)

The data collected is nominal and with nominal data, the only measure of central tendency is to determine the mode. The nominal data was coded as either a 1 for public universities or a 2 for private universities. The mode was calculated with the statistical MODE.SNGL function in Excel360 as one (1). The central tendency of the nature of independence of global universities that are engaged in learning facilitation in *Second Life™* thus points to public universities in terms of mode.

Nominal data can be evaluated by using statistical methods - especially the Chi-Squared test, which aims to determine if there is a significant difference between the expected and observed frequencies of given numerical values. As seen in Table 4.4, the hypothesis that public and private universities have an equal chance to be observed, is rejected, because the value of the Chi-Squared test is significantly lower than 0,05.

**Table 4.4: Chi-Squared test for public and private universities (Liebenberg, 2022)**

Chi-Squared Test			
Category	Hypothesised proportion	Observed	Expected
Public university	0,5	116	74
Private university	0,5	32	74
<b>Total</b>		<b>148</b>	
Degrees of freedom		1	
Chi-Squared Test		5,02893E-12	

The size of higher education institutions in the world with an active learning facilitation presence in *Second Life*<sup>TM</sup> is discussed hereafter.

### 4.3.3 Size of higher education institutions in the world with an active learning facilitation presence in *Second Life*<sup>TM</sup>

The size of the higher education institutions in the world with an active learning facilitation presence in *Second Life*<sup>TM</sup> is determined in this study by the number of students enrolled at these institutions in 2017. From the 148 universities, the size of 139 could be reliably accounted for. Therefore, descriptive, and inferential statistics are based on the 139 universities only. Table 4.5 presents a summary of the size of universities with an active learning facilitation presence in *Second Life*<sup>TM</sup> for the world, and per continent.

**Table 4.5: The size of universities with an active learning facilitation presence in *Second Life*<sup>TM</sup> per continent (Liebenberg, 2022)**

	Small	Medium	Large	Total
North America	25	58	8	91
Europe	6	19	3	28
Australasia	1	6	6	13
Asia	1	4	0	5
South America	0	1	1	2
Africa	0	0	0	0
Antarctica	0	0	0	0
<b>World</b>	<b>33</b>	<b>88</b>	<b>18</b>	<b>139<sup>27</sup></b>

The majority of the universities with an active learning facilitation presence in *Second Life*<sup>TM</sup> are medium-sized (63%), followed by small-sized (24%) and then large universities

<sup>27</sup> From the 148 universities, the size of these institutions could be reliably accounted for 139 of the universities. Therefore, descriptive and inferential statistics are based on the 139 universities only.

(13%). In North America, most universities which are active in learning facilitation in *Second Life*<sup>™</sup> are medium-sized (64%), followed by small (27%) and large (9%) universities. The large representation of North American universities (65%) in terms of the world total of being active in learning facilitation in *Second Life*<sup>™</sup> has the effect that the world pattern and the North American pattern in terms of university size is similar. The distribution in Europe is the same for North America and the world, with most of the universities of medium size (68%), followed by small (21%) and large universities (11%).

In Australasia, a difference is visible with both medium-sized (46%) and large universities (46%) equally active in learning facilitation in *Second Life*<sup>™</sup>. Small universities are represented as the least (8%) of the total that are active in learning facilitation in *Second Life*<sup>™</sup>. Asia, as a developing continent, follows the pattern of the developed continents, with medium-sized universities leading strongly (80%), followed by small universities (20%). South America shows a similar distribution to Australasia, whereby 50% of universities are of medium size and 50% of large size.

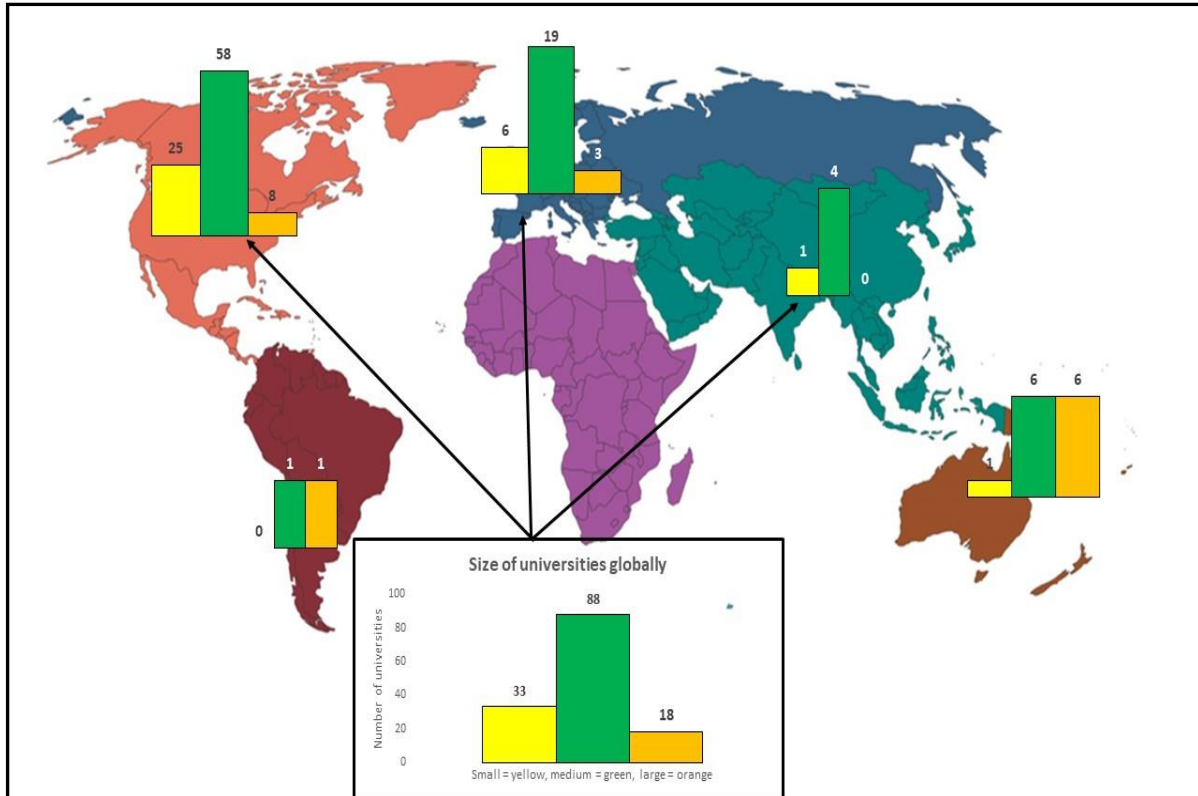


Figure 4.9: Size of higher education institutions that facilitate in Second Life™ (Liebenberg, 2022)

The described patterns above are visible in the infographic in Figure 4.9, showing the similarity of university size globally of universities active in learning facilitation in *Second Life*™. On all the continents, most universities engaging in this domain, or sharing the position with another size category, are medium-sized.

Central tendency is indicated by the mode and the median for ordinal data (small, medium, and large) gathered. Mode implies the number of the values that is repeated most. If the total column is considered within Table 4.5, the mode is 0 for all the sizes of universities if Africa and Antarctica are included. This means that zero representativity occurs the most in the total column of Table 4.5. But the absence of the universities of the African and Antartician continents skews the statistical picture. Therefore, if these contents are excluded, there is no mode, because all the values in the total column appear only once. Again, the mode was calculated with the statistical MODE.SNGL function in Excel360. The median was calculated with the statistical MEDIAN function in Excel360. If the values in Table 4.5 are taken for small-sized universities that engage in learning

facilitation in *Second Life*<sup>™</sup>, the value for the median is 1. This means that 1 is the middle value for small-sized universities that engage in learning facilitation in *Second Life*<sup>™</sup> when the number of these universities per continent is ordered from the smallest to the largest value. Half of the universities will have 1 university or less in the category of small-sized universities facilitating in this domain while the other half of counted universities will have more than one university in the category of small-sized universities facilitating in this domain.

The median was calculated in the same manner for medium-sized and large universities and the values of 6 and 3 were respectively obtained. This median of 6 means that half of the universities will have 6 universities or less in the category of medium-sized universities facilitating in this domain, while the other half of counted universities will have more than six universities in the category of medium-sized universities facilitating in this domain. For large-sized universities, the median of 3 means that half of the universities will have 3 universities or less in the category of large-sized universities facilitating in this domain, while the other half of counted universities will have more than 3 universities in the category of large-sized universities facilitating in this domain.

The range of ordinal data can also be determined, and it is indicative of variability. In this study the range is calculated by:

$$\begin{aligned}
 \text{Range} &= \text{Highest value in the data set} - \text{Lowest value in data set}^{28} \\
 &= 58 - 0 \\
 &= 58
 \end{aligned}$$

The range gives a general indication of how widely scores differ from each other. The range of 58 means that values in this study for the different sized universities will be between 0 and 58. The range also implies that at least one 0 and at least one 58 at the ends of the scale are found in the data set.

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<sup>28</sup>Data set for small-, medium- and large sized universities in Table 4.6

The data gathered, for the three categories of size of universities, is non-parametric ordinal data. Therefore, a Chi-Squared test is performed on this data, as shown in Table 4.6, points out that the possibility and hypothesis for large-, medium- and small-sized universities to have an equal chance to be observed, is rejected. This evaluation is deducted from the value of the Chi-Squared test that is significantly lower than 0,05.

**Table 4.6: Chi-Squared test for public and private universities (Liebenberg, 2022)**

<b>Chi-Squared Test</b>			
<b>Category</b>	<b>Hypothesised proportion</b>	<b>Observed</b>	<b>Expected</b>
Small	0,33	33	46,33
Medium	0,33	88	46,33
Large	0,33	18	46,33
<b>Total</b>		<b>139</b>	
Degrees of freedom		2	
Chi-Squared Test		1,84956E-13	

The classroom design of higher education institutions in the world with an active learning facilitation presence in *Second Life*<sup>™</sup> is discussed hereafter.

#### **4.3.4 Classroom design used in *Second Life*<sup>™</sup>**

The global picture on classroom design of higher education institutions with an active learning facilitation presence in *Second Life*<sup>™</sup> shows a preference towards non-traditional classrooms, namely 45%. Semi-traditional classrooms accounts for 16% of the universities globally, while 39% chose a traditional classroom setting. Table 4.7 summarises the picture for universities globally and the classroom design that they chose for learning facilitation in *Second Life*<sup>™</sup>.

**Table 4.7: Classroom design chosen for learning facilitation in *Second Life*<sup>™</sup> for the world, and per continent (Liebenberg, 2022)**

	Traditional	Semi-Traditional	Non-Traditional	Total
North America	<b>42</b>	<b>17</b>	<b>36</b>	<b>95</b>
	44%	18%	38%	
Europe	<b>10</b>	<b>5</b>	<b>16</b>	<b>31</b>
	32%	16%	52%	
Australasia	<b>3</b>	<b>1</b>	<b>10</b>	<b>14</b>
	21%	7%	72%	
Asia	<b>1</b>	<b>1</b>	<b>3</b>	<b>5</b>
	20%	20%	60%	
South America	<b>1</b>	<b>0</b>	<b>2</b>	<b>3</b>
	33%	0%	67%	
Africa	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
	0%	0%	0%	
Antarctica	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
	0%	0%	0%	
<b>World</b>	<b>57</b>	<b>24</b>	<b>67</b>	<b>148</b>

Contrary to the leniency of the global picture of higher education learning facilitation in *Second Life*<sup>™</sup> towards non-traditional classroom design, the majority of higher education institutions in North America kept the traditional format for their classroom design within *Second Life*<sup>™</sup>. The majority of 44% has a traditional classroom design, followed by 38% with a non-traditional classroom design and 18% with a semi-traditional classroom design. The continent of Europe follows the trend in the world of the majority universities with a non-traditional classroom design (52%), followed by 32% with a traditional classroom design and the remaining 16% with a semi-traditional classroom design. In line with the European tendency, Australasia also prefers a non-traditional classroom design (72%), followed by 21% with a traditional classroom design and 7% represented by a semi-traditional classroom design. Asia follows suit with 60% of institutions preferring a non-traditional classroom design and 20% each follows a traditional and semi-traditional classroom design. South America joins Europe, Australasia, and Asia with their mostly non-traditional classroom design for learning facilitation in *Second Life*<sup>™</sup>. A total 67% of their universities uses a non-traditional classroom design with 33% facilitating in a traditional classroom design. Figure 4.10 offers an overview of choice of classroom design of the universities facilitating in *Second Life*<sup>™</sup>.

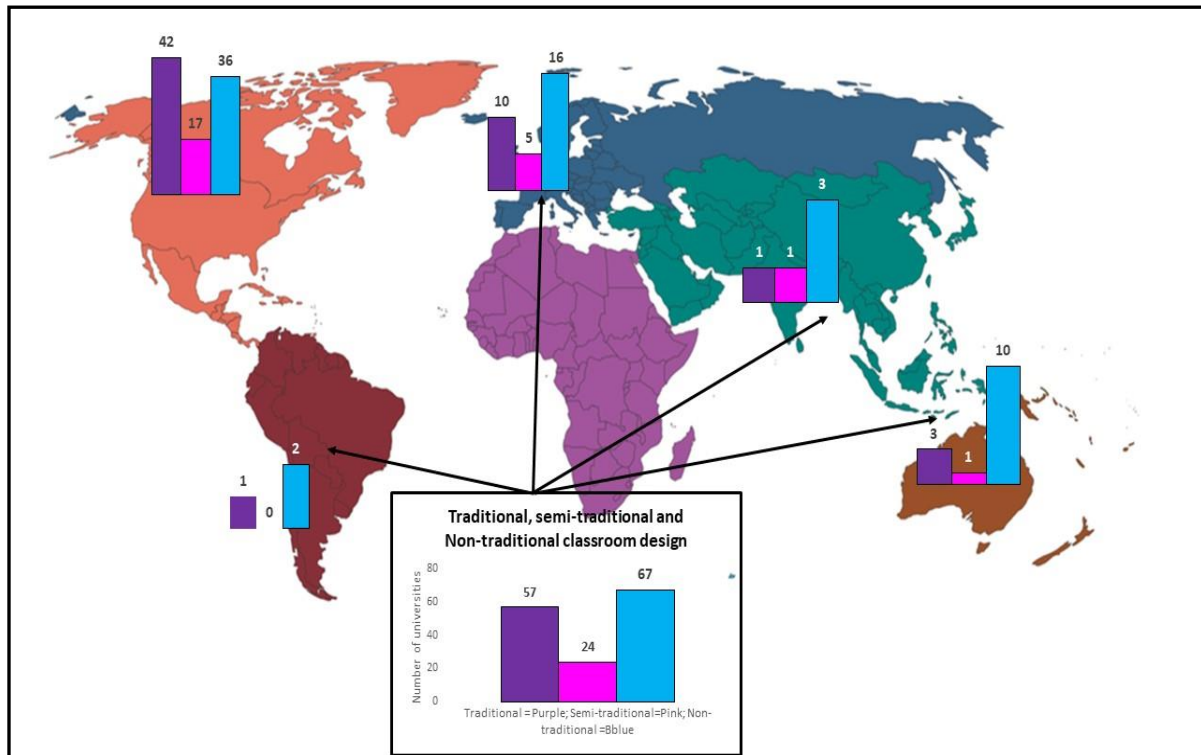


Figure 4.10: Classroom design choice by universities engaging in learning facilitation in *Second Life*<sup>™</sup> (Liebenberg, 2022)

The data collected for classroom design choice is nominal because classroom design is either traditional, or semi-traditional or non-traditional. With nominal data, the only measure of central tendency is to determine the mode. The nominal data for classroom design choice in the world was coded as follows: Traditional = 1, Semi-traditional = 2 and Non-traditional = 3. The mode, as the value that occurs the most, was calculated with Excel360 with the statistical MODE.SNGL function as 3, namely the code for non-traditional classrooms. This result implies that the central tendency in *Second Life*<sup>™</sup>, indicated by the mode, leans towards non-traditional classroom design globally.

As seen in Table 4.8 the hypothesis that traditional, semi-traditional and non-traditional classroom design have an equal chance to be observed, is rejected. This is due to the value of the Chi-Squared test that is significantly lower than 0,05.

**Table 4.8: Chi-Squared test for classroom design choice (Liebenberg, 2022)**

Chi-Squared Test			
Category	Hypothesised proportion	Observed	Expected
Traditional	0,33	57	49,33
Semi-Traditional	0,33	24	49,33
Non-Traditional	0,33	67	49,33
Total		148	
Degrees of freedom		2	
Chi-Squared Test		3,48587E-05	

Qualitative observations were also made by the researcher regarding the classroom design choice of the higher education institutions facilitating in *Second Life*<sup>™</sup>. Figure 4.11 shows examples of the three different classroom design choices categorised for this study. It was observed that the behaviour of students during learning facilitation mirrored



Figure 4.11: Examples of traditional, semi-traditional and non-traditional classroom design of higher education institutions facilitating in *Second Life*<sup>™</sup> (Liebenberg, 2022; Linden Lab, 2022)

the type of classroom design. In the traditional classroom design, students behaved more traditionally and raised their hands before commenting. In the non-traditional classroom design, interaction among the students and presenter flowed in an unstructured way. The communication within the semi-traditional classrooms were less structured than in the traditional classrooms. In the non-traditional classrooms, students also left their seating spaces and sometimes informally co-presented with the facilitator at the front without being asked to move forward. Students engaged more in verbal and non-verbal fashion in the non-traditional and semi-traditional learning facilitation spaces. Noteworthy, with

regard to the behaviour of the learning facilitator, the learning facilitators within the non-traditional classrooms unintentionally stood back and became part of the group of students, rather than bringing a facilitator-centred approach. In the traditional classrooms the facilitators remained in front of the class and students kept seated, as in the real world. Engagement was less than in the semi- and non-traditional classrooms.

The qualitative and quantitative data sets complement each other and data on classroom design. More in-depth knowledge was gained by the triangulation of these two types of data. Hereafter, the subject fields in which learning facilitation take place at higher education institutions in *Second Life*<sup>™</sup> globally are discussed.

#### **4.3.5 Subject fields in which learning facilitation in *Second Life*<sup>™</sup> take place**

All the subject fields that were facilitated at higher education institutions in *Second Life*<sup>™</sup> globally in 2017 were pursued and listed by the researcher for all the universities globally. A comprehensive list of all the data gathered on subject fields or facilitation foci is included as Appendix E and Appendix F, but only the five mostly facilitated subjects per continent and the world are reflected in the descriptive and inferential statistics below. Table 4.9 presents the five most facilitated subject fields per continent. Higher education as a subject is mostly facilitated at higher education institutions in *Second Life*<sup>™</sup> globally. This subject leads with a 16% representation globally, followed by learning facilitation on research with a 15% share in the world. Education is the third most facilitated subject field in *Second Life*<sup>™</sup> globally, with a 14% stake, followed by student services (8%) and medicine (7%).

Table 4.9: Subject fields mostly facilitated in *Second Life*<sup>™</sup> (Liebenberg, 2022)

Geographical area	Subject field	Frequency	Percentage
World	[1] Higher Education	24	16
	[2] Research	23	15
	[3] Education	21	14
	[4] Student Services	12	8
	[5] Medicine	10	7
North America	[1] Higher Education	20	21
	[2] Research	18	19
	[3] Education	11	12
	[4] Student Services & Sciences	9	10
	[5] Medicine & Mathematics	7	7
Europe	[1] Education	4	14
	[2] Research and Student Services	3	11
	[3] Higher Education, history, psychology & language	2	7
Australasia	[1] Education	5	38
	[2] Higher Education	4	31
	[3] Architecture, business, Chinese studies & Medicine	2	15
Asia	[1] Oceanography and earth studies		
South America	Business, management, teaching and learning, intercultural competence, engineering, and mechanics.		

North America influences the preference as seen for the world because of its majority representation in the world. In North America, the majority of subject fields that are facilitated are higher education leading with 21%, followed by research (19%), education (12%), both student services and sciences (10%) as well as the two subject fields medicine and mathematics equally represented (7%). At European universities, education (14%) is the leading subject facilitated at universities engaged in *Second Life*<sup>™</sup>. Research and student services are in the second place with 11% representation each. The third place is shared amongst four subject fields, namely higher education, history, psychology, and language with a 7% share each. A similar trend to Europe is seen with Australasia. The learning facilitation subject field focus points towards education (38%). This is followed by higher education and art with an equal share of 31%.

Thirdly ranked are architecture, business, Chinese studies, and medicine with a 15% representation. With only a few Asian universities present in *Second Life*<sup>TM</sup>, only one facilitation focus group is singled out, namely oceanography and earth studies. The rest of the subjects are presented per one institution only and do not form a significant aggregate. The paucity of universities facilitating in *Second Life*<sup>TM</sup> in South America means that aggregate facilitation foci cannot be identified with significance. Subject field foci are scattered, and some examples are business, management, teaching and learning, intercultural competence, engineering and mechanics. By means of WordCloud.com (2022) the qualitative responses were used to create a word cloud of the most facilitated subjects in Figure 4.12 below.

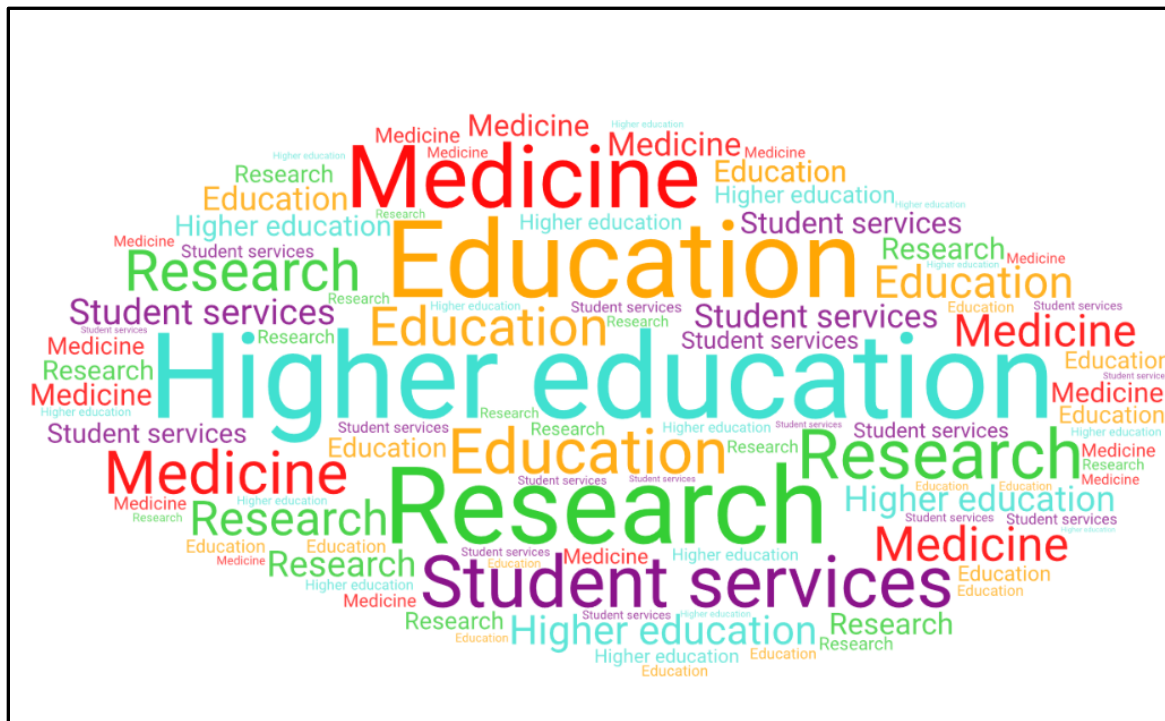


Figure 4.12: Word Cloud of facilitation foci in *Second Life*<sup>TM</sup> globally (Liebenberg, 2022)

The data collected for the fields of facilitation foci in higher education learning facilitation in *Second Life*<sup>TM</sup> is nominal, for which the only measure of central tendency is to determine the mode. A separate number was allocated for each subject field used during learning facilitation. Each subject field was coded with a number, for example art was coded as 1, psychology as 2, history as 3, research as 12, education as 25 and higher

education as 27. The mode, as the value that occurs the most, was calculated with the statistical MODE.MULT function in Excel360. One mode was retrieved as 27, which equates to higher education. This implies that the central tendency leans towards higher education as most frequently facilitated subject field globally in *Second Life*<sup>TM</sup>. Hereafter the facilitation methods used during learning facilitation at higher education institutions in *Second Life*<sup>TM</sup> are discussed.

#### **4.3.6 Facilitation methods used during learning facilitation in *Second Life*<sup>TM</sup>**

The facilitation methods used most by universities engaging in *Second Life*<sup>TM</sup> globally is classroom lecturing similar to real life traditional classroom facilitation, with a 30% share in terms of facilitation methods. The leader in facilitation methods is followed by collaboration (20%), exhibitions (19%), creation of artefacts or ideas (15%) and library visits (14%). Table 4.10 shows the facilitation methods used most in the world during learning facilitation in *Second Life*<sup>TM</sup>, as well as per continent. A visual representation of the facilitation methods as used the most globally can be seen in Figure 4.10.

**Table 4.10: Facilitation methods used for learning facilitation in *Second Life*<sup>TM</sup> (Liebenberg, 2022)**

Geographical area	Facilitation method	Frequency	Percentage
World	[1] Classroom facilitation	44	30
	[2] Collaboration	30	20
	[3] Exhibitions	29	19
	[4] Creation of artefacts and ideas	22	15
	[5] Library visits	20	14
North America	[1] Classroom facilitation	27	28
	[2] Collaboration & Simulations	18	19
	[3] Exhibitions	16	17
	[4] Creation of artefacts and ideas	14	15
	[5] Library visits	13	14
Europe	[1] Classroom facilitation	9	29
	[2] Simulation	7	23
	[3] Collaboration	6	19
	[4] Discussions, visits to places and library visits	5	16
Australasia	[1] Exhibitions	6	43
	[2] Classroom facilitation	5	36
	[3] Discussion groups & collaboration	4	29
Asia	[1] Exhibitions, scenarios & simulations	3	60
	[2] Classroom facilitation & exploration	2	40
South America	Simulation, demonstrations, exhibitions, design, questionnaires, critical incidents, classroom facilitation, exploration, events, and research.		

In accordance with the world, classroom facilitation leads in North America with 28%, followed by collaboration and simulations with 19% each. Exhibitions are used by 17% of the universities, creation of artefacts or ideas by 15% and library visits by 14%. Europe shows a very similar pattern to the world and North America of facilitation methods used, namely classroom facilitation leading the way with 29%. The second-most used facilitation method is simulation (23%), followed by collaboration (19%). Discussions, visits to places and library visits are represented with 16% use for each of the facilitation methods. Australasia is similar with exhibitions leading by 43%, followed by classroom facilitation used by 36% of universities on this continent. Discussions and collaboration

are both used in 29% of the cases in Australasia. In the developing world, although underrepresented in number to the global universities engaged in learning facilitation in *Second Life*<sup>TM</sup>, most learning facilitation methods in Asia pointed to exhibitions, scenarios, and simulations. These facilitation methods were each used by 60% of the universities. They were followed by classroom facilitation, exploration, and collaboration, which were used by 40% of the higher education institutions. Because of the limited operational activity of South American universities in *Second Life*<sup>TM</sup>, there is no facilitation method that explicitly comes to the fore on this continent. Some examples observed are simulation, demonstrations, exhibitions, design, questionnaires, critical incidents, classroom facilitation, exploration, events, and research. See the top five facilitation methods used by universities in the world in Figure 4.13.

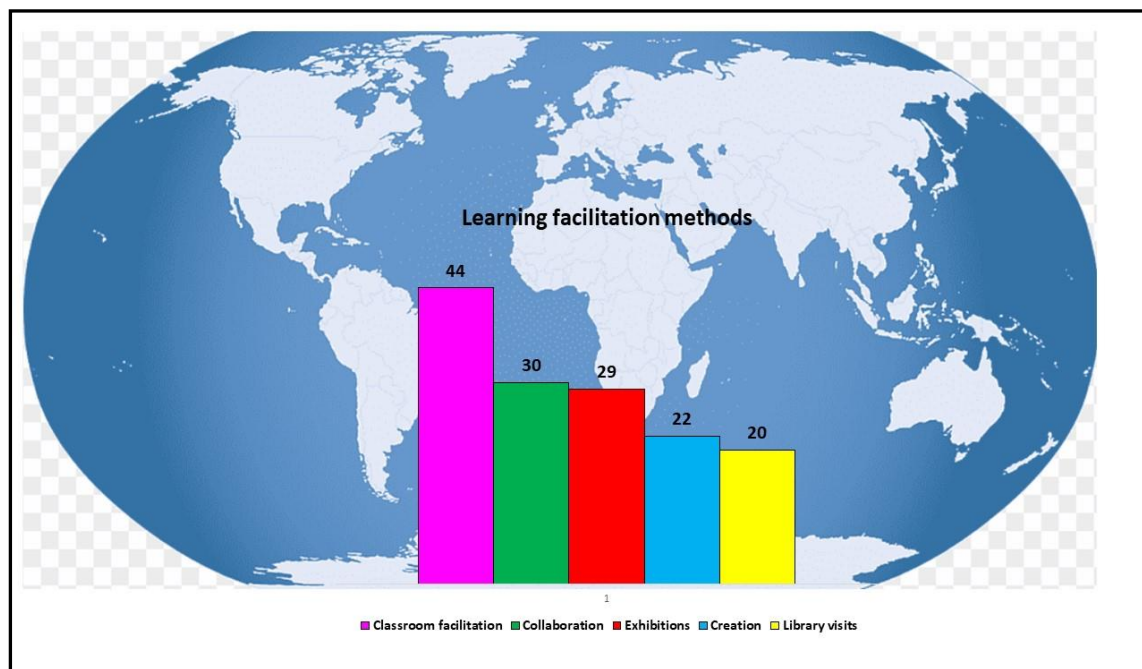


Figure 4.13: Top five facilitation methods used by universities in the world when facilitating in *Second Life*<sup>TM</sup> (Liebenberg, 2020)

The data collected for facilitation methods is nominal, for which the only measure of central tendency is usually used to determine the mode. A number was allocated for each subject method used during learning facilitation globally. For example, classroom facilitation was coded as 1, simulation as 2, library visits as 3, until all the learning facilitation methods were numbered. The mode was calculated with the statistical

MODE.MULT function in Excel360 as 1. This implies that the central tendency of facilitation methods globally leans towards classroom facilitation as most frequently used in *Second Life*<sup>TM</sup>.

Based on the information gathered by quantitative and qualitative observation and described in section 4.8 until section 4.13, a typical higher education institution that facilitates in *Second Life*<sup>TM</sup> in the world is in North America, of public nature, medium-sized with a non-traditional classroom design, facilitating on the subject field of higher education by means of a classroom facilitation method. An example of each of these key features at higher education institutions that engage in learning facilitation in *Second Life*<sup>TM</sup> in the world, was pursued inworld. These explored key features at universities are discussed in section 4.4 hereafter.

#### **4.4 Examples of key features of typical higher education institutions globally with an active learning facilitation presence in *Second Life*<sup>TM</sup>**

A typical higher education institution is defined as delivering tertiary qualifications in a variety of subject fields. These institutions are either public or privately funded and created spaces where learning facilitation take place. They have different sizes, depending on their student enrolment numbers (IGI Global, 2022; World Bank, 2022). A typical higher education institution with an active learning facilitation presence in *Second Life*<sup>TM</sup> is located in North America. One example of a university with an active learning facilitation presence in *Second Life*<sup>TM</sup> located in North America is the Texas Wesleyan University in Texas. In Figure 4.14 an impression is given of what the university learning facilitation setting looks like in real-life, compared to what it does in *Second Life*<sup>TM</sup>. In real-life, the classrooms are typical brick-and-mortar classrooms, shaped by the rectangular walls of the buildings. But in *Second Life*<sup>TM</sup>, there are no walls for the learning space. There is no rectangular structure, and circles of movement and flexibility are present in the Chromosome Café of the Texas Wesleyan University inworld. In the *Second Life*<sup>TM</sup> classroom settings, chromosomes become the real-life since they are surrounding the students. There is a vast difference in effect if chromosomes are discussed on a

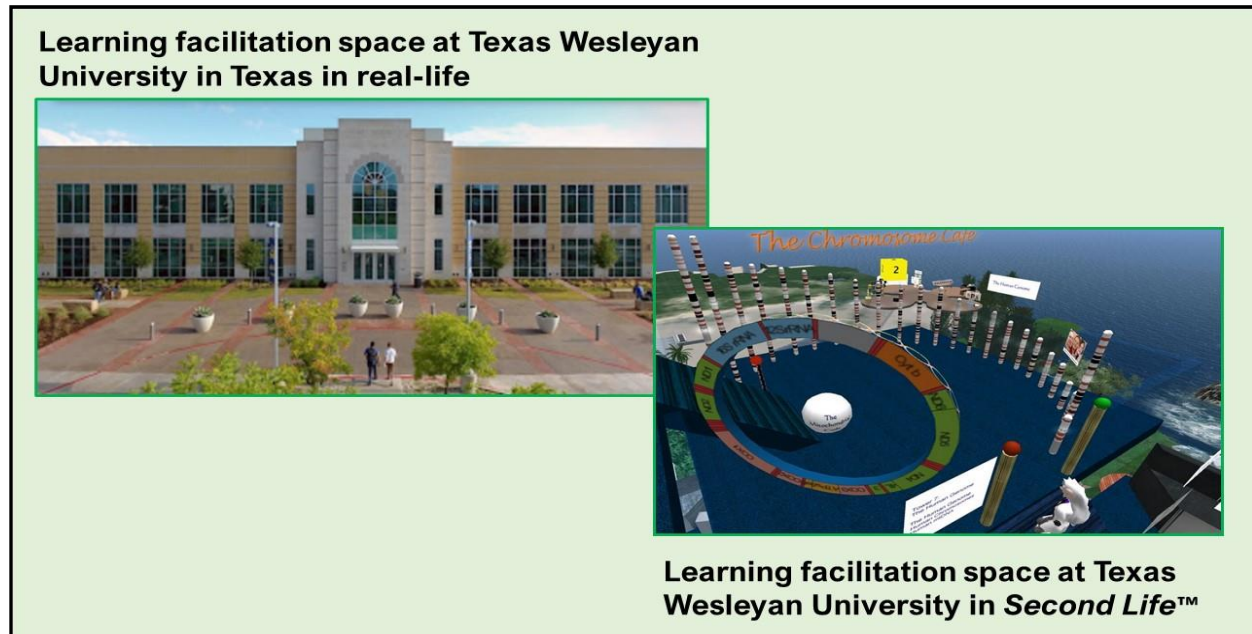


Figure 4.14: Real-life and Second Life™ representation of learning facilitation space at the Texas Wesleyan University in Texas (Texas Wesleyan University, 2022; Linden Lab, 2020)

PowerPoint in a rectangular real-life setting compared to a *Second Life*™ learning facilitation setting where genetics and chromosomes are the horizon and the pillars that overlooks an ocean. This latter setting links to the advantages discussed regarding learning facilitation in *Second Life*™ in Chapter 2, namely learning facilitation in this world engages and entices students of the Millennial generation, as well as Generation Z. It stimulates learning in the end. Where chromosomes are only visible under a microscope in real-life, students can walk in chromosomes in this learning facilitation space, and the reorganisation of genetic material is also possible here.

A parallel was observed by the researcher between the real-life geographical outlines surrounding the Texas Wesleyan University in Texas and the geographical representation of this university in *Second Life*<sup>™</sup>. The coastline in *Second Life*<sup>™</sup> where the Chromosome Café is situated resembles the contours of Lake Arlington next to the Texas Wesleyan University in real-life. See the parallel indicated by the researcher in Figure 4.15.

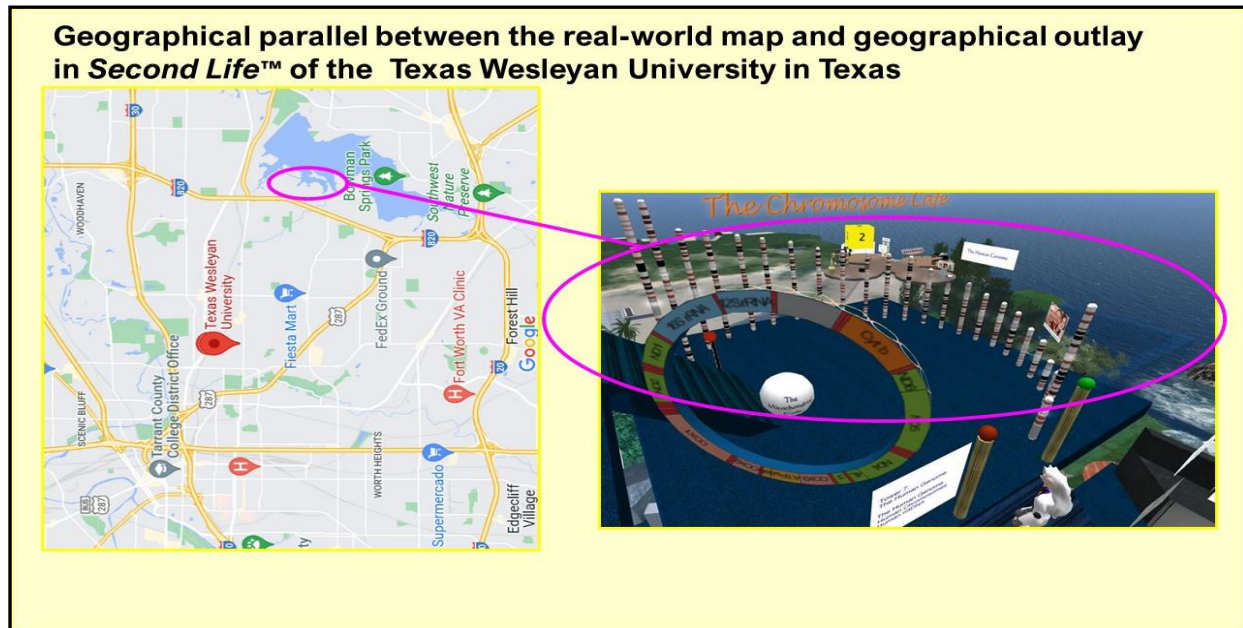


Figure 4.15: Geographical parallel (Texas Wesleyan University, 2022; Linden Lab, 2020)

Furthermore, as indicated above, a typical higher education institution with an active learning facilitation presence in *Second Life*<sup>™</sup> is public of nature. One example of a such a university in *Second Life*<sup>™</sup> is the University of Ulster Northern Ireland in Europe. This public university in Northern Island has four campuses in real-life and one in *Second Life*<sup>™</sup>. Figure 4.16 provides a collage of the real-life and *Second Life*<sup>™</sup> campuses and their learning facilitation spaces. In this learning facilitation example, the focus of the facilitation falls on robotics. Hardware integration demonstrations of robotics are exhibited in the learning facilitation space. *Second Life*<sup>™</sup> enables each student to engage in hands-on mechanics of robots and the creation of technology on site without the huge costs for public universities to introduce students individually to expensive parts and assembling of robotics.



Figure 4.16: Real-life and Second Life™ campuses of a public university, Ulster University in Northern Ireland (Ulster University, 2022; Linden Lab, 2020)

Globally, a huge decline in public funding towards universities is of concern for this sector and its sustainability (Tilak, 2021). But, public universities, which are represented the most in *Second Life*™, must use the knowledge gained in this domain when confronted by public funding constraints. Because of the financial challenges experienced by public universities, these universities could use the opportunities of lessons learned during *Second Life*™ learning facilitation to assist them in rethinking and reshaping the construction, maintenance, and travel costs of learning facilitation.

Linked to this, a typical higher education institution that facilitates in *Second Life*™ in the world is medium-sized. One example of a university that is active in *Second Life*™ and medium of size is the Chichlee University of Technology in Taiwan in Asia, with more than 10,000 registered students. Figure 4.17 shows the ReWun building to the left where foreign languages are studied, such as English. The picture to the right in Figure 4.17 is where foreign languages are studied in *Second Life*™ on its campus in this domain. Similar to the two contrasting environments in the figure below are the strict lines and structure of the learning facilitation settings. The advantage of the learning facilitation space in *Second Life*™ is that there is an open space with an ocean behind the mainly white set classroom structure. This open space may provoke and render the opportunity

to students to reflect on their learning. The classroom facilitation setting in *Second Life*<sup>™</sup> also affords interaction, which is a very important element when acquiring a new language. The interpersonal openness inclination of this medium-sized university's semi-traditional learning facilitation space, where a fixed structure is used for grammatical



Figure 4.17: Real-life and *Second Life*<sup>™</sup> representation of a medium-sized university, namely the Chihlee University of Technology in Taiwan (Chichlee University, 2022; Linden Lab, 2022)

display, constitutes a combination that is conducive to learning. This is perceived to be especially true for Millennials and Generation Z.

Moreover, a typical higher education that facilitates in *Second Life*<sup>™</sup> prefers a non-traditional classroom design. One example is the Curtin University in Perth in Western Australia. This university also has campuses in Dubai, Malaysia, Mauritius, and Singapore. Traditional buildings of the Curtin University are seen in real-life in Figure 4.18 with a glimpse of the non-traditional as visible on the lawn design to the left bottom corner. But the *Second Life*<sup>™</sup> learning facilitation space to the right side of Figure 4.18 is a clear example of a non-traditional learning facilitation space. No walls are visible; chemistry quizzes are in a box; different chemical metals are pinned to a box where a facilitator would have traditionally stood. There is a veranda for recreation and interaction next to the ocean. There are thermodynamics and colligative property solutions in pencil-like containers. All these artefacts are non-traditional and situated randomly in an open space. The environment is colourful and relaxed. It engages the Millennial students and Generation Z, and eventually stimulating learning. It further leads the students to explore

the content of chemical boxes, to action their own learning and to debate and discuss the chemistry at hand. The non-traditional classroom design also often impacts on the preferred facilitation method, which is discussed hereafter. A learning facilitator standing in the front of the non-traditional class in *Second Life*<sup>™</sup> as portrayed in Figure 4.18, trying to disseminate knowledge, will feel at odds for Millennials and Generation Z students and this type of classroom design.



Figure 4.18: Real-life and *Second Life*<sup>™</sup> representation of a university engaging in learning facilitation in a non-traditional classroom design, namely the Curtin University in Perth in Australia (Curtin University, 2022; Linden Lab, 2022).

Additionally, a typical higher education that facilitates in *Second Life*<sup>™</sup> in the world is facilitating on the subject field of higher education. In Figure 4.19, Jass Easterman (aka Sue Gregory in real life) is facilitating a class on higher education at the University of New England in Armidale in New South Wales in Australia. Some students in this picture of a learning facilitation chose avatars of cats and owls to represent them, while other students selected more humanlike avatars for their personas in *Second Life*<sup>™</sup>. Jass Easterman, when facilitating her teacher education students insisted that her students had human avatars when in class.

The real-life campus of the University of New England is surrounded by numbers of trees, as seen in Figure 4.19. Correspondingly, the *Second Life*<sup>™</sup> campus of this university, where the learning facilitation session on higher education takes place, as visible in the bottom right corner of the figure, also overlooks large trees outside. The growth

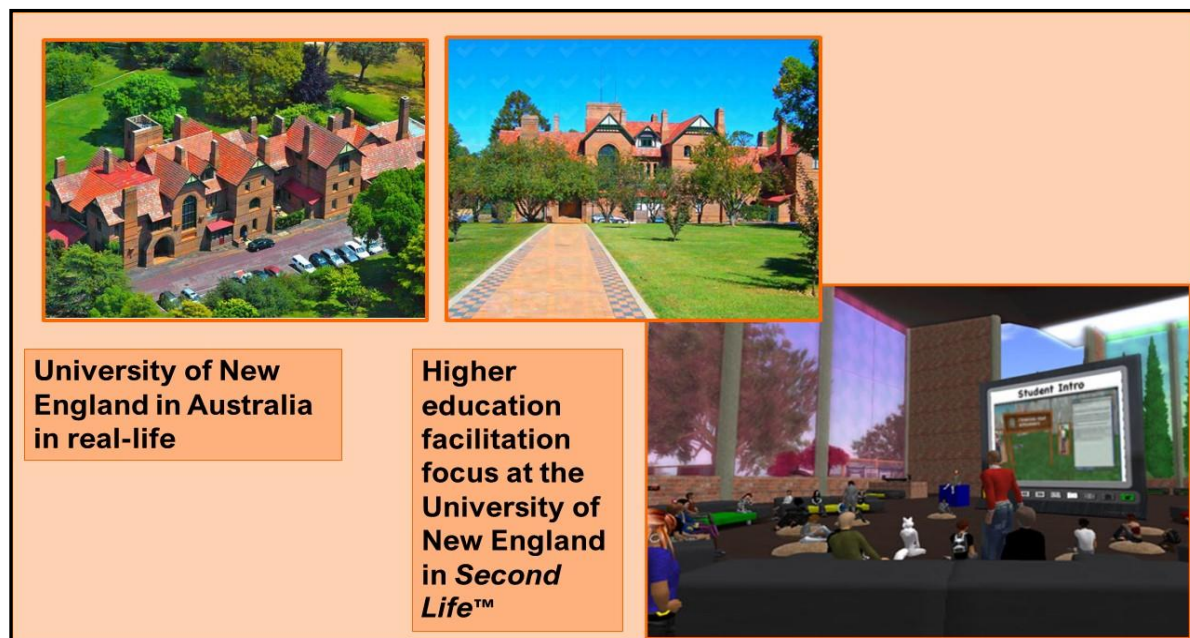


Figure 4.19: Learning facilitation with a higher education focus at the University of New England in Australia (University of New England, 2022; Linden Lab, 2020)

associated with trees, symbolises the growth that learning facilitation on higher education initiates. The length of the trees also shows towards the higher and advanced dimensions of education, namely higher education.

Higher education institutions that facilitate in *Second Life*<sup>™</sup> were shown to typically facilitate by means of traditional classroom facilitation methods, although in non-traditional learning facilitation spaces. In Figure 4.20 classroom facilitation is used in a class for hospitality management and dietetics at the Kansas University in Manhattan in North America. In real-life, this university has four campuses, namely a Manhattan, Olathe, Salina, and Global Campus. The Salina campus and the *Second Life*<sup>™</sup> campus resemble one another with the set classroom style between the walls. Furthermore, both campuses have a majority of grey and white colouring interior and exterior. With these physical structures, classroom facilitation as method of facilitation is expected, and it is often seen as paired.

The high prevalence of traditional facilitation methods used when higher education learning facilitation takes place in *Second Life*<sup>™</sup> shows that the majority of learning facilitators have not yet made the mind-shift that the learning facilitation methods inworld must not be a replication of the real world if deep learning is sought. Furthermore, it shows



Figure 4.20: Classroom facilitation used as method of facilitation at the Kansas University in North America (Kansas University, 2022; Linden Lab, 2020)

that the set-up of learning facilitation spaces in *Second Life*<sup>™</sup> still receive more attention in research than the developing of theory on deep learning facilitation practices inworld.

In the next chapter, a higher education learning facilitation space in *Second Life*<sup>™</sup> was created for the University of the Free State in Africa with the key features of a typical higher education that facilitates in *Second Life*<sup>™</sup> in the world kept in mind. Three key features of the created learning facilitation space in *Second Life*<sup>™</sup> for the University of the Free State is similar to a typical university that facilitates in *Second Life*<sup>™</sup> in the world, namely this university is public in nature, medium-sized and a classroom facilitation method was used. Three of the key features of this university differs from the typical university in the world, because it is located in Africa (compared to North America), the created learning space has a traditional classroom design (compared to the non-

traditional classroom design) and English literacy (compared to higher education) was facilitated as subject field.

## **4.5 Ethical considerations**

The Ethics Committee of the Faculty of Education at the UFS granted ethical clearance for this research (See Appendix A). The study was conducted in line with the ethical requirements of the UFS. The checklists of Patton (2003) and UK Research and Innovation (2021) on ethical issues was used in this study. During the process of data analysis, unfavourable data were not discarded and no modification of the interpretation of results was allowed (Brown, Kaiser & Allison, 2018). Appropriate credit was given to all universities whose documents were used in the process of content analysis. This study also placed scientific objectivity above personal advantage and recognised the obligation towards society to advance knowledge.

## **4.6 Quality assurance of the study**

The quality assurance of this study is based on its validity and reliability, which are key to effective research. Research needs to be valid to be of value. Previously validity was demarcated just to research that measures what it is supposed to measure. But validity is more than this demarcation. With qualitative data, validity is also addressed by means of depth, honesty, richness of data, the extent of triangulation and the degree of objectivity of the researcher. Credibility is the product of triangulation, because participants or phenomena are evaluated from different angles by means of different data collection and analysis methods. Triangulation validates, deepens, and widens the understanding of the research phenomenon being studied. Quantitative validity is improved by careful sampling, using an appropriate instrument together with statistical validity testing (Cohen, et al., 2017).

The external validity or transferability of the population in this chapter is strong, since the sample used equalled the population. Generalisation is thus possible without statistical error in terms of this population. Dependability rests on the data gathered from two angles,

namely the qualitative and quantitative. Quantitative data seen in Table 4.11, validated by the Pearson's correlation coefficient, enhanced the qualitative perspectives, and brought a more holistic picture as response to the second research questions in the study. The R value for the Pearson's correlation between the size of universities globally and their classroom design type was calculated by the statistical PEARSON function with Excel360 as -0.999.

**Table 4.11: Classroom design and size variables tested with the Pearson's correlation coefficient**

Classroom design	Size		
Traditional	57	33	Small
Semi-traditional	24	88	Medium
Non-traditional	67	18	Large

This implies that the two variables of size and classroom design is not correlated and tends to move in the opposite direction of the other. Content validity (in which the questions are answered to the target without excluding important points) and internal validity (in which the questions raised answer the outcomes of researchers' target) are present in this study.

Reliability was ensured by the qualitative and quantitative research approaches that were considered independent from another. These data sets were integrated with the interpretation of the data. Data was validated after each type of data gathering process during the data collection phase by means of data type, range, and consistency. Quantitative data was validated by a Chi Square Test, testing for internal consistency. This study is deemed credible. The reason is that although qualitative research does not attempt to generalise findings because of relatively small sample sizes, transferability is applicable.

Dependability relies on a comprehensive data set. Sufficient details and information need to be gathered. In this study, the appendices contain large data sets. Substantial quantities of data were gathered in this study. Confirmability is also present since other

researchers should be able to replicate the results of this explorative study if they repeat a similar exploration. The data methods in this study are described in a transparent way for any other researchers to replicate. Therefore, this research carries the necessary confirmability. It is believed that the measures used will capture the same concept consistently over time, produce similar results in different contexts and questions measure the concept of learning.

## 4.7 Conclusion

In this chapter, the second research question: What are the key features of the landscape associated with learning facilitation in *Second Life*<sup>TM</sup> classrooms at higher education institutions globally? was explored, complementary to the preceding literature review. The explorative research design and content analysis methodology, the demarcation of the population and choice of census sampling were all aligned to answer this research question. Based on the data collection, primary data sources, the consideration of ethical principles and quality assurance, an image of a typical higher education institution that facilitates in *Second Life*<sup>TM</sup> in the world was compiled. Key features of a typical university globally are that it is located in North America, public of nature, medium-sized, using learning spaces with a non-traditional classroom design, and most probably facilitating on the subject field of higher education by means of a traditional classroom facilitation method.

The data that was gathered and analysed is meaningful for researchers and decision-makers, particularly at African higher education institutions, because this is the continent where *Second Life*<sup>TM</sup> higher education learning facilitation still needs to be implemented. Africa, still absent, on the geographical representation, thus needs information from within this continent to make the implementation viable and meaningful to students from Africa. Most importantly, the implementation of learning facilitation in *Second Life*<sup>TM</sup> on this continent needs to support deep learning. The predominance of public universities engaging in learning facilitation in this domain globally shows that these initiatives do not need to be driven by private universities. This is also true for developing continents. Therefore, the University of the Free state as a public university can benchmark from

other public universities globally. Furthermore, to involve the National Department of Higher Education, the University of the Free State can also apply for a special University Capacity Development Grant project to develop such a learning space and eventually benefit the developing country and continent with knowledge acquired.

From the content analysis, showing that this learning facilitation is mostly happening at medium-sized universities, this also carries the message for this university that the potential of learning in this domain can be managed by medium-sized universities. The University of the Free State is also a medium-sized higher education institution. Again, benchmarking with other medium-sized universities is possible. A medium-sized university has the possibility of scale with the implementation of learning facilitation in *Second Life*<sup>™</sup>, where a difference in learning could become visible in the communities of the Free State and South Africa. Scalability by means of a medium-sized university is an ideal systemic stance of departure to implement learning facilitation (Kilfoil, 2021). Large universities can learn from scalability lessons from medium-sized universities, while small universities do not have the scalable numbers. Therefore, this medium-sized university is seen as favourable to investigate learning facilitation in *Second Life*<sup>™</sup> on the developing continent of Africa.

Although there are subject fields that are highlighted by the content analysis as being facilitated more often, such as higher education, research and education, a variety is seen globally in terms of the subject fields that are facilitated. Subject fields that are facilitated in *Second Life*<sup>™</sup> globally also stretches from medicine, language development, law to robotics. Therefore, the subject field for implementation has been shown by the higher education institutions of the world to be open and flexible. In terms of the predominant learning facilitation methods practiced by higher education institutions in the world in *Second Life*<sup>™</sup> there is a visible gap between what the literature proposes and what is being practised. Traditional lecturing in virtual classes is often happening rather than debate and discussions after simulations and experimentations. Therefore, this small-scale project created for learning facilitation by the University of the Free State in *Second Life*<sup>™</sup> made use of a variety of facilitation methods. Traditional lecturing was also

included, but videos and discussions and debate were also added. The learning facilitation situated in *Second Life*<sup>™</sup> also present a degree of freedom to facilitators during facilitation in not being bound by static walls and geographical limitations. There are creative avenues of learning facilitation methods that can be explored, contributing to the academic freedom of higher education.

In the following chapter, the research process from research design to interpretation of results, will be followed to answer to the third research question of this study, with the objective to explore the students' learning experience at an African university through the creation of a small-scale project of learning facilitation in *Second Life*<sup>™</sup>.

# CHAPTER 5

## CREATING AND EXPLORING THE LEARNING FACILITATION EXPERIENCE IN A *SECOND LIFE*<sup>TM</sup> CLASSROOM

### 5.1 Introduction

The adapted theoretical framework in Chapter 2, and the exploration of the higher education learning facilitation landscape globally in *Second Life*<sup>TM</sup> by means of the non-empirical research in Chapter 3 and the empirical research of content analysis in Chapter 4 are used as foundation for the continuation of this study in Chapter 5. This chapter investigates the third research question: What is the learning experience of students in a *Second Life*<sup>TM</sup> classroom at an African University?

A small-scale project on the learning experience of learning facilitation in *Second Life*<sup>TM</sup> at an African university was created to understand the learning experience better and deeply. This small-scale project laid the foundation for developing markers to reshape higher education learning facilitation in a developing continent through *Second Life*<sup>TM</sup>. These markers may serve as basis for decision-makers at African universities if they want to explore the avenue of learning facilitation in *Second Life*<sup>TM</sup>. From the information collected; opportunities can open for African higher education institutions to also facilitate in this domain based on scientific underpinnings of research from within Africa. This may also enhance deep learning for the students of these institutions and in Africa. Furthermore, the specific employment of Action Learning Action Research, with its essence to develop and better practice, was conducive to improving learning facilitation practice and understanding of the complexity of this type of learning facilitation, at higher education institutions in Africa. By means of this Action Learning Action Research, the current context of higher education learning facilitation in Africa can be improved and the higher education sector of this continent can become competitive in *Second Life*<sup>TM</sup>. The

acquired insights from Action Learning Action Research only occurred while the research was ongoing, which led to practical improvements recorded during the undertaken study. Another contribution from the Action Learning Action Research was that the results thereof are not merely theoretical, but practically implementable - as was the case of the small-scale project of learning facilitation at the University of the Free State.

As in Chapter 4, this chapter commences with the research design and methodology relevant to the mentioned research question. In these sections, the research population, the selection of a sample, the data sources and the methods of data collection are explained. The guiding Figure 5.1, highlighting the applicable part to this chapter within the overall study plan, shows that the gathered data was analysed by a multimethod strategy and methods to include the qualitative and quantitative, and thereafter interpreted. Subsequently, the interpreted data is presented.

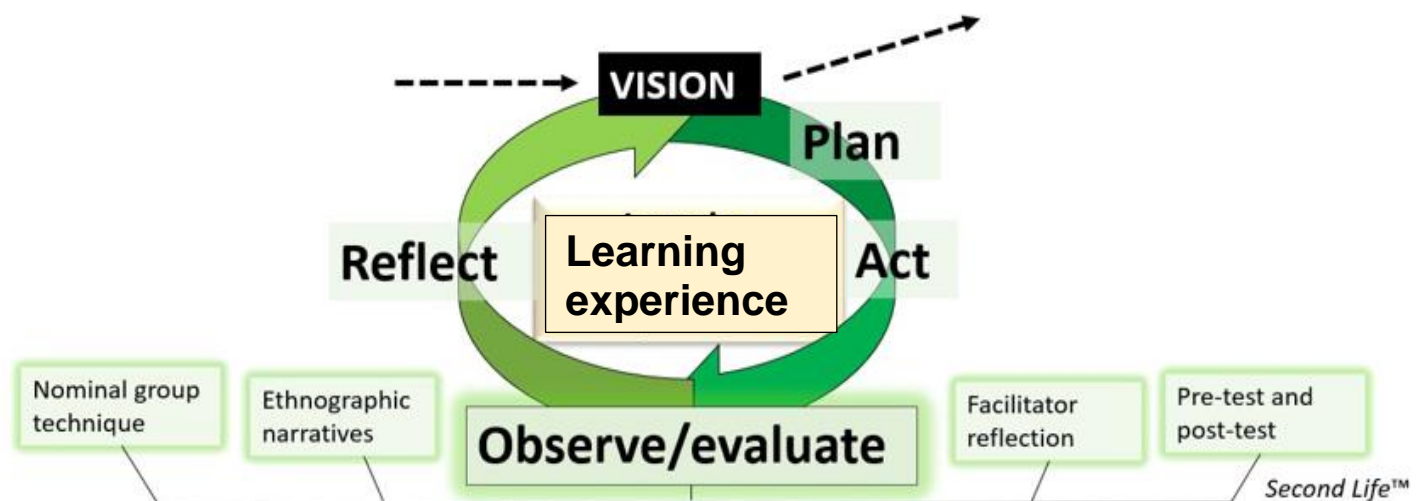


Figure 5.1 Exploration of higher education learning facilitation in Second Life™ (Liebenberg, 2022)

The reason for presenting the research design and methodology as well as data analysis in one chapter is for the sake of clarity, because each research question in this study has a different research design and methodology, with consequential data analysis and interpretation. Ethical considerations are described after the presentation of the interpreted data, and quality assurance concludes the chapter.

## 5.2 Research design and methodology

This part of the study relies on a cross-sectional exploration of the creation of a classroom in *Second Life*<sup>™</sup> for the University of the Free State, which means that the study took place at a particular point in time, namely in 2017. This study is not longitudinal, whereby the study is undertaken over a period (Creswell & Creswell, 2018). An adapted action research-guided design and methodology guided this part of the study. The Action Learning Action Research cycle progressed from planning (see section 5.4), action and creation (see section 5.5), data collection in various forms (see section 5.7 and 5.8) to reflection upon the analysed data (see section 5.8). These cycles led to comprehension of the learning facilitation experience from an African perspective, linked to the African Theory of Knowledge. This understanding is directly relevant to higher education practice in Africa, which led to Grounded Theory (see Chapter 6) with the development of markers to reshape this sector in Africa. Because there are no hidden controls with Action Learning Action Research, the direction of the analysed results was not pre-empted, but developed with the learning and the research. The line of this study was just followed as it evolved from the Adapted Virtual World Adjustment Theory in Chapter 2, with the linked theories of The African Theory of Knowledge, Ethnographical Theory and Grounded Theory towards the literature review exploration in Chapter 3 as part of the non-empirical research. This led to the empirical research in Chapter 4 with the multi-method strategy to explore the key features in *Second Life*<sup>™</sup> of the higher education landscape in learning facilitation in globally, eventually forming the foundation for Chapter 5 wherein Action Learning Action Research was carried out based on the preceding chapters. The direction of this study thus evolved without set ideas and hidden controls by the researcher.

Action Learning Action Research in this chapter followed a qualitative and quantitative multi-method research approach since this type of research design is not exclusive to either the one or the other of the mentioned research approaches. This research design follows what the researcher does, irrespective of the qualitative or quantitative nature thereof. The qualitative research approach component of this chapter aimed to comprehend and interpret learning experiences and intangible issues to obtain in-depth knowledge of the learning experience of students and facilitators in Africa in the context of higher education learning facilitation in *Second Life*<sup>TM</sup>. This was actioned by means of performing a nominal group discussion, doing observations, requesting students to write ethnographical narratives, and soliciting reflections from the students and the learning facilitator after the learning facilitation took place. The researcher was also involved during the creation of the learning facilitation space, the registration of avatars and part of each of the learning facilitation sessions. In this way, the researcher gained first-hand experience and was in a favourable position to identify patterns and themes emerging as the research evolved.

The quantitative research approach segment of this chapter dealt with test scores obtained by the students prior to learning facilitation and test scores after learning facilitation took place. Pre-test scores on English literacy tests were obtained before English Academic Literacy learning facilitation sessions with students (one actual and two after the English Academic Literacy learning facilitation sessions). Measurement of performance was thus possible prior and after the learning facilitation.

Numerical results were used to calculate frequencies, compile frequency distribution tables and determine central tendency. These scores allowed for the presentation of descriptive statistics, followed by the application of inferential statistical functions. Inferential statistical functions, such as Chi-squared tests, allowed for the testing of the hypotheses about the association between central tendency and group values. Directed by the adapted action research-guided design, reflective conclusions were made on the learning experience during the reflection stage of the cycle. This is the case, although reflection was continuous during the full duration of the Action Learning Action Research

cycle. Reflection by the researcher comes to the front during the planning phase of the action research cycle (see section 5.6) and after the action of the learning facilitation in *Second Life*<sup>TM</sup> (see section 5.8). Reflection by the students and the facilitator (see section 5.8) triangulates the data represented in this chapter. Because of the Action Learning Action Research design, the opportunity for the formulation of Grounded Theory became clear. Grounded Theory was the product of the reflection at the final stage of the action research cycle. This theory emanated in markers that were developed to reshape higher education in Africa and conclusions on the experience of learning after a small-scale project of learning facilitation in *Second Life*<sup>TM</sup> at an African university was created.

This part of the study has an autonomous population and sample, just as the research design described. The population and sample are explained hereafter.

### 5.2.1 Population

In this part of the study, the population refers to first-year students with basic English Academic Literacy skills<sup>29</sup> at the University of the Free State in 2017. This population was chosen for this part of the study because these students originated from all the faculties from the University of the Free State. All first-time entering students in all subject fields must write the test determining their English Academic Literacy ability and skills. The students were thus representative of all fields of study and did not limit this study to students from just one subject field discipline.

This population of students with basic English Academic Literacy skills (NBT, 2022) was obliged to complete an additional English Academic Literacy module, EALH1508. This had to be completed with the rest of their degree modules in their first year. See Appendix G for the NBT Benchmark Levels. The motivation therefore was to enhance their English Academic Literacy skills over a period of a year, with the aim in mind of helping them to articulate themselves better in writing to have a better chance to complete their degrees

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<sup>29</sup> English Academic Literacy skills are determined at university level in South Africa by National Benchmark Tests (NBT). Most of the universities in South Africa use National Benchmark Tests to determine the proficiency of their first-year intake of students in terms of English Academic Literacy.

successfully. The population size was 1,919 students in the mentioned year (UFS, 2019:29).

It is noteworthy to take cognisance thereof that English Academic Literacy levels of students that enter higher education remains a systemic challenge. In South Africa, the National Benchmark Tests show that 75% of students that register at universities need support to meet the demands of academic writing and tests. The profile of students at the University of the Free State mirrors the national averages. Furthermore, in this same year of 2017, there was a policy change in the language of tuition at this university whereby it changed from a parallel medium university to an English-medium only university. This led to an even greater group of students that required language development support.

### **5.2.2 Sample selection**

Samples are selected from populations by partial enumeration, leading to either probability or non-probability sampling. In this chapter, non-probability sampling was used to select a sample from the demarcated student population described in section 5.2.1. The sample participants were selected in a non-random manner. The researcher realised that this manner of sampling was easier to achieve than for example random probability sampling. Because non-probability sampling is often used with multimethodology research, the researcher deemed it fit for this section of the empirical research. Notwithstanding these advantages, the researcher was also aware of the risk of selection bias that can become part of the research more easily and that this type of sampling is not always feasible for generalisation to the population, namely all first-year students at the UFS who must complete a year module in English Academic Literacy. Taking the advantages and considerations into account, the researcher decided on non-probability sampling. This type of sampling is used to target a specific group of participants, but it acknowledges that this group does not represent the whole population. Sample selection was thus not random, but based on the availability of participants (Cohen, et al., 2017; Maree & Pietersen, 2007). Because non-probability sampling is often associated with small groups, and frequently with action research, (Cooper, et al., 2018) this type of sample selection was deemed the best for the research described in this chapter.

There are different types of non-probability sampling, such as volunteer convenience sampling, which was used in this part of the research. Voluntary convenience sampling was used in this study. The English Academic Literacy learning facilitators presenting EALH1508 were approached and one of them volunteered his class and himself as learning facilitator, to be part of the study (Cohen, et al., 2017). The size of the sample used in this part of the study was 25 students, which equals the number of students in the nominated EALH1508 class of Dr Peet van Aardt, the learning facilitator that volunteered his class and facilitation time, based on the invitation of the researcher. Volunteer convenience sampling is thus applicable in this part of the study, since the researcher used the accessible students and facilitator that were available at the time of the research as the sample (Cohen, et al., 2017).

### 5.2.3 Data collection

The gathering of data happened during the *preparation* for a *Second Life*<sup>™</sup> learning facilitation classroom for an African university; the *creation* of this *Second Life*<sup>™</sup> learning facilitation classroom; *orientation* of the researcher herself within this domain; *preparation* of the University's ICT division; *reflection* by the facilitator and *observation* of students before the learning facilitation; during the learning facilitation and after the learning facilitation. The collected quantitative and qualitative data from the multi-methods used were converged, triangulated, and validated to respond to the third research question.

Students were given a test to complete **before** the learning facilitation of English Academic Literacy (EALH1508) at the UFS commenced face-to-face and in *Second Life*<sup>™</sup>. Thereafter, learning facilitation took place. The same test was given to them **after** the learning facilitation of English Academic Literacy (EALH1508) at the UFS took place face-to-face and in *Second Life*<sup>™</sup> to see if their comprehension bettered. The value of tests is that they may be administered to respondents to test their knowledge level on their comprehension of specific content and result in primary quantitative data. Numerical, primary quantitative data was collected by means of pre-test and post-test scores on English Academic Literacy tests completed by students. The qualitative and quantitative data was triangulated.

Primary qualitative data was gathered by the researcher, whereby detailed notes were taken, and rich descriptions made, of direct observations on the behaviour of students during English Academic Literacy (EALH1508) facilitation at the UFS both in face-to-face and in *Second Life*<sup>TM</sup> learning facilitation sessions. Direct observations focused on the student experience and learning and the role of the learning facilitator. This was recorded in the reflective journal of the researcher. Together with the notes on observations made, the researcher also wrote a reflective narrative that was also recorded in the reflective journal of the researcher.

Primary qualitative data was further received from the students who were requested to reflect individually by means of ethnographical narratives on their learning facilitation experience during the learning facilitation of English Academic Literacy (EALH1508) at the UFS in face-to-face and in *Second Life*<sup>TM</sup> learning facilitation sessions. Ethnographical narratives as the written essays, stories, and experiences of participants, from their perspective, portray their beliefs and encounters regarding the research problem. The data collected from ethnographic narratives are qualitative and primary.

Primary qualitative data was also collected from the learning facilitator, who was asked to reflect on his learning facilitation experience with the students during the learning facilitation of English Academic Literacy (EALH1508) at the UFS in face-to-face and *Second Life*<sup>TM</sup> learning facilitation sessions. Reflection is dialectic, because it focuses inwards on the thoughts of the learning facilitator and outwards at the situation in which the learning facilitator finds himself. This led to the gathering of qualitative data.

A nominal group discussion was held with the students who were part of the learning facilitation of English Academic Literacy (EALH1508) at the UFS in face-to-face and *Second Life*<sup>TM</sup> learning facilitation sessions. This first-hand discussion by the researcher took place after all the learning facilitation sessions were concluded. The nominal group technique was facilitated by the researcher herself as a small group discussion structured with the aim of reaching consensus on the research problem at hand. A moderator poses questions to a small group and each member of the group is requested to respond to the

question. A round-robin feedback session follows. Each idea is written down on a flipchart until all responses are recorded. Responses are then clarified and discussed. The ideas are prioritised by each one in the group. The priorities of each group member are tallied and ranked to indicate the highest priority or value allocated to the group (Cohen, et al., 2017; Dunham, 2018; Tutenges, 2019). Primary qualitative data was collected in this way as narrative transcripts from this nominal group discussion with students.

The analysis of the collected qualitative and quantitative data that was gathered by the multimethodology strategy is discussed in the following section.

### **5.3 Data analysis**

Data analyses were done according to the chronological stages of the creation of a small-scale project of learning facilitation face-to-face and in *Second Life*<sup>™</sup>. The different stages were preparation, creation, orientation, and learning facilitation sessions. During each of these stages, data was collected as described in Chapter 5.5 and analysed.

The type of qualitative data collected from the observations by the researcher, the reflection by the researcher, the learning facilitator and students, the nominal group discussion with the students and the ethnographical representations was narrative content. The data analysis was done by means of content analysis that comprised coding, key area identification, combination of key areas and re-coding. Thereafter, the data was grouped and themed. Quantitative data was collected from pre-test scores and post-test scores from the face-to-face learning facilitation sessions in EALH1508, as well as the learning facilitation sessions in *Second Life*<sup>™</sup>. The data that was gathered was parametric and ratio data. The data was analysed by means of the descriptive statistics of frequency distribution, central tendency, mean, median, mode, variation, standard deviation, and cross tabulation. Inferential statistics was interpreted by means of a z-score comparison, Chi-square and a one-sample t-test.

## **5.4 Planning before the creation of a small-scale *Second Life*<sup>TM</sup> learning facilitation project**

This section addresses the planning that took place and the preparations that had to be done before a *Second Life*<sup>TM</sup> learning facilitation classroom at an African university, namely the University of the Free State, could be created. Planning and preparation had to be done on the choice of the higher education institution in Africa where learning facilitation in *Second Life*<sup>TM</sup> could be explored; if the land in *Second Life*<sup>TM</sup> would be bought (or rented) or free researcher space used; and on the evaluation of the current ICT infrastructure at the selected university. Only after the thorough planning and preparation phase by the researcher, the creation of a small-scale learning facilitation project at the University of the Free State in *Second Life*<sup>TM</sup> could commence.

### **5.4.1 Choice of a higher education institution**

To explore learning facilitation in *Second Life*<sup>TM</sup> at a higher education institution specifically in Africa, an institution was selected within the most southern part of this continent, namely in South Africa. The University of the Free State (UFS) in Bloemfontein, South Africa, was selected. This university was chosen because the researcher is an employee at this institution. The learning facilitation processes, as well as ICT systems and channels at the institution are known to the researcher. This residence knowledge served as motivation and assisted the researcher in streamlining communication with ICT during the exploration of learning facilitation in *Second Life*<sup>TM</sup>.

### **5.4.2 Acquiring land in *Second Life*<sup>TM</sup>**

For facilitation to happen in a *Second Life*<sup>TM</sup> learning facilitation space, land must be acquired in this domain. Land is acquired from the company that created *Second Life*<sup>TM</sup>, namely Linden Lab. There is a two-tier rate structure available for land purchasing or renting in *Second Life*<sup>TM</sup>. One tier refers to normal rates and is applicable to the Land of Business. In the Land of Business, land can be bought or rented, and a maintenance fee is applicable. The second tier is called the Land for Higher Education and applicable to educational and not-for-profit organisations, where a discount of 50% applies regarding

buying or renting and maintenance. In both tiers, land is either bought or rented inworld. The diagram in Figure 5.2 below illustrates the two pathways that businesses or higher education institutions can take by either buying or renting land. Note the 50% discount on the picture to the right side.

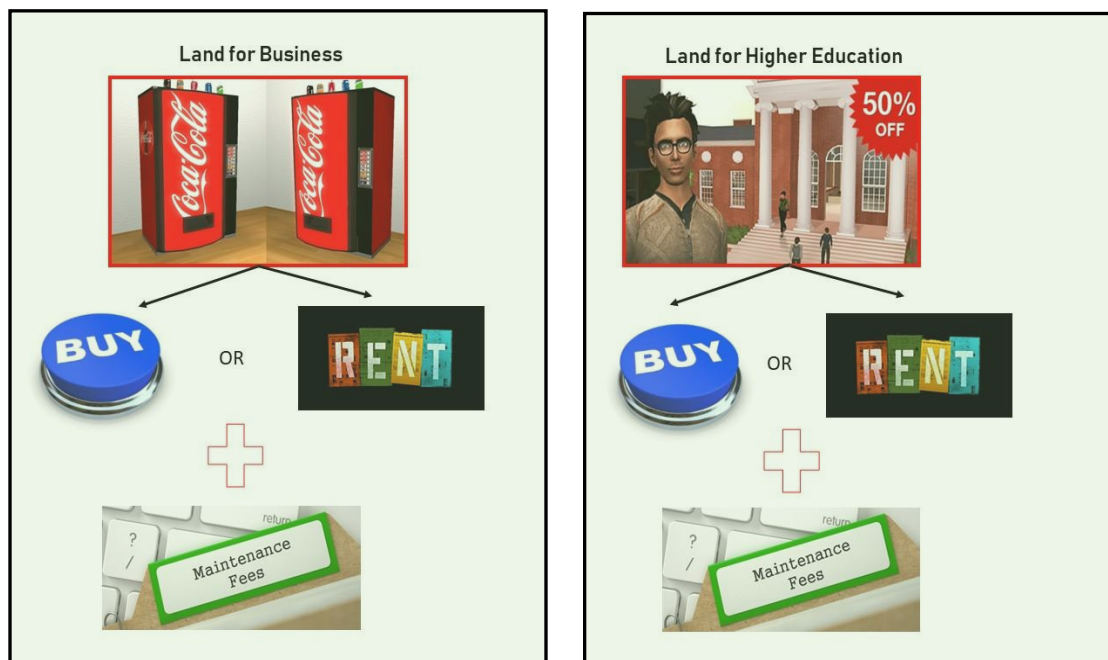


Figure 5.2: Two-tier rate structure for businesses and educational institutions to acquire land in *Second Life*™ (Liebenberg, 2020)

Land is purchased or rented in *Second Life*™ per region, which equals 65,536 m<sup>2</sup>. Land can also be purchased or rented as a fraction of a region. These fractions range from 1/128 of a region up to a full region. Payments must be made in US dollars<sup>30</sup>. With both purchase and rental in *Second Life*™, an annual maintenance fee is levied per region according to the size of the region<sup>31</sup>. Free space developed by researchers can also be used, but exclusivity is not guaranteed for only registered students to attend facilitation sessions.

<sup>30</sup> If the purchasing route is followed, a single region is bought at a price of US\$349 (Linden Lab, 2020). A discount of 50% applies to educational institutions and not-for-profit organisations in *Second Life*™.

<sup>31</sup> The normal annual maintenance fee in *Second Life*™ for a full single region is US\$229. In the case of educational institutions, only half of the fee is charged per year for the same region size, namely US\$114.50

One (1) region of land was purchased in *Second Life*<sup>TM</sup> from Linden Lab by the researcher, the maintenance for the land was paid as well as the building costs<sup>32</sup> for the University of the Free State learning facilitation space<sup>33</sup>. The land acquired in *Second Life*<sup>TM</sup> was uninhabited and did not have any structures, as is the case with any purchase of land in *Second Life*<sup>TM</sup>. The choice of purchasing and not using a pre-developed space for research, was motivated to keep the space exclusive for the research to happen in a safe environment for students, excluding grieving and intrusion as much as possible. Thus, the construction of a UFS learning facilitation space became the next priority after the evaluation of the University of the Free State ICT infrastructure, compatibility with, and access to *Second Life*<sup>TM</sup>.

### **5.4.3 UFS ICT infrastructure, compatibility with and access to *Second Life*<sup>TM</sup>**

Firewalls and anti-virus software of organisations and higher education institutions frequently block access to *Second Life*<sup>TM</sup>. This is also the case at the University of the Free State. Currently, it is not possible to access *Second Life*<sup>TM</sup> from the ICT network of the University of the Free State. ICT Services at the UFS blocks *Second Life*<sup>TM</sup> access and operations for security reasons when web-users are under the UFS network cloud. However, it needs to be mentioned that the administrators of Linden Lab developed guidelines on how to configure the software and firewalls of organisations and higher education institutions (especially for Norton, McAfee and ZoneAlarm) to aid access to *Second Life*<sup>TM</sup>. Directions on how to use *Second Life*<sup>TM</sup> from a closed network in terms of proxy settings, HTTP proxy, SOCKS5 proxy, other HTTP traffic, and caveats are also provided (Linden Lab, 2022).

Considering the demographic factors of students, the researcher decided that the learning facilitation sessions to be set up in *Second Life*<sup>TM</sup> had to take place under the UFS ICT

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<sup>32</sup> This amounted to a total cost of US\$885 on the Linden Lab invoice, because the building costs of a learning facilitation space at the University of the Free State in *Second Life*<sup>TM</sup> was included. The total cost in ZAR rand for acquiring and maintaining land together with building costs amounted to R16,249.94.

<sup>33</sup> The cost of vacant land in urban areas in South Africa equals R1000 per m<sup>2</sup> (on average). If 65,536 m<sup>2</sup> of land are to be acquired in an urban area, where higher education institutions are often located, the cost of an equal size area of land, alone, will amount to an estimated R65,536,000. The *Second Life*<sup>TM</sup> costs to purchase the same size of land equals R6,344.75. This is minimal, and less than 1% of the real-life costs.

network cloud. This would ensure that students had network stability, high-speed broadband access and no network costs had to be incurred. The risk of the possibility of having network instability, as a moderating variable in this research, was thus mitigated. Network instability could negatively influence perceptions about *Second Life*<sup>™</sup> and therefore this moderating variable had to be minimised. Therefore, the researcher approached ICT Services of the UFS during the preparation phase of the creation of this small-scale project and formally requested permission for the necessary ports within the UFS firewalls to be opened for scheduled periods when the planned *Second Life*<sup>™</sup> learning facilitation was deemed to take place. First, the senior director of ICT Services was approached and the rationale for the request was explained in this meeting. Permission was granted. After this, three meetings were subsequently held with the relevant director and deputy director of ICT Services, to discuss the operational requirements for the upcoming *Second Life*<sup>™</sup> learning facilitation sessions. Further communication with them occurred frequently amongst them by means of emails or telephone conversations to ensure access for the students and learning facilitator for two scheduled classes in *Second Life*<sup>™</sup> would happen. After the ICT preparations were complete, the researcher started with the creation of a *Second Life*<sup>™</sup> learning facilitation space for an African University. She started to negotiate on the design and creation of the learning facilitation space with Linden Lab. The activities during the creation phase are discussed hereafter.

## **5.5 Creation of a *Second Life*<sup>™</sup> learning facilitation space**

After the preparation phase, the creation of a *Second Life*<sup>™</sup> learning facilitation space for an African university at the University of the Free State followed. To do so, the following steps had to be followed, namely access to the *Second Life*<sup>™</sup> viewer had to be ensured for the researcher as well as registration as an avatar in *Second Life*<sup>™</sup>; the creation of a UFS learning facilitation space in *Second Life*<sup>™</sup> was paramount; followed by the interior design of the learning facilitation space; the identification of the module to be facilitated in *Second Life*<sup>™</sup>; recruitment of the learning facilitator and the recruitment of the student cohort.

### 5.5.1 Access to the *Second Life*<sup>TM</sup> viewer

Anyone who wants to access *Second Life*<sup>TM</sup> must download the *Second Life*<sup>TM</sup> viewer, which is free of charge. See Figure 5.3 at the bottom right corner how the *Second Life*<sup>TM</sup> viewer download button displays on the *Second Life*<sup>TM</sup> website (Second Life, 2022). The

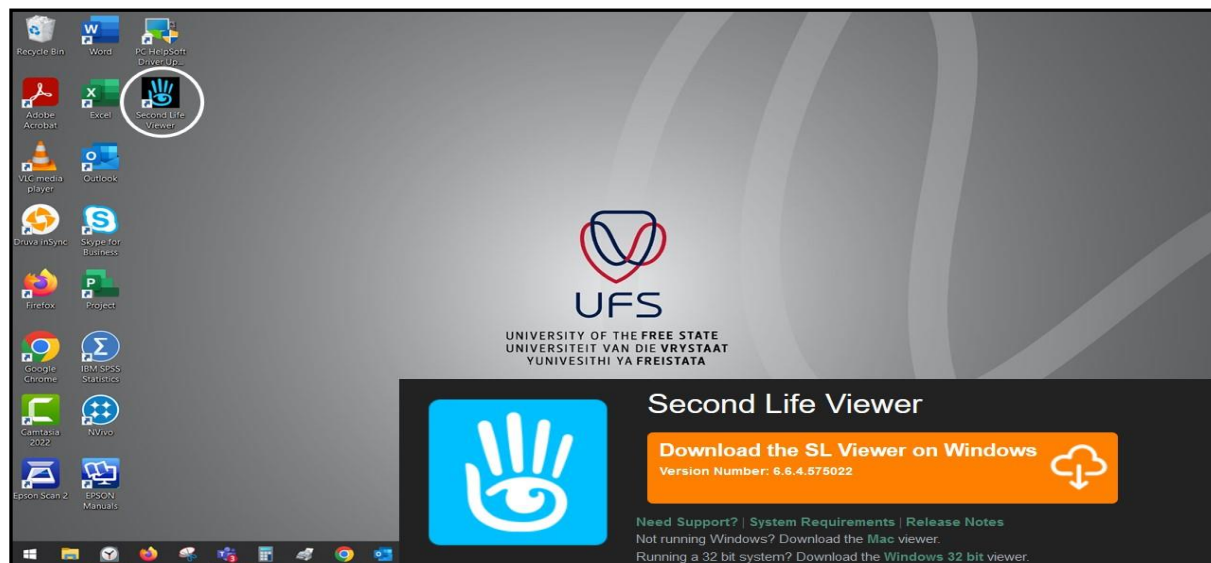


Figure 5.3: *Second Life*<sup>TM</sup> viewer and shortcut on screen of researcher (Linden Lab, 2022)

*Second Life*<sup>TM</sup> viewer<sup>34</sup> has a maximum size of only 1.85KB for the shortcut on a device that it is installed and an installation size of about 110MB. Initially, the logo of *Second Life*<sup>TM</sup> was light green but it changed to blue, as can be seen on the encircled shortcut on the researcher's device to *Second Life*<sup>TM</sup> in Figure 5.3, The researcher downloaded this viewer when *Second Life*<sup>TM</sup> commenced in 2009 and updated the versions since then, as they were released. This was not required as a new action during this study, but future researchers have to do this during the creation phase of the setting up of a learning space in this domain, in order to access to *Second Life*<sup>TM</sup>.

<sup>34</sup> This viewer has evolved through different versions and by October 2022 the version number of 6.6.4.575022 was reached.

### 5.5.2 Registration as avatar in *Second Life*<sup>TM</sup>

When the researcher became interested in *Second Life*<sup>TM</sup> and its learning facilitation options, in 2009, she downloaded the *Second Life*<sup>TM</sup> viewer, registered an account and created an avatar. The researcher chose a female avatar in *Second Life*<sup>TM</sup> with the name and surname of Jungy Svenson. The researcher kept this avatar over the years. To lessen the focus on the researcher in *Second Life*<sup>TM</sup>, she chose a very basic attire of white trousers and a white shirt to wear throughout. The researcher tried to minimise any side-distractions for the students. She tried to blend and disappear into the background of this



Figure 5.4: The researcher flies toward the UFS *Second Life*<sup>TM</sup> campus (Liebenberg, 2020; Linden Lab, 2020)

sensory evoking environment. A visual image of the researcher in *Second Life*<sup>TM</sup> is shown in Figure 5.4. In this screenshot, the researcher (aka Jungy Svenson) flies towards the inner centre of the UFS campus in *Second Life*<sup>TM</sup>.

### 5.5.3 Creation of a UFS learning facilitation space in *Second Life*<sup>TM</sup>

The next priority was to create a learning facilitation space in *Second Life*<sup>TM</sup> for the University of the Free State. It is possible to buy a prefabricated building from Linden Lab or to design a custom-made construction in *Second Life*<sup>TM</sup> for learning facilitation. For prefabricated buildings sold by Linden Lab, certain standard options exist for buyers to choose from. If land and buildings or spaces are custom-made, it implies these creations by software designers in *Second Life*<sup>TM</sup>. For this study, the decision was made to opt for a prefabricated structure to save on software design costs. The cost breakdown while

current during the research, for the creation of a prefabricated UFS building in *Second Life*<sup>TM</sup> is indicated in the footnote<sup>35</sup> at the bottom of the page.

If only one classroom of 625 m<sup>2</sup> was to be built in real life, which houses about 250 students, the cost would be about R8,125,000<sup>36</sup>. The cost of the *Second Life*<sup>TM</sup> prefabricated building, with classrooms, during the time of the research is R15,699.07, which is less than 1% of the real-life construction costs of one classroom within a building. Therefore, a prefabricated building in *Second Life*<sup>TM</sup> was purchased for the University of the Free State in South Africa on the continent of Africa.

#### 5.5.4 Interior classroom design

The interior of the learning facilitation space of the University of the Free State was carefully planned and designed before the learning facilitation commenced in *Second Life*<sup>TM</sup>. After thorough consideration, the researcher decided to keep the classroom design in line with the traditional format. The reasons for the decision to keep to a traditional classroom design were threefold: firstly, because the majority of universities in the world still favour the traditional classroom design inworld; secondly, because this classroom design type is a known to students in an unknown setting and environment (the researcher wanted to eliminate distracting factors that might act as moderating variables); and thirdly, the time available was rather used to focus on learning facilitation design (which aligns with the purpose of the study) than interior design. See Figure 5.5, which shows one of the UFS classrooms and learning facilitation spaces in *Second Life*<sup>TM</sup>, which the researcher, Jungy Svenson, visited before the start of the learning facilitation for students at the University of the Free State. Note the U-shape that makes the traditional interior design a little bit more informal. Furthermore, also take note of the absence of a presenter's desktop or table in front of the classroom. This classroom was designed in such a way that the focus moved away from the learning facilitator. The room was kept as simple as possible to lessen any distractions during learning facilitation

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<sup>35</sup> Cost breakdown for the creation of a prefabricated UFS building in *Second Life*<sup>TM</sup> = Invoice total US\$855 – land purchase US\$174.50 – maintenance fees US\$114.50 = US\$566 (R15,699.07).

<sup>36</sup> These calculations are based on the average building cost per m<sup>2</sup> in South Africa of between R8,000 and R13,000 (Ooba, 2022).

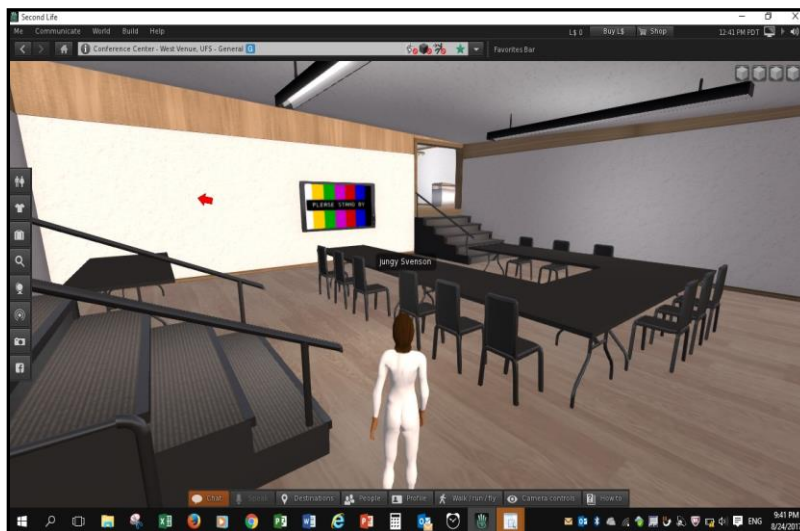


Figure 5.5: One of the UFS classrooms in Second Life™ (Liebenberg, 2022; Linden Lab, 2022)

because arrival fascination, as indicated in Chapter 2 in the adapted virtual world adjustment theory, may divide the attention of students.

### 5.5.5 Identification of the module to be facilitated in *Second Life*™

Prospective UFS students must write National Benchmark Tests (NBTs) to gain admission to this university. This is one of the admission requirements set by several of the 26 public universities in South Africa. The NBT consists of two test domains, namely Academic and Quantitative Literacy as well as Mathematics (NBT, 2022). Only English Academic Literacy and Quantitative Literacy must be written for university applications in general. The mathematics test is only applicable to selection-based degrees. Three levels of performance are possible in these tests: namely, proficient, intermediate, and basic. Proficient means that students will be able to cope with the demands of tertiary study programmes without needing extra academic support. Intermediate means that it is expected that students will face challenges in their academic performance at the universities and that they will need some academic support. Although a warning is flagged that a basic level of performance is not advisable for admission to university level and students “are seen to be unprepared for university study” (NBT, 2020:1), the UFS does admit these prospective students. However, when this group of students with basic performance on the NBT test registers as first-year students, they are obliged to attend and pass a year module on English Academic Literacy (EALH1508) at the UFS. This module is presented by the Centre of Teaching and Learning (CTL) at the UFS. English Academic Literacy (EALH1508) was selected for this research to investigate the student learning experience during learning facilitation at the UFS learning facilitation space in *Second Life*™, because of the

homogenous nature of this group in terms of their English language proficiency, but their diversity of subject fields from where they registered. Different academic proficiencies amongst students on English Academic Literacy can act as a moderating variable when learning takes place and is measured. Therefore, by choosing students that are all registered for this specific module and keeping proficiency as homogenic as possible, the risk of this mentioned moderating variable was thus mitigated.

### 5.5.6 Recruitment of the learning facilitator

The facilitators who present English Academic Literacy (EALH1508) at the UFS were approached with an email request to volunteer their class and participate in this study. Dr Peet van Aardt, one of these facilitators at the UFS, availed his class to participate in this study. He is an open-minded and seasoned lecturer at the Centre for Teaching and Learning at the University of the Free State<sup>37</sup>. A letter containing background and information of this study was sent to him after he volunteered his learning facilitation and class. A special orientation session was organised for him alone to acquaint him with *Second Life*<sup>TM</sup>. Dr van Aardt agreed to avail five of his scheduled class times to this study. Table 5.1 presents information on the purpose, dates and responsibilities of the researcher and facilitator for the learning facilitation sessions:

**Table 5.1: Purpose, dates, and responsibilities for learning facilitation sessions (Liebenberg, 2022)**

Learning facilitation session	Purpose and objective	Date	Responsible
Session 1	Introduction of the research and <i>Second Life</i> <sup>TM</sup>	2 August 2017	Researcher
Session 2	Technical orientation in a computer laboratory on the UFS South Campus	9 August 2017	Researcher
Session 3	Face-to-face learning facilitation in the real-life class of the students	18 August 2017	Dr Van Aardt
Session 4	<i>Second Life</i> <sup>TM</sup> class in the computer laboratory of the UFS South Campus	25 August 2017	Dr Van Aardt
Session 5	<i>Second Life</i> <sup>TM</sup> class in the computer laboratory of the UFS South Campus	30 August 2017	Dr Van Aardt

<sup>37</sup> Dr van Aardt has been a facilitator in English Academic Literacy for twelve years and has been appointed as the head of English Academic Literacy in 2022.

Using email communication between the researcher and the facilitator, specific dates were selected and planned for these five classes. These dates for learning facilitation corresponded with the normal class times of the students, so as not to inconvenience them. The normal frequency of contact class time for the EALH1508 module is twice a week. Dr van Aardt was requested to facilitate both the on-campus face-to-face and the *Second Life*<sup>™</sup> learning facilitation sessions. This was motivated by the perspective to keep the facilitator a constant variable in the research, namely being a constant to students in the face-to-face and *Second Life*<sup>™</sup> learning facilitation sessions. The already set learning outcomes for the EALH1508 module were used during the study. This was prompted by the motivation not to disturb the normal academic programme, or progress, of this student group. The aim was to keep the study as close as possible to the conditions that students were used to and lessen any moderating distractions that could influence the reliability and validity of the results of the study.

### **5.5.7 Recruitment of the student cohort**

The EALH1508 students undergo structured face-to-face facilitation on the South Campus of the UFS twice a week. In each class, there are usually between 20 and 40 students and in this volunteered class, there were 25 students. Although the class group for this study was volunteered, and it thus translates to convenience non-probability sampling, the researcher remained sensitive to accommodate as diverse a group of participants as possible. The researcher also acknowledged the digitally varied population of students at the UFS, with special provision made to include digital natives, digital immigrants, and digital strangers. During the first learning facilitation session, on 2 August 2017, the researcher facilitated the students' EALH1508 class on the UFS South Campus. In this session, the researcher introduced *Second Life*<sup>™</sup> to the students and the way that the learning facilitation was foreseen in *Second Life*<sup>™</sup> to take place during the upcoming scheduled class times. The agenda for the orientation of 2 August 2017,

displayed as Figure 5.6, was used. The second part of the agenda was followed in the next class on 9 August 2017. During the face-to-face learning facilitation session of 2 August 2017, the researcher introduced herself and her supervisor, who had accompanied her, to the EALH1508 class of Dr Peet van Aardt. She then introduced the study and the concept of virtual worlds and *Second Life*<sup>™</sup> to the class. An information letter that explained the study, together with the informed consent forms, were handed out to the students at the end of the introduction session. At this stage, they were requested to participate in this study. Students were given a week to decide if they would become part of the study. If they did not feel comfortable to be part of the study, and the *Second Life*<sup>™</sup> learning facilitation, they had the opportunity not to take part and were offered an additional face-to-face learning facilitation session by the facilitator to cover



Figure 5.6: Agenda for the introductory session at the EALH1508 class on 2 August 2017 (Liebenberg, 2017)

the facilitated content of the *Second Life*<sup>™</sup> learning facilitation sessions. Thus, they would not miss any work. Those students that agreed to take part in the study were requested to read the information letter again and sign the informed consent form. The forms were received from the students on 9 August 2017, and they were kept under lock and key. Hereafter, the different orientation sessions of the researcher, ICT, the learning facilitator, and the students in *Second Life*<sup>™</sup> are discussed.

## 5.6 Orientation of the researcher, ICT, the facilitator, and students before the learning facilitation in *Second Life*<sup>TM</sup>

With the hardware and software infrastructure in place for learning facilitation in *Second Life*<sup>TM</sup> at the UFS in South Africa, the orientation, facilitation, and student learning experience in *Second Life*<sup>TM</sup> could start. This orientation process began with the researcher immersing herself in *Second Life*<sup>TM</sup> for one full day to orientate herself with the UFS learning facilitation space available inworld; to observe the designed interior with artefacts and possibilities to plan further as well as reflect on the student learning experience inworld and the relation of the learning facilitation with the adapted Virtual World Adjustment Theory. This was followed by the orientation of ICT Services, the facilitator, and students.

### 5.6.1 Researcher orientation: a day alone in *Second Life*<sup>TM</sup>

The researcher spent one full day of contemplation, observation, and reflection at the UFS *Second Life*<sup>TM</sup> campus, within the UFS *Second Life*<sup>TM</sup> learning facilitation spaces and the surroundings to the UFS campus in *Second Life*<sup>TM</sup>. The orientation day was used to observe, plan, and reflect, which is typical of Action Research cycles. See Figure 5.7 for a screenshot that was taken when the researcher arrived in this capacity at the UFS

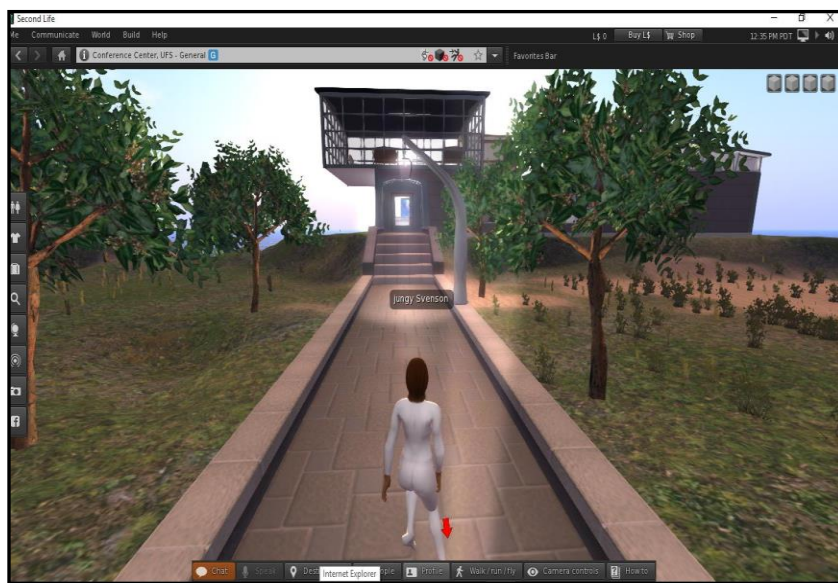


Figure 5.7: UFS building and classrooms in *Second Life*<sup>TM</sup> (*Second Life*<sup>TM</sup>, 2017)

*Second Life*<sup>TM</sup> campus for the first time in 2017. The researcher has a history of engagement in *Second Life*<sup>TM</sup> since 2009 in her personal capacity. She is registered since then as Jungy Svenson. The building displayed in the picture is the UFS building and shows one of the entrances to the learning facilitation spaces of this higher education institution. The avatar in the picture is

the researcher on her way towards the building. Besides the observations and reflection, the researcher also inspected and tried the artefacts in the learning facilitation spaces that the learning facilitator indicated he would use during the actual *Second Life*<sup>TM</sup> learning facilitation. Qualitative data gathered from the observations are discussed below in terms of a photographic record of screen shots taken during this orientation day. Each screen shot is coupled with a condensed table noting the date and the time of day when the screen capture was taken, observations made there, planning that flowed from the observations there and reflection at that stage. The adapted Virtual World Adjustment Theory was also linked to the reflection of the researcher per observation made. Figure 5.8 to Figure 5.17 shows the screen captures taken and Table 5.2 to Table 5.11 display the qualitative data on the date and time visited, the observations made, planning based on the observations, reflections thereafter and linking to the adapted Virtual World Adjustment theory.

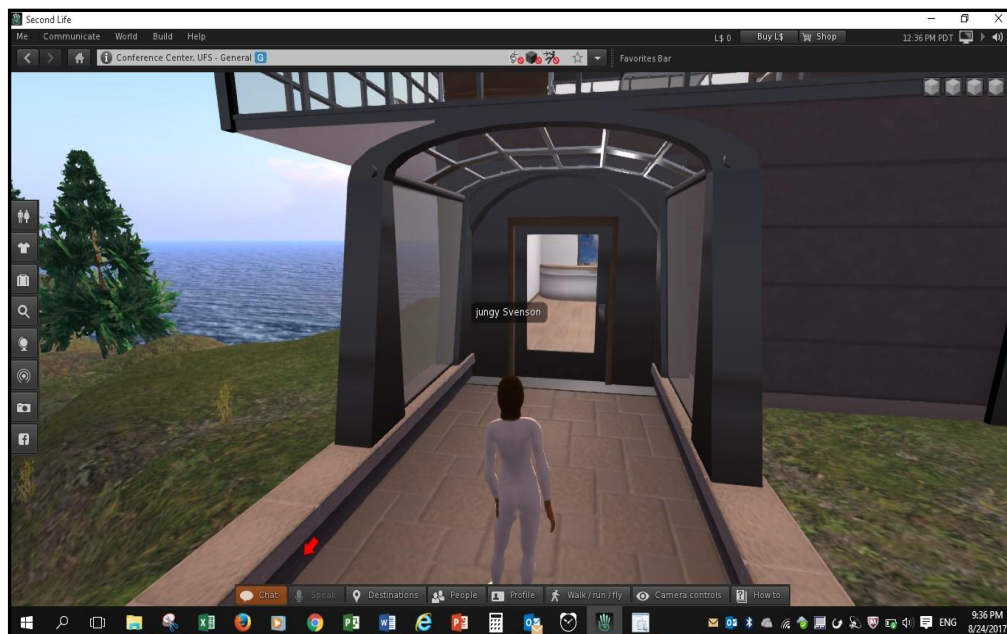


Figure 5.8: Jungy Svenson arrives at the UFS *Second Life*<sup>TM</sup> campus (Liebenberg, 2020; Linden Lab, 2022)

**Table 5.2: Observation, planning and reflection at first screen capture**

Date	26 July 2017
Time of day	09:30 South African time
Notable observations	The door to the building was closed.
Planning	Students had to be orientated how to open doors in <i>Second Life</i> <sup>TM</sup> .
Reflection	The transparent inner part of the door made the experience less daunting. The known ways of doors and entrances are set and visible within the unknown.
Adapted Virtual World Adjustment Theory	Orientation phase coupled with a problem posed of the door closed, as indicated by the Pebble-in-the-Pond Instructional Design model.

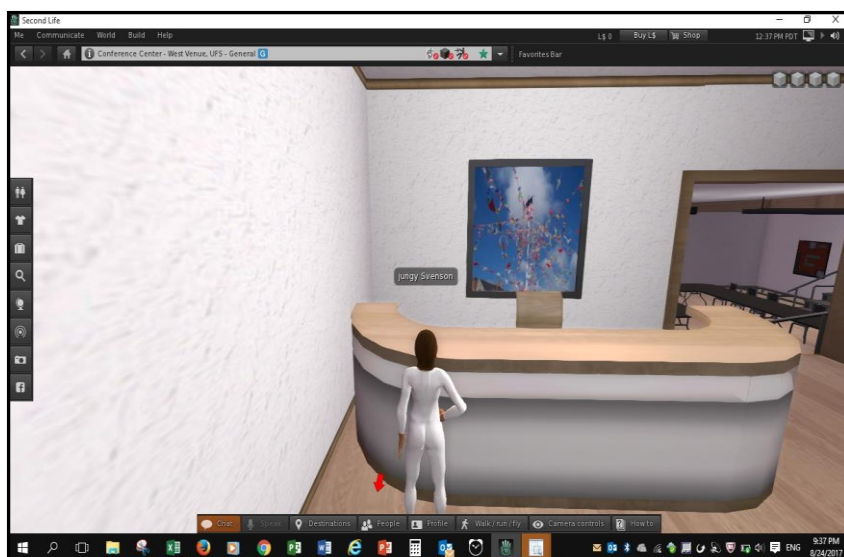


Figure 5.9: Jungy Svenson observes the first point of entry on arrival (Liebenberg, 2020; Linden Lab, 2020)

**Table 5.3: Observation, planning and reflection at second screen capture**

Date	26 July 2017
Time of day	09:37 South African time
Notable observations	The empty reception space needed an avatar to welcome the students.
Planning	The researcher decided to ask the facilitator to be waiting at this desk on the day of facilitation, when the researcher welcomed the students outside on arrival.
Reflection	The reception area, resembling real life, assists in putting the students at ease, together with the familiar learning facilitator avatar welcoming them.
Adapted Virtual World Adjustment Theory	The arrival fascination is part of the Euphoria phase, plus Connectivism shows the importance of networking for students to understand the environment and Multimodality Theory to use all senses to comprehend the surroundings.

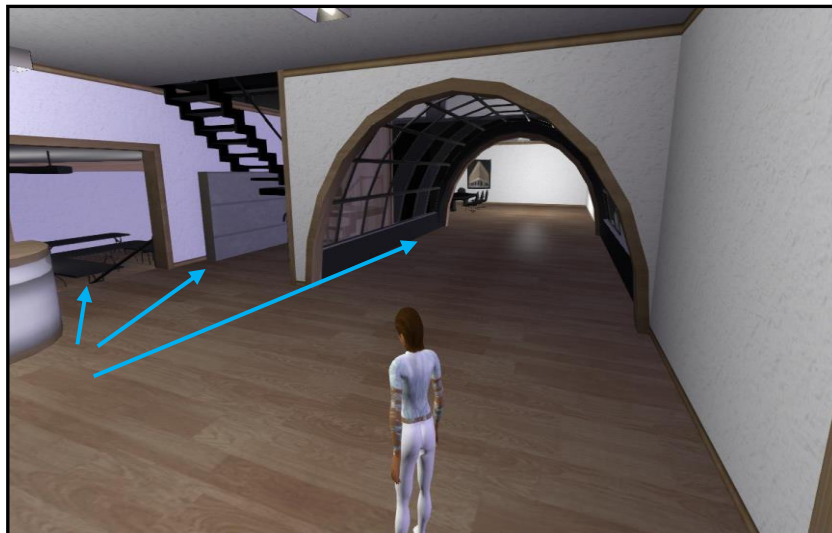


Figure 5.10: Jungy Svenson steps back and observes the three angles from the reception desk (Liebenberg, 2020; Linden Lab, 2020)

**Table 5.4: Observation, planning and reflection at third screen capture**

Date	26 July 2017
Time of day	09:57 South African time
Notable observations	There are three visible entry points to classes from the reception desk.
Planning	The researcher asked the facilitator to indicate to the arriving students where the EALH1508 class is, also explaining the two other learning facilitation spaces.
Reflection	The options of other classes show the togetherness of campus life, even in <i>Second Life</i> <sup>TM</sup> . The three different entry form shapes symbolise the variety of possibilities and opportunities in <i>Second Life</i> <sup>TM</sup> , even in the form of architecture.
Adapted Virtual World Adjustment Theory	Cognitive and behaviour crisis of the Crisis phase that may happen in students at this stage of the entry into learning facilitation are counteracted by Connectivism and networking that explains where to go and find the EALH1508 learning facilitation space.

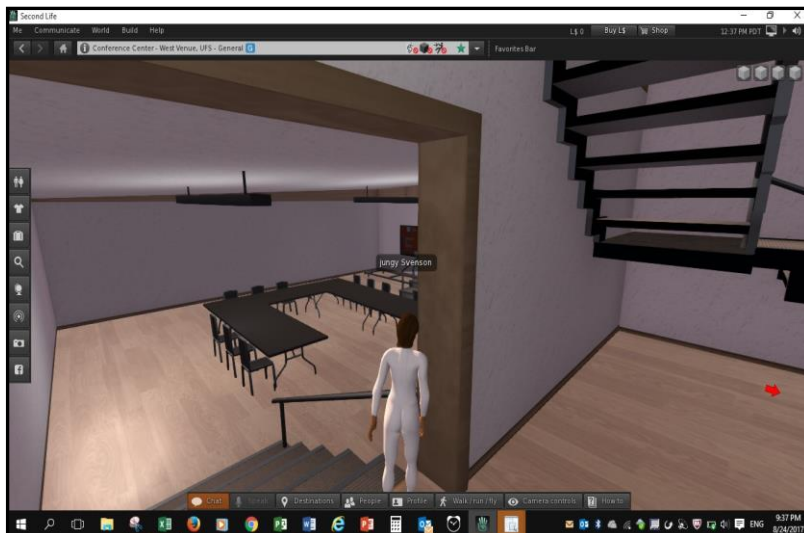


Figure 5.11: Jungy Svenson enters the learning facilitation space (Liebenberg, 2020; Linden Lab, 2020)

**Table 5.5: Observation, planning and reflection at fourth screen capture**

Date	26 July 2017
Time of day	10:43 South African time
Notable observations	The entry point to the class shows that it is spacious and inviting.
Planning	Students will sit anywhere in two parallel rows. There is no predetermined seating
Reflection	By being inside this classroom, students will not be distracted by others moving in the building. The enclosed space will better their openness to the learning facilitation.
Adapted Virtual World Adjustment Theory	The behaviour crisis of the Crisis phase is again counteracted by the networking of Connectivism, and sensory observations as stated by the Multimodality Theory.

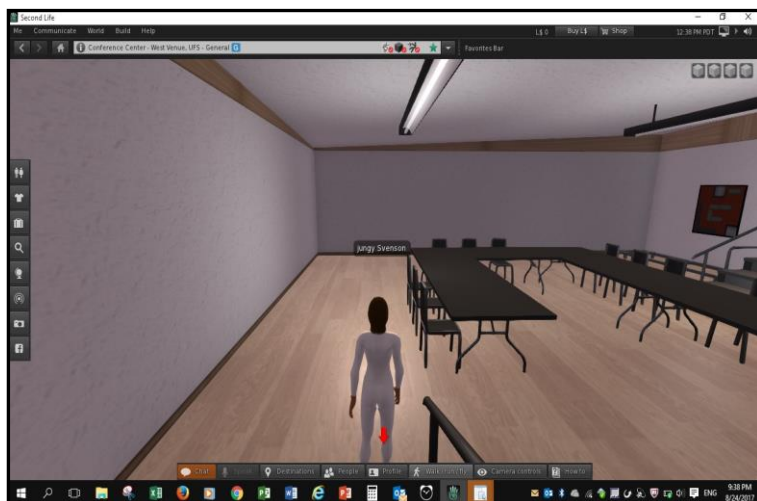


Figure 5.12: Jungy Svenson views the available rows for seating during facilitation (Liebenberg, 2008)

**Table 5.6: Observation, planning and reflection at fifth screen capture**

Date	26 July 2017
Time of day	11:01 South African time
Notable observations	The class size will allow the 25 students to sit or stand comfortably. There will still be adequate wall space to project various media types during learning facilitation
Planning	Students will become their immersed character and may sit, stand or fly in class.
Reflection	By allowing the full range of movement, even in a traditional classroom setting, a balance between freedom and structure will be achieved.
Adapted Virtual World Adjustment Theory	After the crisis phase, behavioural survival of the Survival phase will start and will be accompanied by openness to learning from the Technology Acceptance Model.



Figure 5.13: Jungy Svenson visits another learning facilitation option in the UFS Second Life™ building (Liebenberg, 2020; Linden Lab, 2020).

**Table 5.7: Observation, planning and reflection at sixth screen capture**

Date	26 July 2017
Time of day	12:47 South African time
Notable observations	Boardroom style promotes discussion. Projections against the three walls may bring variety within the learning facilitation, with planned discussion and debate.
Planning	This learning facilitation space may serve as an alternative arrangement if any factor challenged learning facilitation in the classroom of choice.
Reflection	<i>Griefing</i> or an unexpected intrusion risk, like re-arranging artefacts and the interior of the venue, necessitated the need for having an alternative facilitation space available.
Adapted Virtual World Adjustment Theory	The Affective Crisis phase is transformed to the Cognitive Survival phase by counteracting perceived threats, informing practice. Ease of use results as a product of the planning and links to the Technology Acceptance Model.



Figure 5.14: Jungy Svenson considers light, trees and clouds beneficial for Second Life™ learning facilitation (Liebenberg, 2020; Linden Lab, 2020).

**Table 5.8: Observation, planning and reflection at seventh screen capture**

Date	26 July 2017
Time of day	13:11 South African time
Notable observations	The alternative classroom resembles real life with its clouds, sky, and trees - which are visible through the top windows of this classroom.
Planning	The nature elements almost persuaded the researcher to use this classroom, but to minimise distractions, the decision was made to use the classroom with walls.
Reflection	The aim is to minimise distractions from the learning facilitation.
Adapted Virtual World Adjustment Theory	Optimal functioning in the environment, as part of the Survival phase, flows from overcoming the behavioural Crisis phase of the minimum distractions. Transformative learning flows from the promotion of reflexivity and Perceived Use from the Technology Acceptance Model.

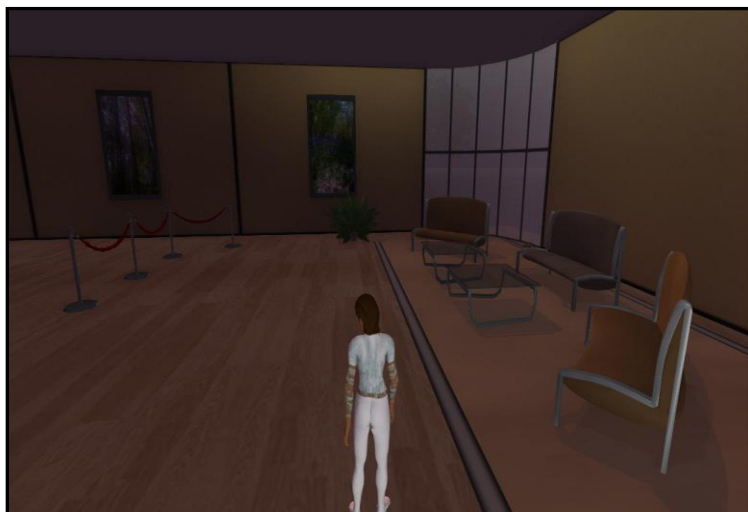


Figure 5.15: Jungy Svenson visits the non-structured area where students can socialise (Liebenberg, 2020; Linden Lab, 2020)

**Table 5.9: Observation, planning and reflection at eighth screen capture**

Date	26 July 2017
Time of day	14:49 South African time
Notable observations	Luxury vinyl was a trend in flooring in real-life in 2017, appearing like hardwood and tiles. The trend was replicated in <i>Second Life</i> <sup>™</sup> , bringing familiarity.
Planning	The social area was planned as space with its own ambience, co-created by students.
Reflection	Minimal structuring activated social liberty of students for free-flowing interaction.
Adapted Virtual World Adjustment Theory	Affective Survival of the <i>I</i> that becomes <i>We</i> and Connectivism connects to lead to Transformative Learning.



Figure 5.16: Jungy Svenson exits the UFS building (Liebenberg, 2020; Linden Lab, 2020)

**Table 5.10: Observation, planning and reflection at ninth screen capture**

Date	26 July 2017
Time of day	18:34 South African time
Notable observations	There is daylight, dusk, dawn, and night in <i>Second Life</i> <sup>TM</sup> .
Planning	The researcher plans to indicate to students during orientation that light changes in <i>Second Life</i> <sup>TM</sup> , depending on time of day. Students are encouraged to visit <i>Second Life</i> <sup>TM</sup> in the evening to experience all the times within one day.
Reflection	A sadness was felt to leave <i>Second Life</i> <sup>TM</sup> when the researcher stood outside the venue to close the door, where the first screen capture began.
Adapted Virtual World Adjustment Theory	Transformative learning of world mindedness is visible, but also the cyclical nature of Orientation re-activated when the problem of a Pebble-in-the-Pond was posed to leave this space. The emoticon of sadness was attached to this event.



Figure 5.17: Jungy Svenson ponders for a few minutes, viewing the sea and the glimpses of the moon, before she teleported back to the homeland of *Second Life*<sup>TM</sup> (Liebenberg, 2020; Linden Lab, 2020)

**Table 5.11: Observation, planning and reflection at tenth screen capture**

Date	26 July 2017
Time of day	19:11 South African time
Notable observations	The vastness of the sea and surrounding islands are pertinent and characteristic to the <i>Second Life</i> <sup>TM</sup> environment, surrounding learning facilitation spaces.
Planning	Time for student debriefing must be considered when they leave this <i>Second Life</i> <sup>TM</sup> learning space.
Reflection	Characteristics relating to the return from <i>Second Life</i> <sup>TM</sup> into the real world opens future research possibilities.
Adapted Virtual World Adjustment Theory	Cognitive identification is seen with Cognitive survival, building to Transformative Learning and the promotion of reflexivity. The Pebble-in-the-Pond model then throws the problem in of moving into the next cycle of learning.

The full day spent in *Second Life*<sup>TM</sup> was filled with notable qualitative observations, which informed the planning of the researcher for the *Second Life*<sup>TM</sup> learning facilitation to take place. The observations and planning led the researcher to reflect on the possibilities, but also challenges, associated with learning facilitation in *Second Life*<sup>TM</sup>. The adapted Virtual World Adjustment Theory was linked to the observations, experiences, planning and reflection of the researcher. The orientation of ICT Services follows.

### 5.6.2 Orientation of ICT Services

With the already acquired approval of the Senior Director of ICT Services, the Deputy Director of ICT Services was approached to open the necessary ports in the firewalls of the UFS on the three dates of 9 August 2017, 25 August 2017, and 30 August 2017. During the Orientation session with ICT Services, these dates were communicated as the time slots when students had to be able to enter *Second Life*<sup>TM</sup> from within the campus

network. The purpose of these days was also communicated to ICT Services. They were prepared that the orientation session of UFS EALH1508 students in *Second Life*<sup>™</sup> was to take place on 9 August 2017, with a face-to-face facilitation of EALH1508 students in between, followed by the two *Second Life*<sup>™</sup> learning facilitation sessions on 25 and 30 August 2017. These learning facilitation sessions were scheduled to take place in the computer laboratories on the South Campus of the UFS.

An orientation session was also scheduled with the ICT sub-division on the UFS South Campus before the orientation session with the students on 9 August 2017. The planned learning facilitation in *Second Life*<sup>™</sup> was explained to the staff of the sub-division of ICT at the South Campus computer laboratories. The ICT staff of the South Campus was requested to download the *Second Life*<sup>™</sup> viewer on all the computers in the computer laboratory before the orientation session and learning facilitation of the students. This was requested to optimise the time available for the orientation and learning facilitation in *Second Life*<sup>™</sup>. The computer laboratory was also booked for a full day for each of the three scheduled learning facilitation days, for exclusive use by the EALH1508 students. This was done to accommodate students before the orientation and the learning facilitation sessions if they wanted to enter early. More importantly, *Second Life*<sup>™</sup> had to remain open after the learning facilitation for students, for them to be able to stay in *Second Life*<sup>™</sup> as long as required after the sessions. The ICT Services sub-division on the South Campus was also requested to avail one computer laboratory assistant to be physically present on each of the three days, namely one day of orientation and the two separate days of learning facilitation. This laboratory assistant had to be present should any technical issues arise, to step in to resolve the technical glitches that might hamper learning facilitation. During this orientation session, time was also given to answer the questions from the side of ICT services.

### **5.6.3 Orientation of the facilitator**

A further, and separate, orientation session was organised for the learning facilitator in this research, namely Dr Peet van Aardt. This was done to give him the opportunity to acquaint himself with *Second Life*<sup>™</sup>. It was also a chance for him to experience the UFS

campus, building and classrooms in *Second Life*<sup>TM</sup> and to plan the learning facilitation accordingly. During the orientation session, he was also requested to write a short narrative on his experiences of the learning facilitation in *Second Life*<sup>TM</sup> after the learning facilitation sessions had been held in *Second Life*<sup>TM</sup>. A document with background information on the study was given to this facilitator, who was to serve as real, as well as an avatar, lecturer. The proceedings of the orientation day and learning facilitation sessions were discussed step-by-step with the learning facilitator. The questions of the facilitator on the operational planning of the orientation day and learning facilitation sessions were also answered during the orientation session.

#### **5.6.4 Orientation of students**

The first orientation session formed part of the recruitment session of students on 2 August 2017. Section 5.5.7 provides information on the agenda followed, namely the study that was introduced to students, informed consent forms that were distributed and an EvaSys survey link provided to them to gather their biographical data after they gave their consent. The second session of orientation took place on 9 August 2017 with the students who provided their consent to take part in learning facilitation in *Second Life*<sup>TM</sup>. During this session, EALH1508 students were given their first hands-on experience within *Second Life*<sup>TM</sup> to acquaint them with the inworld environment and prepare them for their learning facilitation sessions therein. The EALH1508 students gathered in the South Campus computer laboratory and were firstly asked to submit their signed consent forms. The question was also posed to them if anything from the guiding documentation, presented to them on 2 August 2017, was unclear. Thereafter, the remaining agenda for the class was followed, guided according to the presentation displayed in Figure 5.18. Students were shown where to locate *Second Life*<sup>TM</sup> on the internet and then they had to log into their computers and locate *Second Life*<sup>TM</sup> on the internet on their computers. Then, they were guided systematically on how to create an avatar in *Second Life*<sup>TM</sup>. The creation of their avatars began with the choice of their own avatar from a series of avatars that *Second Life*<sup>TM</sup> avails during the registration process. Thereafter, they had to create a username, but also check for its availability. Usernames may not be replicated if already selected in *Second Life*<sup>TM</sup>. A date of birth, a password, one security question answer, and

an e-mail address must be provided to complete the *Second Life*<sup>TM</sup> avatar registration

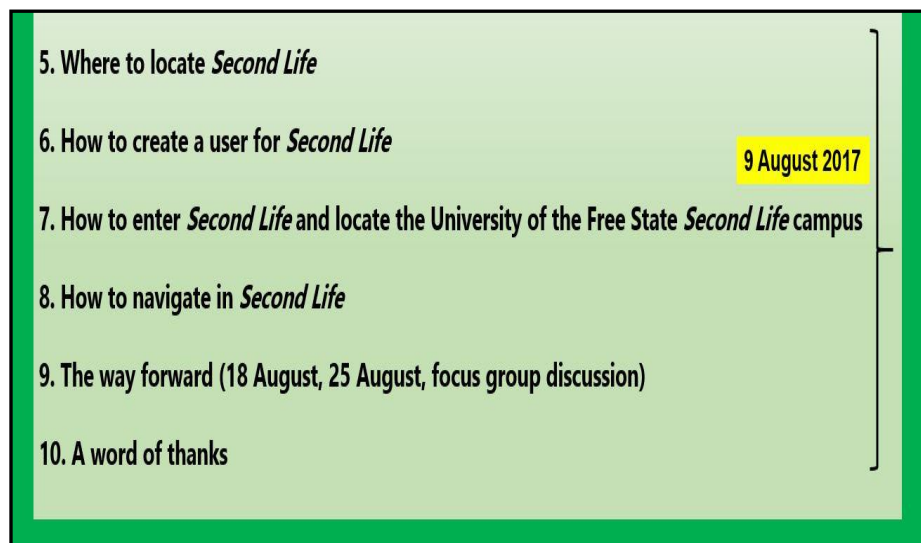


Figure 5.18: Framework for student orientation in *Second Life*<sup>TM</sup> (Liebenberg, 2017)

process. Although the *Second Life*<sup>TM</sup> viewer had already been prepared and downloaded on each of the computers in the UFS South Campus computer laboratory, the steps to do this were presented to the

students. These steps were also included in the orientation manual given to students for them to be able to download the *Second Life*<sup>TM</sup> viewer on their own devices, when convenient for them.

Thereafter, the students were shown how to log into *Second Life*<sup>TM</sup>. Students also had to log in themselves, by means of their newly registered *Second Life*<sup>TM</sup> accounts. Some of them were unsure at this stage whether they had to use their network passwords to gain access to the UFS websites, or their recently created passwords for *Second Life*<sup>TM</sup>. It was confirmed to them that their *Second Life*<sup>TM</sup> passwords had to be used. All of them were assisted to log in before any further activities were undertaken. The students entered this domain and assembled at the landing page. At the landing page, or orientation island, students were shown how to move, run, jump, fly up and down, walk and sit within *Second Life*<sup>TM</sup>. The camera view angles were also indicated to them. Thereafter, the researcher, learning facilitator and the students teleported to the UFS university campus in *Second Life*<sup>TM</sup>. The students were then allowed to explore the surroundings on their own for about 10 minutes. All of them were reluctant to stop exploring and enjoyed their own observations and probing *Second Life*<sup>TM</sup>. Then the students and facilitator were shown how to log out of *Second Life*<sup>TM</sup>. This completed the orientation session of 9 August 2017. The facilitator logged out, but the students logged in on their own again after the

orientation session concluded. All of them remained behind in the computer laboratory when the facilitator left the room. They continued to explore *Second Life*<sup>™</sup>. They were very excited about their experience and their enjoyment of being in *Second Life*<sup>™</sup> was visible. Their behaviour is in line with the adapted Virtual World Adjustment Theory because arrival fascination is part of the euphoria phase when virtual worlds are experienced. The demographical and pre- and post-test data gathered during the learning facilitation sessions that followed the different orientation sessions are analysed below.

## 5.7 Demographical data of student participants

In this section, the demographical data of the 25 participating EALH1508 students are indicated in terms of race (nominal data), gender (nominal data), age (ratio data), and physical challenges (nominal data). The nominal demographical data of race and gender is cross tabulated in Table 5.12 below.

**Table 5.12: Cross-tabulation of race and gender demographical data of EALH1508 students (Liebenberg, 2022)**

	African	Coloured	White	Indian	Total
<b>Male</b>	<b>6</b>	<b>0</b>	<b>1</b>	<b>0</b>	
% Males per race category	29%	-	100%	-	
% Males in terms of all students	24%	-	4%	-	28%
<b>Female</b>	<b>15</b>	<b>3</b>	<b>0</b>	<b>0</b>	
% Females per race category	71%	100%	-	-	
% Females in terms of all students	60%	12%	-	-	72%
<b>Total</b>	<b>21</b>	<b>3</b>	<b>1</b>	<b>0</b>	<b>100%</b>

Most students were African students (84%), followed by Coloured students (12%), and a minority of White students (4%). Most of the EALH1508 students were female, namely 72%, followed by 28% males.

The cross-tabulated data is represented in a bar graphic in Figure 5.19. The bar graphic shows the dominance of Black and Coloured women student participants within the participating EALH1508 class.

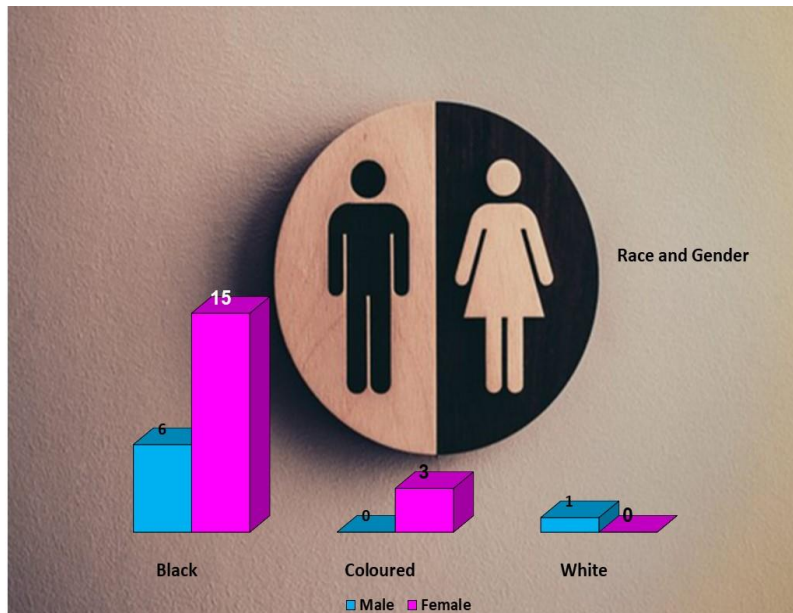


Figure 5.19: Cross tabulation of gender and race (Liebenberg, 2022)

A line graphic in Figure 5.20 shows the ages of EALH1508 students that participated in this study. The age of the different students was tabulated in a frequency distribution table with Excel360

with the statistical FREQUENCY function. The frequency distribution table, Table 5.13, was compiled to analyse the ratio data of age in terms of central tendency and variance. Central tendency was calculated for this ratio data in terms of average age, the median age, and the mode.

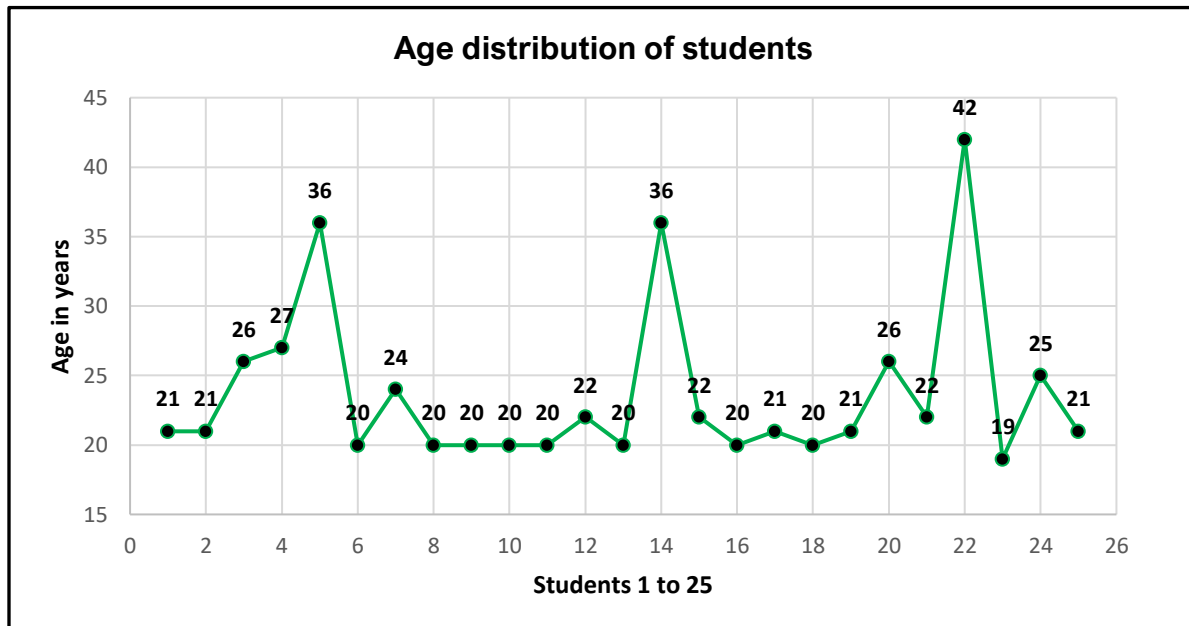


Figure 5.20: Age distribution of EALH1508 students (Liebenberg, 2022)

The average age of this EALH1508 students is calculated in the frequency distribution table, Table 5.13, as 23,7 years. The mode, namely the age that repeats the most in this group is 20 years of age, within the age range of 19 to 42 years of age. The median age, meaning the midpoint of the frequency distribution, is 21 years of age. There is thus an equal probability for an age in this EALH1508 group of students to either be above 21 years or to fall below it.

**Table 5.13: Frequency distribution table of the age of EALH1508 students (Liebenberg, 2022)**

<b>FREQUENCY DISTRIBUTION TABLE</b>	<b>Age</b>	<b>Intervals</b>	<b>Frequency</b>
	21	20	9
	*21	21	5
	26	22	3
	*27	23	0
	36	24	1
	*20	25	1
	*24	26	2
	20	27	1
	20	28	0
	*20	29	0
	20	30	0
	22	40	2
	*20	60	1
	36	The eleven participants with a visual, hearing, or other challenge (see Table 5.14) have been cross tabulated in terms of their age in the frequency distribution Table 5.13. The participants with challenges have been marked with an asterisk in this table. The average age for those with a challenge in this sample equals 22, which is below the average for the whole sample. The average of this group of participants show that they do represent the Millennial and Generation Z students, who are at representative in higher education currently. This makes the study applicable to serve the present generations and those to come.	
	22		
	*20		
	21		
	*20		
	21		
	*26		
	22		
	42		
	*19		
	*25		
	21		
<b>Average</b>	23,68		
<b>Median</b>	21		
<b>Mode</b>	20		
<b>Min</b>	19		
<b>Max</b>	42		

The variance of the ages represented in the EALH1508 students was calculated with the statistical VAR.S function of Excel360 as 33.5. Variance is a measure of how the data

points differ from the mean and it is the expected difference of deviation from the actual value. Furthermore, the value for the standard deviation, or  $\sigma$ , was calculated with the statistical STDEV.S function in Excel as 5.8. Standard deviation shows how clustered data is around the mean and indicate how dispersed the data is in relation to the average. Therefore, the  $\sigma = 5.8$  shows that the ages of students are somewhat spread and not clustered around the mean. It shows that not only young students, as generally expected in first-year classes, are present in this sample. Although this study does not exclusively present the Millennial and Generation Z voice, as seen with the standard deviation, the mode (20 years), the median (21 years) and average age (23.75 years) do indicate the Millennial and Generation Z voice as the central tendency in this EALH1508 student group. Information with regard to the prevalence of visual, hearing, and other challenges in this EALH1508 student group is cross tabulated in Table 5.14 by race and gender.

**Table 5.14: Race, gender, and challenges (Liebenberg, 2022)**

	African	Coloured	White	Indian	Total
<b>Male</b>	<b>6</b>	<b>0</b>	<b>1</b>	<b>0</b>	
Visual challenge	-	-	-	-	-
Hearing challenge	1	-	-	-	1
Other challenge	1	-	-	-	1
<b>Female</b>	<b>15</b>	<b>3</b>	<b>0</b>	<b>0</b>	
Visual challenge	7	-	-	-	7
Hearing challenge	-	-	-	-	-
Other challenge	2	-	-	-	2
<b>Total</b>	<b>21</b>	<b>3</b>	<b>1</b>	<b>0</b>	<b>11 (44%)</b>

All the visual, hearing, and other challenges are present in the African cohort in this EALH1508 student group, especially under the women. A total of 44% of this class experienced some form of challenge, either visually, by hearing or some other form of challenge. This is a significant percentage of students having some form of challenge when it comes to learning. The quantitative ratio data of the pre-test and post-test scores,

gathered from the tests that these students wrote before and after their face-to-face and *Second Life*<sup>TM</sup> learning facilitation sessions, are analysed hereafter.

## **5.8 Quantitative results of the pre- and post-tests in evaluating the learning experience of students**

In this section, the student learning experience is evaluated in terms of quantitative and qualitative data from the face-to-face and *Second Life*<sup>TM</sup> learning facilitation sessions. The quantitative data from pre- and post-test assessment scores<sup>38</sup> (ratio data) of the face-to-face English Academic Literacy facilitation session and the *Second Life*<sup>TM</sup> English Academic Literacy sessions are used to analyse the student learning experience during the learning facilitation sessions.

### **5.8.1 Pre-test and post-test score analysis of EALH1508 students**

On 18 August 2017, the facilitator presented a face-to-face learning facilitation session for the EALH1508 students. This learning facilitation happened in their usual classroom setting on the UFS South Campus. Although all 25 students consented to take part in this study, only 22 of them were present during the learning facilitation session. The focus of the learning facilitation within the English Academic Literacy domain was on the writing of a report and a news report. Before the learning facilitation commenced, a test was written by the students, testing their knowledge on the specific subject content to be presented. The scores obtained from this pre-test formed the baseline of existing knowledge of the EALH1508 students on the content and acted as a control measure against which learning could be measured. Thereafter, the learning facilitation took place by means of a PowerPoint presentation, a question-and-answer session, collaboration in groups and video clips. Exactly the same test, as written before the class commenced, was given to the students after the learning facilitation to obtain a post-test score. Learning was measured by comparing the post-test scores after the learning facilitation, against the control baseline of the pre-test scores before the learning facilitation.

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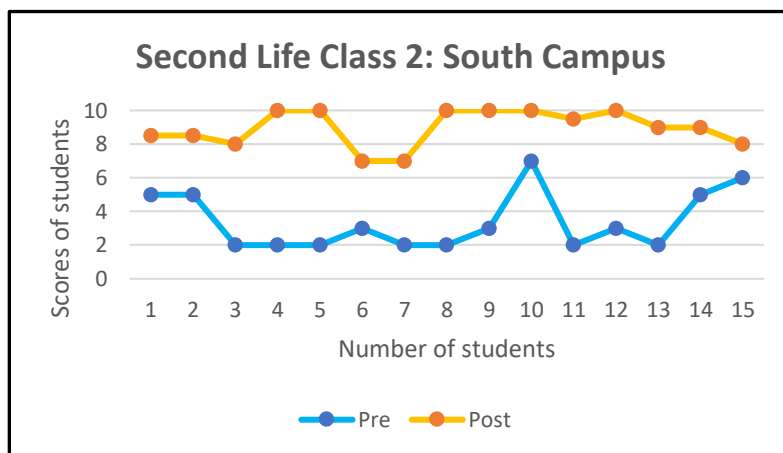
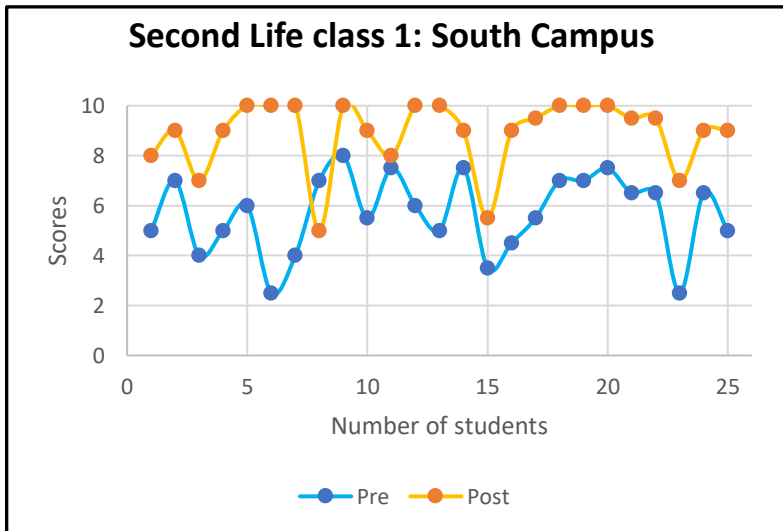
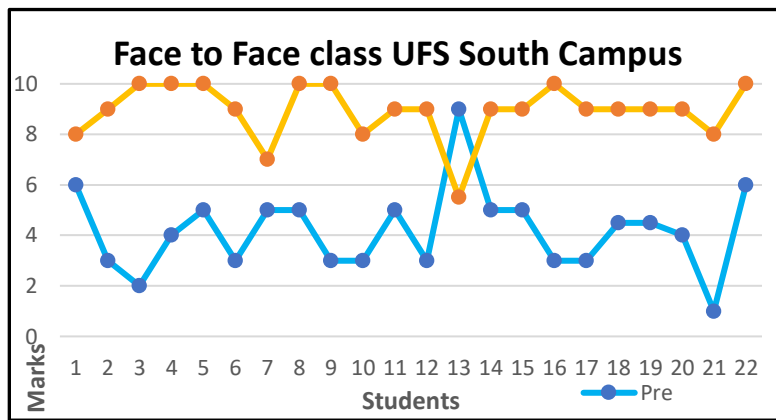
<sup>38</sup> The assessment scores are based on knowledge tests written by the EALH1508 students before learning facilitation started and right after the learning facilitation sessions.

In the following week, the first of two *Second Life*<sup>™</sup> learning facilitation sessions were presented by Dr Van Aardt in the UFS South Campus computer laboratory. In this class on Friday, 25 August 2017, all 25 EALH1508 students who had consented earlier were present in the classroom in real life and by means of their avatar representations in *Second Life*<sup>™</sup>. The topic of the class of 25 August 2017 was mass media and its role. The students were given a pre-test on the role of mass media after they settled in at the learning facilitation space in *Second Life*<sup>™</sup>. Dr Van Aardt in his avatar representation, thereafter, facilitated on the role of mass media. This class in *Second Life*<sup>™</sup> was presented by means of a PowerPoint presentation, group discussions, informal discussions, video clips and classroom facilitation. After the class concluded, the students had to rewrite the same test on the role of mass media. The second learning facilitation session in *Second Life*<sup>™</sup> took place on Wednesday, 26 August 2017. Only 15 EALH1508 students, who gave their consent earlier, were present. The reason for the fewer students was explained by fellow students as that the students were preparing for a test in another module later the same day. On 26 August 2017 the learning facilitation session focused on academic argumentation, presented by a Logic Tree. A pre-test was given to the student avatars on academic argumentation and the Logic Tree, after they had settled in at the *Second Life*<sup>™</sup> learning facilitation space. This learning facilitation session was presented by means of a PowerPoint presentation, group discussions, informal discussions, and classroom facilitation. After the learning facilitation session ended, the same test that was written before the session, on academic argumentation and the Logic Tree, was written again. Learning was measured by comparing the post-test scores after the learning facilitation in *Second Life*<sup>™</sup>, against the control baseline of the pre-test scores before the learning facilitation in *Second Life*<sup>™</sup>. The results of the pre-test and post-test scores for the learning facilitation sessions that happened face-to-face and in *Second Life*<sup>™</sup> are tabulated in Table 5.15 below.

Table 5.15: Test results and descriptive statistics (Liebenberg, 2022)

Descriptive statistics	Students	Face to Face Scores		Students	Second Life™ Learning Facilitation 1 Scores		Students	Second Life™ Learning Facilitation 2 Scores	
		Pre	Post		Pre	Post		Pre	Post
	A	6	8	A	5	8	A	5	8,5
	B	3	9	B	7	9	B	5	8,5
	C	2	10	C	4	7	C	2	8
	D	4	10	D	5	9	D	2	10
	E	5	10	E	6	10	E	2	10
	F	3	9	F	2,5	10	F	3	7
	G	5	7	G	4	10	G	2	7
	H	5	10	H	7	5	H	2	10
	I	3	10	I	8	10	I	3	10
	J	3	8	J	5,5	9	J	7	10
	K	5	9	K	7,5	8	K	2	9,5
	L	3	9	L	6	10	L	3	10
	M	9	5,5	M	5	10	M	2	9
	N	5	9	N	7,5	9	N	5	9
	O	5	9	O	3,5	5,5	O	6	8
	P	3	10	P	4,5	9			
	Q	3	9	Q	5,5	9,5			
	R	4,5	9	R	7	10			
	S	4,5	9	S	7	10			
	T	4	9	T	7,5	10			
	U	1	8	U	6,5	9,5			
	V	6	10	V	6,5	9,5			
				W	2,5	7			
				X	6,5	9			
				Y	5	9			
<b>Total</b>		92	196,5		142	222		51	134,5
<b>Mean</b>		4,18182	8,93182		5,68	8,88		3,4	8,96667
<b>Median</b>		4,25	9		6	9		3	9
<b>Mode.Multiple</b>		3	9		5	10		2	10
<b>Mode</b>		3	9		7	10		2	10
<b>Variance</b>		2,67149	1,18853		2,3376	1,9056		2,77333	1,11556
<b>Standard deviation</b>		1,63447	1,0902		1,52892	1,38043		1,66533	1,0562
<b>Pearson's correlation</b>			0.0097			0.085			0,042

Line graphics for each set of pre-test and post-test scores were drawn and they are indicated in Figure 5.21 below. In terms of the test results, the means for all three pre-



tests ranged between the scores of 3 (30%) and 6 (60%) out of 10, while the means of the scores for all three post-tests range between 8 (80%) and 9 (90%) out of 10. This is a first indication that learning took place, based on the learning facilitation. The pre-test scores of the students, before the face-to-face learning facilitation took place, are displayed by the blue line in the top quadrant of Figure 5.21 with an average of 42%. Right after the face-to-face learning facilitation, the same test was written by the same students. Thereafter, the average percentage of the post-test scores of the students increased to 89%. This increase is highly likely the result of student learning that happened because of the face-to-face learning facilitation session. The

Figure 5.21: Pre-test and post-test scores for face-to-face and Second Life™ learning facilitation sessions (Liebenberg, 2022)

same effect was seen with the learning facilitation in *Second Life*<sup>TM</sup>. The students' average percentage for the pre-test of 57% before the first learning facilitation session in *Second Life*<sup>TM</sup> rose to a post-test 89% after the learning facilitation happened. See the blue and orange lines in the middle quadrant of Figure 5.22 showing the pre-test and post-test scores respectively as blue and orange lines. This increase, just like with the face-to-face learning facilitation session, can be attributed mainly to learning that took place during this *Second Life*<sup>TM</sup> learning facilitation session. The same results were obtained with the subsequent *Second Life*<sup>TM</sup> learning facilitation session. The average percentage of the students rose to 90% after the learning facilitation inworld from 30% before the learning facilitation took place. This again confirming the learning is possible when learning facilitation happens at an African university within *Second Life*<sup>TM</sup>, just as the case with face-to-face learning facilitation.

The constant lower medians as calculated by the statistical MEDIAN function of Excel360 (4.25; 6; 3) for the three pre-tests compared to the constant higher medians (9; 9; 9) for the three post-tests again confirm that learning occurred based on the learning facilitation, albeit face-to-face or within *Second Life*<sup>TM</sup>. The central tendency of all the pre-tests scores means that before the face-to-face and *Second Life*<sup>TM</sup> learning facilitation, half of the scores of the students were less than the 4.25, 6 or 3 numerical values, with the other half above. But after the learning facilitation happened face-to-face or within *Second Life*<sup>TM</sup>, there was a significant change. Half of the scores below 9, but half of the scores were above 9. This is a strong indication of the value of learning facilitation, both face-to-face and in *Second Life*<sup>TM</sup>.

Modes were calculated by the statistical MODE.MULT function of Excel360 as 3; 5; 7; 2 for the three pre-tests compared to the constant higher prominent multiple modes (9; 10; 10) for the three post-tests. These modes further confirm that learning occurred based on the learning facilitation, because the values that repeated the most before the face-to-face and *Second Life*<sup>TM</sup> learning facilitation were 3, 5, 7 and 2. But after the face-to-face and *Second Life*<sup>TM</sup> learning facilitation, the numerical values of 9 and 10 kept on repeating most of the time.

The variance, calculated by the statistical VAR.S function of Excel360, showing the degree of spread in the data sets in the three pre-tests are similar (2.67; 2.34; 2.77). This means that the data in the data sets of the face-to-face and *Second Life*<sup>TM</sup> learning facilitation sessions are relatively close to one another and not scattered loosely over the possible scores that can be obtained. This is even more visible after the learning facilitation, showing a consolidation in knowledge on the subject matter. Post-test score variance for the three groups is 1.18; 1.9 and 1.12, which confirms the statement of learning that took place. The lesser variance in scores supports the consolidation of knowledge as seen by the closeness of values among variances of 1.18; 1.9 and 1.12. Standard deviation is also a measure of the data spread but provides even more clarity on the deviation of data from the mean. Standard deviation was calculated by the statistical STDEV.S function of Excel360. The standard deviation for all the pre- and post-test scores ranged between mostly closer to 1, but less than 2. This implies that 95% of the data values obtained from the scores will be within 2 standard deviations from the mean ( $\mu + 2\sigma < > \mu - 2\sigma$ ). The lower the value of standard deviations, the more clustered values will be towards the mean of the data set. Lower standard deviation implies that the data is indicative of a higher reliability. Standard deviation also measures the precision of a test, since it evaluates how close individual measurements are to each other. Because of the standard deviation values for the test score data sets of the students, for pre- and post-tests, ranging between 1.0562 and 1.66533 for all the tests, the reliability of all the pre- and post-tests is considered highly likely.

Two-tailed paired T-tests were also performed within this one student group per learning facilitation session to compare the means of the groups on an even basis of comparison in a standardised way. T-tests are usually also used when samples are small, like in this research, with the purpose of determining if an intervention really influenced a group of interest. In this study, the following T-value results were calculated for face-to-face and *Second Life*<sup>TM</sup> learning facilitation sessions and are summarised in Table 5.16.

**Table 5.16: Type of learning facilitation sessions and T-value**

Type of learning facilitation sessions	T-value
Face-to-face learning facilitation session	0.000000006264197
First <i>Second Life</i> <sup>™</sup> learning facilitation session	0.000000005391137
Subsequent <i>Second Life</i> <sup>™</sup> learning facilitation session	0.0000000062073855

T-values show the size of difference, relative to the variation, in the scores obtained before and after the learning facilitation. It is a ratio of departure of the estimated value of a parameter from the hypothesised value to its standard error. Small T-scores, as with this study, show that the groups are similar. Therefore, this means that learning did occur amongst students in a similar fashion in face-to-face as well in *Second Life*<sup>™</sup> learning facilitation sessions because of the learning intervention that took place.

Complementary to the quantitative data analysis showing that learning happened because of the learning facilitation sessions on a face-to-face basis and in *Second Life*<sup>™</sup>, observations were made by the researcher during these sessions. Figure 5.22 A] shows how the researcher awaits the students to arrive at the UFS building in *Second Life*<sup>™</sup> on

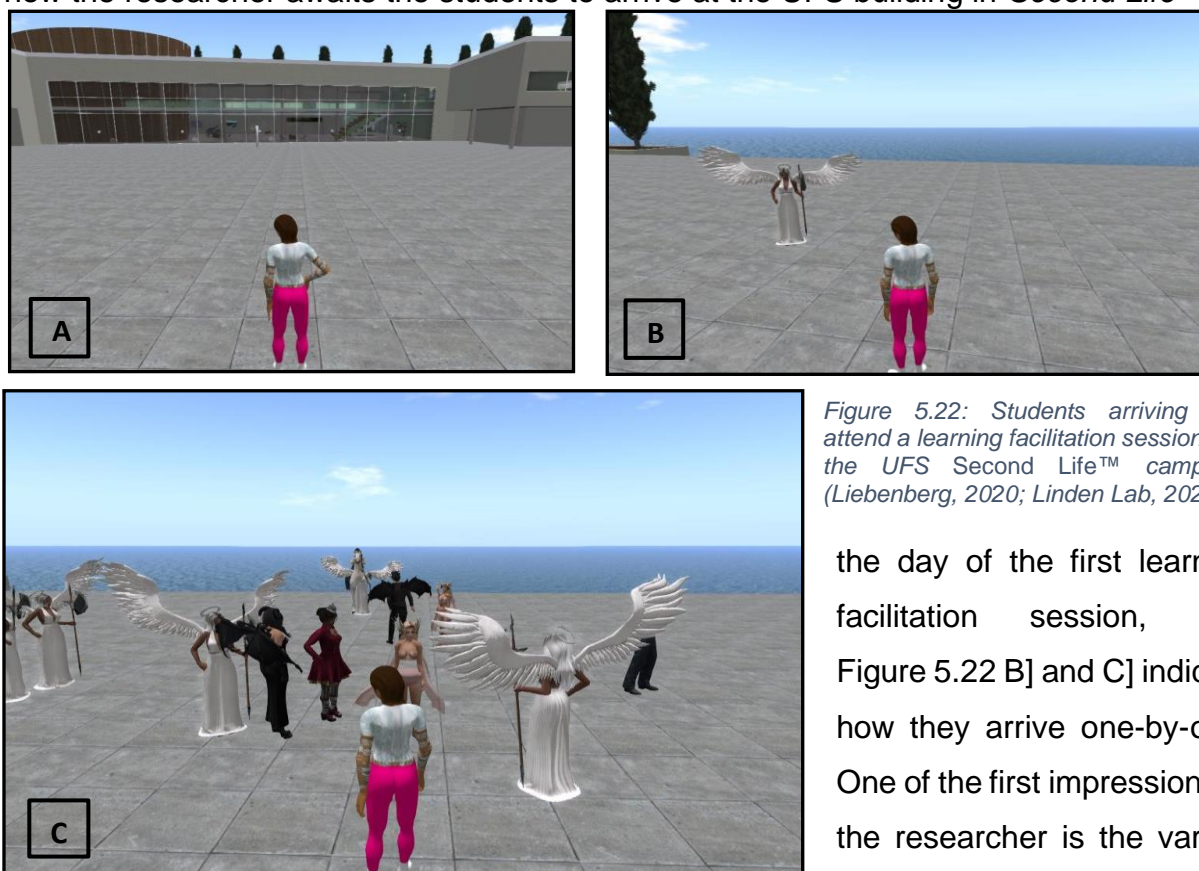


Figure 5.22: Students arriving to attend a learning facilitation session at the UFS *Second Life*<sup>™</sup> campus (Liebenberg, 2020; Linden Lab, 2020)

the day of the first learning facilitation session, and Figure 5.22 B] and C] indicate how they arrive one-by-one. One of the first impressions of the researcher is the variety



Figure 5.23: EALH1508 students taking part in UFS *Second Life*<sup>TM</sup> class (Liebenberg, 2020; Linden Lab, 2020)

figures. The avatars displayed a variety of attire and frequently interacted with one another. It took a while for the students to settle in for the learning facilitation session,



because of their fascination with all the possibilities and the new environment. The arrival fascination was clear amongst the students and these observations correspond with the Orientation and Euphoria phases of the adapted Virtual World Adjustment Theory. Two screen captures of the UFS *Second Life*<sup>TM</sup> learning facilitation happening are presented in Figure 5.23 D] and E]. Because of the orientation session, the Crisis phase (especially on the behaviour level) was short, and survival became evident. The Cognitive Survival was visible in the openness of students to ideas. Their behaviour modification was seen in the synergy that developed amongst the students during the learning facilitation session inworld. They also started to refer to them in the plural, showing their affective relationship that increased. This led to the Transformative Learning that is visible in the quantitative test results that were discussed at the beginning of Chapter 5.10.2. The subsequent section consisting of qualitative data gathered just after the learning facilitation sessions, elaborates on the learning experience during learning facilitation in *Second Life*<sup>TM</sup>.

## 5.9 Qualitative evaluation of the learning experience

By means of Action Learning Action Research, the learning experience was further analysed in terms of the qualitative data from the ethnographic narratives by the students, the reflection of the facilitator and the nominal group discussion with the students after the learning facilitation sessions in *Second Life*<sup>TM</sup>. These various data sources are all reflective, learning from the experience of the students and facilitators. These sources provided strong evidence and rich data in the reflection phase of the Action Research cycle to develop Grounded Theory on the reshaping of learning facilitation in Africa through *Second Life*<sup>TM</sup> (see Chapter 6). The data from the nominal group discussion was gathered from an interactive and lively discussion amongst the students on their learning experience. They were eager to converse and give their opinions, reflecting also if this is a real avenue for student learning in Africa. The researcher learned and gained knowledge as the nominal discussion group evolved. This primary, qualitative data that evolved from the students was recorded and is analysed below.

### 5.9.1 Nominal group discussion with the students

After the learning facilitation sessions held face-to-face and in *Second Life*<sup>TM</sup>, the students took part in a nominal group discussion. The Nominal Group Technique (NGT) was used to ensure that every student participated and expressed their opinion on their learning experience during the learning facilitation sessions in *Second Life*<sup>TM</sup> (Tight, 2012; US Department of Health and Human Services, 2018). The main purpose of a nominal group discussion is to clarify, rather than resolving differences or opinions. The Nominal Group Technique usually includes the following steps, namely starting with the posing of a question that must be brainstormed and then following up if everyone understands the question. Thereafter, every student has a chance to write down on paper as many answers as possible to the question within a time frame of 5 to 10 minutes. Each student, from the one end to the other end of the group, then gives one answer to the question asked. No discussion is allowed on the answers given; not even questions to clarify if there are uncertainty about the answers. If the group all gave their answers, a new round is opened whereby a second answer is asked from every student. This continues until all answers are given and recorded on a flip chart. When students do not have any answers

left, they may be skipped until all students gave all their answers. At this stage, all the answers are then discussed and clarified. If there is duplication amongst the answers, those answers may be removed. If answers are very close to one another, these answers may be grouped together. Thereafter, students write their top three choices, or preferred answers to the question, on a separate card (see Appendix H). They are requested to allocate the value of 3 to their top choice and value 1 to their last choice. All their votes on the cards are then added and the top replies are identified.

In the nominal group discussion of this study, two questions were posed to the students. The first question was: “What did you like most about learning in *Second Life*<sup>™</sup>?”. The second question was worded as: “What did you like least about learning in *Second Life*<sup>™</sup>?”. The questions were posed individually. The answers to the first question were exhausted before the second question was asked. The first question was stated, and students were asked if they understood the question. They were then requested to brainstorm their answers on what they liked most in terms of the learning experience in *Second Life*<sup>™</sup>. The students were asked to write down as many perceptions as came to mind individually. They were given five minutes to do this. Then, by moving clockwise in the seated group, the students were asked to voice one perception at a time. Their ideas were recorded on a flip chart, and then the next student was asked to do the same. No discussion of ideas was allowed and questions for clarification were avoided. At the end of the discussion circle, the process continued from the starting point of the circle. When any student exhausted all his/her perceptions, his/her turn was cleared by stating *pass*. The process ended when all the students had said *pass*. At this point, a discussion of each idea took place. Duplications were merged and unclear statements were clarified. The students were asked to write down their top three choices of the statements made. They were requested to allocate a 3 to their top choice and a 1 to their last choice. All the scores were added up and they were displayed in ranked order in Table 5.17. The full data set is available in Appendix I. Only the top statements are displayed in Table 5.17.

**Table 5.17: What students liked most in *Second Life*<sup>TM</sup> learning facilitation**

Statement	Score
To explore different learning spaces of <i>Second Life</i> <sup>TM</sup> , the islands and other parts of the world within <i>Second Life</i> <sup>TM</sup> .	22
<i>Second Life</i> <sup>TM</sup> learning saves time, because no travel arrangements to be made and traffic to take into consideration.	15
Learning facilitation in <i>Second Life</i> <sup>TM</sup> does not have that dreary, mundane feeling of the normal, regular class.	10
Learning facilitation in <i>Second Life</i> <sup>TM</sup> brings more confidence to ask questions and give answers because nobody really knows who the people are behind the avatars.	8
To engage in a form of learning in a virtual world.	8
To be able to teleport to anywhere in <i>Second Life</i> <sup>TM</sup> within seconds.	8
To be an active role-player and part of a learning option mediated by a device on the internet.	7

What students liked most during the *Second Life*<sup>TM</sup> learning facilitation sessions are their ability to explore different learning spaces of *Second Life*<sup>TM</sup>, the islands and other parts of the world within *Second Life*<sup>TM</sup>; which is integral to learning. This top-rated statement links with the literature review in section 3.6.4, because some of the discussed benefits of visual experience, synchronous learning, openness, and innovative learning in *Second Life*<sup>TM</sup> comes to the fore in this expression on learning. This top-rated statement also links with the theoretical framework. It relates to the Multimodality Theory in section 2.3.2, whereby sensory observations are made by the students, as well as the adapted Virtual World Adjustment Theory in section 2.4 because of the investigative actions of students during the Orientation and Euphoria phases. This top-rated statement is furthermore in line with the content analysis in section 4.3.6 whereby learning is enhanced with exploration as facilitation method in the world, especially in South America - which is also a developing continent.

The second highest rated statement indicates that *Second Life*<sup>TM</sup> learning saves time, because no travel arrangements had to be made and traffic does not need to be taken into consideration. This statement relates to section 2.6.4 whereby the advantage was highlighted that cost is reduced and students with physical challenges are enabled. This second highest rated statement also links with the theoretical framework of this study. It links with the adapted Virtual World Adjustment Theory in section 2.4 whereby the ability to be part of learning facilitation with significant cost reduction enables the student to

move to the phase of behavioural survival. The student now has the chance to focus on instrumental adjustment and interactive adjustment. Interactive adjustment is associated with Connectivism, as indicated in section 2.3.1. This second highest rated statement also speaks to the content analysis in section 4.3.6 whereby the virtual *Second Life*<sup>TM</sup> learning facilitation methods used for learning globally (in developed and developing continents) are valued student experiences of learning. This sentiment is also shared by this African group.

The third most votes by the students pertain to learning facilitation in *Second Life*<sup>TM</sup> that does not have that dreary, mundane feeling of the normal, regular classes. This third most voted statement connects with the benefits of learning facilitation in *Second Life*<sup>TM</sup> mentioned in section 3.6.4 referring to the collaboration, fun and informal ambience experienced with the mentioned learning facilitation. This third most voted statement carries the Affective Survival of the adapted Virtual World Adjustment Theory in section 2.4 in the expression of their learning perception as liking the informality and counteracting mundane feelings. Ease of Use, from the Technology Acceptance Model as described in section 2.3.3, also shows in the statement of students that these learning facilitation sessions overcome dreariness. This statement also surfaces with the reference to learning facilitation sessions that are not like normal and regular classes. In section 4.3.6, a variety of learning facilitation methods are mentioned that are used in *Second Life*<sup>TM</sup>, together with the global emphasis on non-traditional learning facilitation spaces. The African student voice reiterates the same learning experience preference.

The Nominal Group Technique was also followed to determine the least liked aspects for students who were part of the *Second Life*<sup>TM</sup> learning facilitation. Table 5.18 shows the highest scored perceptions in ranked order of what students disliked most during learning facilitation in *Second Life*<sup>TM</sup>. The complete set of data is available in Appendix J.

**Table 5.18: What students disliked most in *Second Life*<sup>TM</sup> learning facilitation**

Statement	Score
Learning in <i>Second Life</i> <sup>TM</sup> is problematic if you do not have your own device.	12
Struggling to log in and password may be forgotten to enter.	10
Learning facilitation in <i>Second Life</i> <sup>TM</sup> is not interactive enough.	10
It is expensive to buy a device and stay connected.	8
Learning f in <i>Second Life</i> <sup>TM</sup> happens too fast, especially when you type slowly.	8
Avatars are limited to basic actions in <i>Second Life</i> <sup>TM</sup> which makes the experience less exciting.	8
Too technical to be used in combination with learning facilitation in <i>Second Life</i> <sup>TM</sup> .	8
<i>Second Life</i> <sup>TM</sup> learning does not accommodate different social styles.	7

The most disliked about *Second Life*<sup>TM</sup> learning facilitation is that it becomes problematic to learn in this environment if students do not have their own device. This statement is pertinent in Africa and in developing continents where device ownership may be a luxury, and not automatically part of households. This statement of the most disliked links with the challenges of learning facilitation in *Second Life*<sup>TM</sup> mentioned in section 3.6.5 that accentuates it as resource intensive. This statement is furthermore in line with the Pebble-in-the-Pond Instructional Design Model in section 2.3.4 that shows that posing a problem and challenge to overcome, trigger the learning process. The challenge of device ownership in a developing continent thus needs to be solved before Transformative Learning can happen. Transformative Learning occurs only after survival is reached according to the adapted Virtual World Adjustment theory, indicated in section 2.4. Therefore, adequate time must be allowed for students on a developing continent to overcome the metaphorical pebbles in the pond and crisis phases of the adapted theory. Action Learning Action Research is applicable to the process, since students learn from these challenges to eventually survive and reach Transformative Learning.

The most disliked aspect about *Second Life*<sup>TM</sup> learning facilitation, showing the difficulty of students in having the necessary devices to partake in learning facilitation in *Second Life*<sup>TM</sup> in Africa, may be directly linked to the minimal presence in Africa within this domain. This is seen in the data analysis of the higher education institutions globally with an active learning facilitation presence in *Second Life*<sup>TM</sup> in section 4.3.1 where no institutional presence in Africa has been recorded up to date.

The second-most expressed dislike for students about *Second Life*<sup>TM</sup> learning facilitation is that students sometimes struggle to log in and that they forget their passwords. This dislike relates to the challenge mentioned in section 3.6.5 regarding access challenges, technical issues and the digital divide that students experience in a developing continent like Africa. This dislike can be ascribed to the Orientation and Crisis phase of the adapted Virtual World Adjustment Theory as discussed in section 2.4 whereby students need to orientate themselves inworld and adapt on how to log in and enter *Second Life*<sup>TM</sup> learning facilitation. The Pebble-in-the-Pond Instructional Design Model is also relevant, as described in section 2.3.4, whereby a problem or challenge needs to be overcome by students to use the correct password and enter into Transformative Learning. Furthermore, the second-most indicated dislike for students may be because of the low uptake of institutional presence in *Second Life*<sup>TM</sup> from Africa. Students may not be so focused on remembering passwords for learning in *Second Life*<sup>TM</sup> since that is not their present way, or the known way, to learn. Therefore, this institutional absence from Africa as indicated in section 4.3.1, may be a factor leading to log in challenges.

The third-most mentioned statement with regard to learning facilitation in *Second Life*<sup>TM</sup> is that it is not interactive enough for several students. This implies that they prefer the interaction in a real class, with a learning facilitator present. The technology growth gap is too large for them and thus hampering their learning experience. This statement connects with digital divide challenges mentioned in section 3.6.5, together with integrity and authenticity issues mentioned. This third-most mentioned statement relates to the Pebble-in-the-Pond Instructional Design model, as indicated in section 2.3.4 whereby students are faced with a challenge to overcome. In line with the adapted Virtual World Adjustment theory, indicated in section 2.4; these behavioural and cognitive Crises need to be overcome to ensure behavioural and cognitive Survival and eventually Transformative Learning. The lack of higher education institutional presence from Africa as seen in section 4.3.1 may lead students to believe that interaction is more in real life than *Second Life*<sup>TM</sup>. The traditional methods of learning facilitation are known to them and

for this reason critique may be expressed towards higher education learning facilitation in *Second Life*<sup>™</sup>.

The nominal group discussion was followed by the request to students to reflect on their learning experience within *Second Life*<sup>™</sup> by means of an ethnographical narrative. The qualitative data from these narratives are discussed next.

### 5.9.2 Ethnographic narratives by the students

The students were asked to reflect on their learning experience within *Second Life*<sup>™</sup> by means of a written ethnographical narrative each. Of the 25 students who took part in the learning facilitation session, one student had to leave to be in time for taxi-transport to her home. Therefore, only 24 students completed the ethnographic narrative. To guide the reflection of the students, especially if they were uncertain, four questions were displayed on a screen in the computer laboratory. From these questions, the researcher learned about the learning experience of students in this domain. Simultaneously, students also gained insight in their encounter and the facilitation they were exposed to within *Second Life*<sup>™</sup>. The following questions were compiled as critical part of the Action Learning Action Research process of this part of the study:

- 1) *How do you feel about being part of learning facilitation sessions in Second Life<sup>™</sup>?*
- 2) *Do you think you will be able to learn if you attend learning facilitation sessions in Second Life<sup>™</sup>? Motivate your response.*
- 3) *Which learning facilitation mode(s) do you prefer?*
- 4) *What are your comments on the learning in Second Life<sup>™</sup>?*

The narrative reflection of the students is linked to the adapted Virtual World Adjustment Theory in Table 5.19 (See Appendix K). Because the learning facilitation was a new experience for the EALH1508 students at the University of the Free State, it is understandable that their statements link largely to the first two phases of the adapted Virtual World Adjustment Theory, namely the Orientation and Euphoria phases. The answers to the first guiding question in the student ethnographic narratives were

categorised according to broad themes. Each of the written learning experiences in the narrative ethnographies of the students was then categorised according to the themes. The statements and themes are coded with different colours in Table 5.19, with similar colours used for the associated theme.

**Table 5.19 Narrative responses to the question: How do you feel about being part of learning facilitation sessions in *Second Life*™?**

Student	Statement	Theme	Phase of adapted Virtual World Adjustment Theory
A	It feels so good because we are experiencing a different life in a different world. And, at the same time, the life of <i>Second Life</i> is confusing, because that people have wings and they can even fly. The world in there is wonderful because there are mountains, water, oceans and nice buildings. <i>Second Life</i> class is very interesting. I am now <b>learning new things</b> and that makes me imagine the life of <i>Second Life</i> .	<b>New experience</b>	Phase 1 - Orientation Phase 2 - Euphoria
B	I think it is adventurous, <b>fun and exciting</b> .	<b>Fun and exciting</b>	Phase 2 - Euphoria
C	I feel wonderful, because I now experience <b>a different life in a different world</b> meeting people who are different, with different characters. The world in there is good and we get to fly. It's like if we are in heaven with wings, wearing white clothes.	<b>New experience</b>	Phase 1 - Orientation Phase 2 - Euphoria
D	I honestly think that it is a <b>fun experience</b> . I wouldn't mind having some classes in <i>Second Life</i> , occasionally of course. It is so fun that it is somewhat distracting at times.	<b>Fun and exciting</b>	Phase 2 - Euphoria
E	Having a class in <i>Second Life</i> , it's the best. Sharing information via <i>Second Life</i> is the easiest way of attending class and being taught. We get to <b>meet our fellow students</b> and lecturers in <i>Second Life</i> . As far as I can tell, I think it's the best way to attend class.	<b>Interaction with other students</b>	Phase 4 - Survival (Affective)
F	I didn't know about <i>Second Life</i> at all, and I thought it is going to be boring; we were not <b>going to have fun</b> , but it proved me wrong. I know a lot about it already. Even the teacher explained it thoroughly to use so that we understand why we have this experience of <i>Second Life</i> and even how it works.	<b>Fun and exciting</b>	Phase 2 - Euphoria
G	I feel that if we have had a full class on <i>Second Life</i> , like it would have been a new great thing, because I can see that it seems like <b>fun and delightful</b> .	<b>Fun and exciting</b>	Phase 2 - Euphoria
H	It is <b>fun and adventurous</b> .	<b>Fun and exciting</b>	Phase 2 - Euphoria
I	I like it, it was <b>really interesting</b> .	<b>Fun and exciting</b>	Phase 2 - Euphoria

J	It was quite an <b>interesting experience</b> . To be having a class in a virtual world, I really enjoyed it as well as the <b>different</b> kinds of super-powers one has in the virtual world.	<b>New experience</b>	Phase 1 - Orientation Phase 2 - Euphoria
K	I really enjoyed <i>Second Life</i> . I think it would be a great asset to the academic life. We <b>learn faster</b> and it is more interesting. I <b>learned a lot</b> , really.	<b>Learning a lot and enjoyable</b>	Phase 4 - Survival (Cognitive)
L	I feel it would be a great way to have class. It could be beneficiary for us as students when we cannot make it to class due to complications. We can just get access to a computer and go to a virtual class. Secondly, as a person who struggles with <b>social anxiety</b> , it spares me the effort of having to interact with people face to face. You can interact with a lot of people in the comfort of your own space, and you can be anything you want <b>without feeling judged</b> . Anxiety can influence one's education because a lot goes through your mind.	<b>Alleviation of social anxiety</b>	Phase 4 - Survival (Affective and Behavioural)
M	It is a really <b>enjoyable class</b> , reason being that it allows us as student to be more productive.	<b>Fun and exciting</b>	Phase 2 - Euphoria
N	I feel so wonderful because we learned about <b>virtual worlds in the computers</b> .	<b>Virtual world learning</b>	Phase 4 - Survival (Cognitive and behavioural)
O	I enjoy having a class in <i>Second Life</i> , because I think they are worth it. It is quite an experience and <b>different from what we are used to</b> . In <i>Second Life</i> I gained knowledge, or I'd rather say it was a way of viewing or seeing myself from a different perspective and that there are different ways of meeting up with people and importantly, adapting to the new environments and life adventures.	<b>New experience</b>	Phase 1 - Orientation Phase 2 - Euphoria
P	The <b>feeling is so wonderful</b> and good having <i>Second Life</i> in a class.	<b>Fun and exciting</b>	Phase 2 - Euphoria
Q	It is very good about having a class with <i>Second Life</i> , it is <b>an amazing experience</b> .	<b>New experience</b>	Phase 1 - Orientation Phase 2 - Euphoria
R	I feel good about <i>Second Life</i> , because I see that the technology is improving. The <b>learning improvement is high</b> .	<b>Learning a lot and enjoyable</b>	Phase 4 - Survival (Cognitive)
S	<i>Second Life</i> has do well. I feel do well class that I understand (sic) because <b>the lecturers explain to me</b> .	<b>Virtual world learning</b>	Phase 4 - Survival (Cognitive and behavioural)
T	I feel good about <i>Second Life</i> . It helps us to <b>get use with computers</b> .	<b>Virtual world learning</b>	Phase 4 - Survival (Cognitive and behavioural)
U	Having a class in <i>Second Life</i> I feel good because it shows us how to study online with the student that you already have in class, but it shows you that <b>you can communicate with them</b> and even participate in class during the study period.	<b>Interaction with other students</b>	Phase 4 - Survival (Affective)
V	I feel very happy and pleased about having to <b>experience the class</b> in <i>Second Life</i> . I really feel excited at the same time.	<b>New experience</b>	Phase 1 - Orientation Phase 2 - Euphoria
W	At first, it was a bit hard for me, but as the lecturers explained thoroughly the simpler it	<b>Learning a lot and enjoyable</b>	Phase 4 - Survival (Cognitive)

	was for me to <b>understand, and I was then able to work on it.</b>		
X	I feel very proud and excited in having class in <i>Second Life</i> because <b>I learn to explore a different version of learning.</b>	<b>Learning a lot and enjoyable</b>	Phase 4 - Survival (Cognitive)

The majority of the students believed *Second Life*<sup>TM</sup> learning was fun and exciting ( $n = 8$ ; 33%), allowing for a new and interesting experience ( $n = 6$ ; 25%) in *Second Life*<sup>TM</sup>. This was followed by four students indicating that they are learning a lot and find *Second Life*<sup>TM</sup> enjoyable (15%), three students that valued virtual world learning (14%), two students that liked the interaction with other students (9%) and one student that indicated that *Second Life*<sup>TM</sup> learning facilitation decrease social anxiety (4%). The identified themes were each allocated a numerical value, and this nominal data was used to compile the frequency distribution Table 5.20.

**Table 5.20: Frequency distribution table for numerical values of identified themes (Liebenberg, 2022)**

Theme	Allocated numerical value for theme	Intervals	Frequency Distribution
New experience = 2	2	1	8
Fun and exciting = 1	1	2	6
New experience = 2	2	3	2
		4	4
		5	1
		6	3
Fun and exciting = 1	1		
Interaction with other students = 3	3		
Fun and exciting = 1	1		
Fun and exciting = 1	1		
Fun and exciting = 1	1		
Fun and exciting = 1	1		
New experience = 2	2		
Learning a lot and enjoyable = 4	4		
Alleviation of social anxiety = 5	5		
Fun and exciting = 1	1		
Virtual world learning = 6	6		
New experience = 2	2		
Fun and exciting = 1	1		
New experience = 2	2		
Learning a lot and enjoyable = 4	4		
Virtual world learning = 6	6		
Virtual world learning = 6	6		
Interaction with other students = 3	3		
New experience = 2	2		
Learning a lot and enjoyable = 4	4		
Learning a lot and enjoyable = 4	4		

A graphic presentation of the frequency distribution table on the themes highlighted above as to what students positively perceived about learning facilitation in *Second Life*<sup>™</sup> follows in Figure 5.24 below.

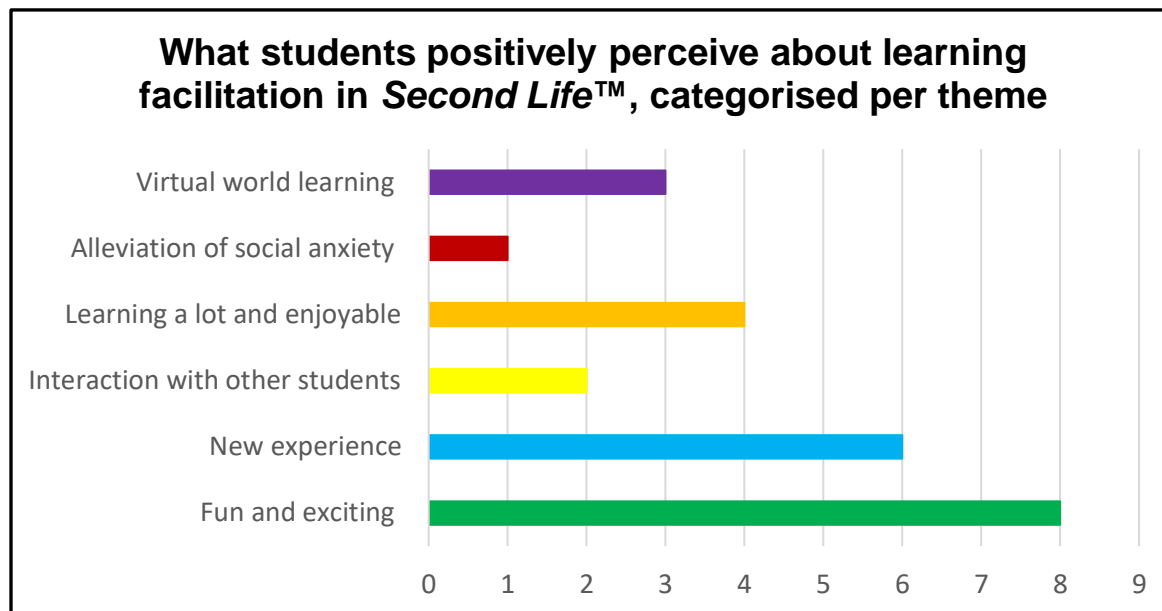


Figure 5.24: Graphical representation of what students positively perceived about learning facilitation in *Second Life*, categorised per theme (Liebenberg, 2022).

Student F expressed the majority perception with the following narrative:

*“I didn’t know about Second Life at all, and I thought it is going to be boring; we were not going to have fun, but it proved me wrong. I know a lot about it already. Even the teacher explained it thoroughly to use so that we understand why we have this experience of Second Life and even how it works.”*

The next guiding question for the student ethnographic narratives focused on the perception of students on their ability to learn in *Second Life*<sup>™</sup> because of learning facilitation inworld. Their responses are noted in Table 5.21 hereafter.

**Table 5.21: Narrative responses to the question: Do you think you will be able to learn if you attend learning facilitation sessions in *Second Life*™? Motivate your response.**

Student	Statement	Yes	No
A	<b>Yes</b> , because the life in there is very nice, because as a person you are able to do anything you want to do.	1	
B	<b>Yes</b> , because it enhances our technology skills. I definitely think I would be able to learn in virtual worlds as I enjoy games like the Sims.	1	
C	<b>Yes</b> , because it's fantastic. We tend to do the things that we do not really do in the real world. We fly, we can see the ocean. It's like we live in heaven; living in the ocean.	1	
D	I certainly think <b>I would</b> . <i>Second Life</i> makes learning even more interactive, in that, now we interact with our environment. I also think that it will encourage some students to improve their English vocabulary and help better our communication skills.	1	
E	<b>Yes</b> , setting different animations and beautiful creatures and colours would make an individual to pay attention and focus in class.	1	
F	I <b>will be able</b> to work in a virtual world. I understand already what it is about, even though there's no sound and communication on my computer. It is fun to just play around with the laptop and learn new things.	1	
G	<b>I think</b> on <i>Second Life</i> personally; for me I will communicate more than in a face-to-face class.	1	
H	<b>Yes</b> , definitely.	1	
I	<b>I would definitely be able to learn</b> in a virtual class.	1	
J	<b>No</b> , I don't. Because I struggle to focus properly on the work.		1
K	<b>Yes</b> , I do. It might be challenging, but I am willing to learn. I am impressed by far.	1	
L	<b>Yes</b> , I think I will be able to learn in a virtual world. Reason why is because a virtual world is fun. It is similar to a game. As a pro-gamer, this is a very lame game but since schoolwork is incorporated in it or integrated in it, it is much easier to remember the bookwork, because it is no longer boring on the basis of just sitting there but more on the basis of the story made of a very nice MMORPG-game. And one always remembers the dialogue in RPGs because they serve as cheers for your next mission. If one envisions the lesson this way, you are bound to remember the work.	1	
M	<b>Yes</b>	1	
N	<b>Yes</b> , because it taught me about many things such as how to create an account for <i>Second Life</i> ; how to chat with my fellow students.	1	
O	<b>Yes</b> , because then I can see everything and if things go wrong, I'll be able to see my mistakes.	1	
P	By <b>learning in a virtual world</b> , I will be able to learn as I am a very virtual person and student - getting to remember quick with virtual.	1	
Q	<b>Yes</b> , it is more convenient I must say to learn in a <i>Second Life</i> . As some work in lecture times, is not well explained like in <i>Second Life</i> .	1	
R	<b>Yes</b> , I think I can because the technology changes day by day.	1	
S	<b>I do not think to learn</b> in virtual world, but I want to clear (sic) virtual world.		1
T	<b>Yes</b> , because it is something that I like and looking forward to knowing it and use it.	1	
U	<b>Yes</b> , I can because I will be able to see my classmate on my computer and also to participate in class and even ask questions because there is a space where you write your message and all students, or my classmates will be able to see it.	1	

V	Yes, I think so, because I can still communicate with my lecturer, and I can also get more information because there will be no minor distractions then.	1	
W	Yes, I get to meet new friends with different perspectives and opinions from mine, and in that I get to learn new information and ideas, and I get to stay informed.	1	
X	I am sure that I will definitely <b>be able to learn</b> from virtual worlds as it is interesting and easy to access.	1	
<b>Total</b>		<b>22</b>	<b>2</b>

The overwhelming opinion of students is that they believe that they will be able to learn if they attend learning facilitation sessions in *Second Life*<sup>TM</sup>. This opinion of the student experience on learning in *Second Life*<sup>TM</sup> correlates with the quantitative pre-test and post-test results in Chapter 5.8.1 that shows that learning did take place because of the learning facilitation sessions intervention in *Second Life*<sup>TM</sup>. The majority, namely 92% of EALH1508 students ( $n=22$ ), believed that they would be able to learn by means of the intervention of learning facilitation sessions in *Second Life*<sup>TM</sup>. Just 8% of EALH1508 students ( $n=2$ ) was not convinced that they would be able to learn by means of the intervention of learning facilitation sessions in *Second Life*<sup>TM</sup>. The pie graph underneath, namely Figure 5.25, shows that the largest share of the student learning experience in *Second Life*<sup>TM</sup> states that learning will occur because of learning facilitation in *Second Life*<sup>TM</sup>.

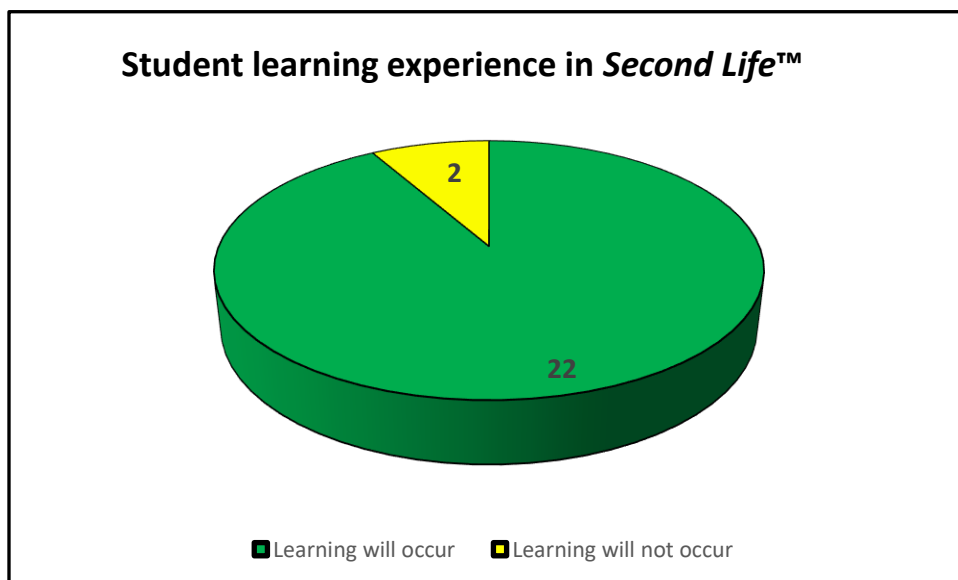


Figure 5.25: Student experience of learning in *Second Life*<sup>TM</sup> (Liebenberg, 2022)

Student E accentuated the majority voice of students believing that learning will take place, with:

*“Yes, setting different animations and beautiful creatures and colours would make an individual to pay attention and focus in class.”*

Student C also confirmed the positive student experience and perception that learning will be possible and happen in this domain:

*“Yes, because it’s fantastic. We tend to do the things that we do not really do in the real world. We fly, we can see the ocean. It’s like we live in heaven; living in the ocean.”*

The following guiding question in the student ethnographic narratives probed for the preferences of the students in terms of the mode of facilitation that they preferred, after they experienced learning facilitation in *Second Life*<sup>TM</sup>. The answers to this guiding question in the student ethnographic narratives were grouped according to three categories. The statements of students are coded according to face-to-face, blended or *Second Life*<sup>TM</sup> learning facilitation preference. Green was used with *Second Life*<sup>TM</sup> preference, red with blended learning and blue with face-to-face learning in Table 5.22. These colours are used in the coding of statements and categories.

**Table 5.22: Narrative responses to the question: Which learning facilitation mode do you prefer? (Liebenberg, 2022)**

Student	Statement	Face-to-face	Blended	Second Life <sup>TM</sup>
A	<b>Virtual world</b> because we can be able to see anything that is happening and it is quite interesting, because that makes learning interesting and I understand better.			<b>1</b>
B	I would prefer <b>blended</b> . Because there might be things that I want to ask or say to my lecturer personally.		<b>1</b>	
C	<b>Virtual world</b> , because in the world we live in it is different to what the virtual world is, and it makes learning interesting and better.			<b>1</b>

D	I prefer <b>blended</b> . As exciting and experimental as it is, I still prefer interacting with people.		1	
E	<b>Virtual world</b> . Because in terms of attending classes, we get (sic) late sometimes. So, in the virtual world I think it's much easier. You just log in and regardless of where you are, you get to attend class and are taught. Immediately, right after class you can log out.			1
F	<b>Face-to-face</b> mode will be good and very understandable to me for the lecturer to explain thoroughly what will be happening and how everything works.	1		
G	<b>Blended</b> , because now and then one feels to have class on the computer if you don't feel like to be around people or if you go talk about a personal problem. I think if someone is a shy person, he/she will prefer to use <i>Second Life</i> , just to escape talking "in front of people" face to face.		1	
H	<b>Virtual worlds</b> because there are some of us who are born shy and are not able to answer questions in the classroom. Virtual worlds will make it easier.			1
I	<b>Face-to-face</b> , because I get the opportunity to interact with other students, create a studying relationship, and get to ask my questions from lecturers where I did not understand it.	1		
J	I would prefer <b>face-to-face</b> classes, because it is better to see the lecturer and the slides. It helps to visually see the work, rather than imaging the work.	1		
K	<b>Face-to-face</b> . I am a bit of an auditory learner.	1		
L	<b>Virtual worlds</b> , because it spares me the effort of interacting with real people and I can be in the comfort of my own room.			1
M	<b>Virtual worlds</b> because it also allows interaction with classmates or other students, if not in a class, and it makes it easier to those who are afraid to talk in class and who are biologically born with a certain disability to quickly share their ideas with whoever is interesting in sharing.			1
N	I can choose <b>blended</b> , because I think it's better because you can do it alone and then if there is somewhere you don't understand the lecturer will come and help me during that specific time.		1	
O	I prefer <b>blended</b> mode because sometimes I might not understand when it's face-to-face but learn much easier and quicker when it's both visual and face to face.		1	
P	I prefer <b>blended</b> - having a lecturer in class and being explained step by step. I get to understand and with virtual, I will remember how things are done and be able to express and comment without people knowing who is it.		1	
Q	<b>Blended</b> . I personally believe that my way of learning will totally change from better to good if I get to be taught in both <i>Second Life</i> and normal lecture class.		1	
R	I think I prefer <b>blended</b> because it won't be easy to start virtual worlds. Even at school I usually use face to face.		1	
S	<b>Blended</b> . I need to attend to my class that has an activity because lecturer informs me.		1	
T	<b>Virtual worlds</b> . It makes things easier for us to learn, helps us to know or to get used to computers.			1

U	<b>Face to face.</b> I prefer to attend class so that the lecturer will be always there to guide me with the work that has to be done during the specific period but if I only use the computer class, I will be somehow confused and be scared to ask for any help but in face to face I can ask lecturer and he can reply on my question.	1		
V	<b>Blended</b> , because sometimes learning via <i>Second Life</i> won't mean I will understand everything so it will be best if sometimes I get to meet with my lecturer and discuss face-to-face.		1	
W	<b>Blended.</b> Because I would be able to ask the lecturer questions that I did not get to ask or what I did not understand in the <i>Second Life</i> .		1	
X	I prefer to attend <b>virtual world</b> . Because it is alternative as I can attend my lectures anywhere. I do not need to be in class if I can't. So, wherever I will have internet access, I will be able to be active on my virtual world and explore the resources.			1
<b>Total</b>		5	11	8

The minority of students, namely 21% ( $n=5$ ), indicated that they preferred only face-to-face learning facilitation sessions. Almost a half, namely 46% ( $n=11$ ) of the students, chose a blended approach to learning facilitation, while one third (33% or  $n=8$ ) opted for exclusive *Second Life*<sup>TM</sup> learning facilitation. This opinion of exclusive learning facilitation in *Second Life*<sup>TM</sup> was a preference for a few students after their short exposure to learning facilitation in *Second Life*<sup>TM</sup>. The blended approach was in the majority. It needs to be remembered that the blended approach also makes provision in the perception of students for learning facilitation in *Second Life*<sup>TM</sup>. A frequency distribution table of the coded categories, filled with nominal data, is given in Table 5.23 below, with a pie diagram representation of the results adjacent to the table in Figure 5.25.

**Table 5.23: Frequency distribution of learning facilitation method preferred by EALH1508 students (Liebenberg, 2022)**

Student	Face to Face	Interval	Frequency Distribution
A	3	1	5
B	2	2	11
C	3	3	8
D	2		
E	3		
F	1		
G	2		
H	3		
I	1		
J	1		
K	1		
L	3		
M	3		
N	2		
O	2		
P	2		
Q	2		
R	2		
S	2		
T	3		
U	1		
V	2		
W	2		
X	3		

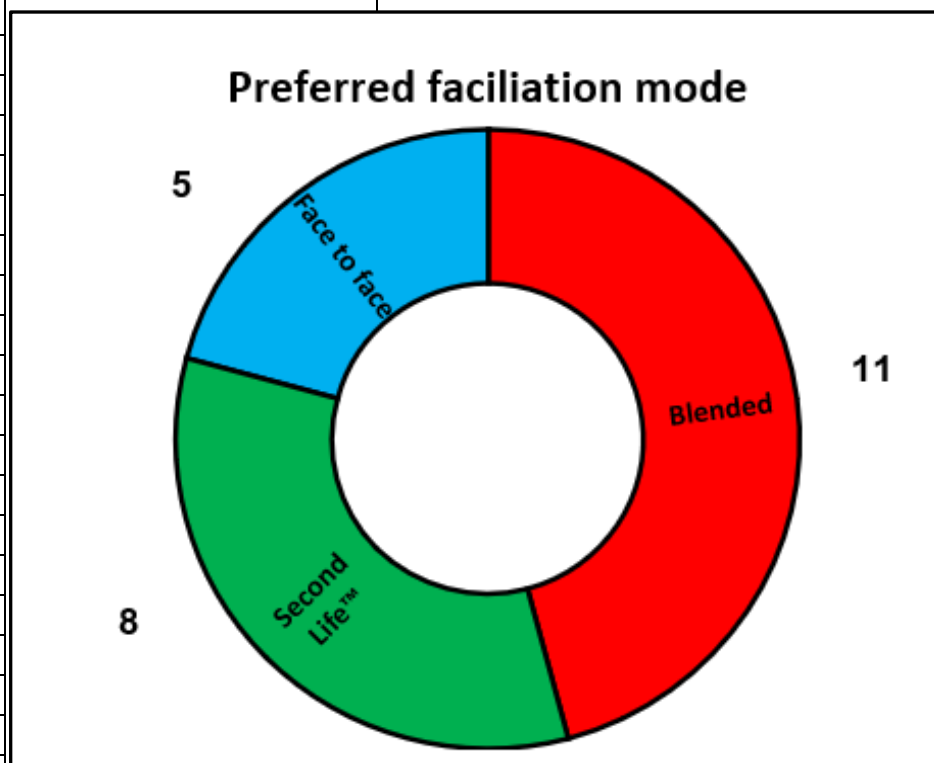


Figure 5.26: Preferred facilitation mode (Liebenberg, 2022)

The nominal qualitative data shows how close the majority vote for blended learning and learning facilitation in *Second Life*™ was. If *Second Life*™ learning facilitation is considered and incorporated within this blended learning interpretation, then the student experience from an African perspective is particularly open to learning facilitation in *Second Life*™.

The preference of student learning facilitation in *Second Life*™ was highlighted by Student E as the following:

*“I prefer a virtual world. Because in terms of attending classes, we get (sic) late sometimes. So, in the virtual world I think it’s much easier. You just log in and regardless of where you are, you get to attend class and is taught (sic). Immediately, right after class you can log out.”*

Students were also requested to add any additional remarks or comments to their ethnographical narratives. Their remarks coincide with the advantages of *Second Life*<sup>TM</sup> mentioned in the literature review in section 3.6.4. They indicated that access to *Second Life*<sup>TM</sup> is possible, irrespective of place and time. This enables learning facilitation from anywhere in the world, especially for students residing anywhere in the world. In terms of the qualitative data gathered on these three elements in the ethnographic narrative of the students, the typical African student experience of learning facilitation in *Second Life*<sup>TM</sup> is that it is exciting and fun. Furthermore, the typical African student believes that learning within the context of *Second Life*<sup>TM</sup> learning facilitation is possible. Even though this is their belief, they do still prefer blended learning. Significant other remarks made by students on learning in *Second Life*<sup>TM</sup> are tabulated in Table 5.24:

Table 5.24: Remarks of students on their learning experience in *Second Life*<sup>TM</sup>

Student	Remark	Interpretation
C	I am <b>grateful</b> to be in this class and we learn more and learn different things. And <b>we learn better</b> .	In these remarks, it becomes clear that students realised the value that <i>Second Life</i> <sup>TM</sup> brings for learning. See all the bold red statements referring to learning. The remarks by students also indicate the Euphoria stage of the adapted Virtual World Adjustment theory, where the focus is on enjoyment and fascination. Both the latter stimulates learning. See the bold blue statements referring to enjoyment during learning facilitation. Elements of the Technology Acceptance Model on usefulness are seen with the statements in the bold green that <i>Second Life</i> <sup>TM</sup> learning facilitation is useful and helpful. The cognitive, affective, and behavioural survival of the adapted Virtual World Adjustment Theory is also present in the remarks of the students that they appreciate it and are grateful (affective) and the saving of time (behaviour and cognitive). These remarks are seen in the bold orange parts in this text. The added Connectivism elements in the adapted Virtual World Adjustment theory is also evident in bold purple remark that students see and interact with other students in <i>Second Life</i> <sup>TM</sup> during learning facilitation sessions.
I	Virtual world is <b>really useful</b> . It also <b>saves you time and travelling</b> to campus all the time and you don't get interrupted by anything.	
J	I <b>really enjoyed</b> the class in <i>Second Life</i> as well as the chatting. Also <b>seeing and meeting new people in the world</b> . I am also very <b>appreciative</b> towards all the people and the helpers within <i>Second Life</i> , and <b>they really helped us</b> .	
O	<i>Second Life</i> is <b>very helpful</b> to students because <b>we enjoy</b> seeing ourselves, and also rectifying our mistakes and to be honest, it <b>taught me a lot</b> .	
V	<i>Second Life</i> is giving us a <b>whole new opportunity to explore</b> teaching and maybe us <b>can use</b> <i>Second Life</i> in future for it is a <b>good way to learn</b> in technology.	

Based on the qualitative and quantitative data analysis of the EALH1508 student experience of learning facilitation in *Second Life*<sup>TM</sup> it can be deduced that learning is

possible in this domain and that students enjoyed the learning experience. In fact, an outspoken preference to investigate this avenue with a variety of learning facilitation methods was recommended. A reflection by the facilitator on his experience of student learning in *Second Life*<sup>TM</sup> follows hereafter.

### 5.9.3 Reflection by the facilitator

The English Academic Literacy EALH1508 facilitator in *Second Life*<sup>TM</sup>, Dr Peet van Aardt, was requested to reflect on the facilitating experience for him as the learning facilitator in *Second Life*<sup>TM</sup> as well as the learning of students in this domain. In his introductory remarks of his reflection, he immediately made it clear that *Second Life*<sup>TM</sup> could change higher education positively. It was his first encounter of *Second Life*<sup>TM</sup> learning facilitating and he remarked, “Wow, this is impressive” (Van Aardt, 2018). This exclamation of him reiterates the Euphoria phase of the adapted Virtual World Adjustment Theory as described in section 2.4. He also enthusiastically stated that he is open to investigate *Second Life*<sup>TM</sup> as a permanent learning facilitation option for his future EALH facilitation. Van Aardt indicated that he was able to use several facilitation methods during his *Second Life*<sup>TM</sup> learning facilitation sessions, and able to see the vast opportunities that *Second Life*<sup>TM</sup> could offer. His only concern was the availability of devices with a stable internet connection for all his students. He cautioned that no one should be left behind in the African context. Van Aardt’s wife is involved in Universal Design for Learning (UDL) and access at the Centre for Universal Access and Disability Support (CUADS) at the UFS.

During his discussions with her concerning his *Second Life*<sup>TM</sup> learning facilitation, he realised the importance of universal design and access for all students to *Second Life*<sup>TM</sup>. Again, he stated that no one must be left behind, but he also mentioned that his short learning facilitation experience with *Second Life*<sup>TM</sup> showed the access possibilities for all. He confirmed that he witnessed learning taking place during the *Second Life*<sup>TM</sup> learning facilitation sessions, as well as with the face-to-face sessions. He accounts for the learning that he encountered based on the answers that students were able to give after the sessions took place. He was impressed with the interaction amongst students and the informal character that the facilitator and student interaction took in the *Second Life*<sup>TM</sup>

learning facilitation space. He concluded his reflection with: “*I will be back in Second Life. See you inworld*”. The last sentence confirms the perception of Usefulness, according to the Technology Acceptance Model (see section 2.3.3), which is built into the adapted Virtual World Adjustment Theory (see section 2.4). The reflexivity that developed, as indicative of Transformative Learning of the adapted Virtual World Adjustment Theory, is also visible in the conclusion of the facilitator’s reflection. Based on this section of the African student experience of learning facilitation in *Second Life*<sup>TM</sup>, the qualitative and quantitative data analysis indicates that learning is possible and students experienced learning during *Second Life*<sup>TM</sup> learning facilitation sessions. Furthermore, the students and the facilitator revealed belief in the viability of this as a learning option in Africa, especially if debate accompanies various learning facilitation methods.

## 5.10 Ethical considerations

For the empirical research described in this chapter, pertaining to the third research question, the learning facilitator, and the students, were briefed on the general nature and purpose of the study (See Appendix E and Appendix F). The complexity of existence in the present reality as well as the *Second Life*<sup>TM</sup> reality was highlighted to make the participants aware of the dualistic and complicated situation which they were to experience. Griefing and harassment were also flagged to warn them in terms of the potential dangers that they may encounter inworld. Axiological considerations, which included griefing, harassment, avatars with hidden agendas and explicit content that may be encountered in the virtual world of *Second Life*<sup>TM</sup> were considered by the researcher by means of a detailed explanation given to the participants in this regard. A step-by-step guide was distributed to students on how to operate and behave in *Second Life*<sup>TM</sup> and explained in person before the research commenced with the steps to follow if confronted by griefing, harassment, avatars with hidden agendas or explicit content (See Appendix D). The confidentiality, with which students’ responses and test scores would be handled, was emphasised. They were also assured that their identities would not be revealed to anyone. Students were also assured that the gathered data will be safeguarded in a locked safe and files that are password protected. The right to withdraw from the study at any time was explained to them. It was emphasised that participation in the study was

voluntary and that refusal to participate would not result in any penalty. Contact particulars to reach the researcher at any time during the research process was also provided. Written informed consent was obtained from every student and the learning facilitator.

## 5.11 Quality assurance

The quality assurance of this study is based on its validity and reliability, which are key to effective research. With qualitative data, validity is addressed by means of depth, honesty, richness of data, the extent of triangulation and the degree of objectivity of the researcher. Credibility is the product of triangulation, because participants or phenomena are evaluated from different angles by means of different data collection and analysis methods. Triangulation validates, deepens, and widens the understanding of the research phenomenon being studied. Quantitative validity is improved by careful sampling, using an appropriate instrument together with statistical validity testing (Cohen, et al., 2017).

The credibility, dependability and trustworthiness pertaining to the content analysis of the data gathered to explore the higher education learning facilitation landscape in *Second Life*<sup>™</sup> (see Chapter 4) was reinforced by the gathering of data from the same group of global universities. Furthermore, trustworthiness, dependability, and credibility with regard to Chapter 5 are vested in a homogenous group of UFS students in terms of their English Academic Literacy proficiency (basic) and year of study (first-year students).

Data from this group was gathered by means of observations, ethnographical narratives, nominal group discussion and test scores. The different research methods (methods triangulation) and angles (analyst triangulation) contributed to the triangulation of data. Together therewith, the same group of students that participated, assisted in eliminating unequal sample sizes, given the context of triangulation (Cohen, et al., 2017).

In this chapter, the external validity or transferability was assured by creating the small-scale project based on the literature review indicators, the theoretical framework considerations, and the data from the content analysis. As part of the small-scale project, the questions in the ethnographical narratives and nominal group discussion were also

derived from the literature review indicators, the theoretical framework considerations and the data from the content analysis preceding the creation and facilitation in this domain. The questions in the pre- and post-tests to students were based on the module content of the students and at least two questions were used to measure a construct (Delpont, 2005).

Dependability rested on the data gathered from two angles, namely qualitative and quantitative. Quantitative data, validated by the Pearson's correlation coefficient, enhanced the qualitative perspectives, and brought a more holistic picture as response to all the research questions in the study. The Pearson's correlation shows that a stronger correlation is visible between the pre-tests and post-tests of *Second Life*<sup>TM</sup> learning facilitation ( $\Upsilon = 0.085$  and  $\Upsilon = 0.042$ ) than to face-to-face learning facilitation sessions ( $\Upsilon = 0.0097$ ). The first Pearson correlation of 0.085 means that there is only an 8.5% chance that the results of learning occurred by chance. For the second Pearson correlation of 0.04 there is only a 4.2% probability that the results of learning occurred by chance. For the face-to-face learning session with a Pearson correlation of 0.009, there is only a 1% chance that the results of learning occurred by chance.

Reliability in this chapter pertaining to the third research question, as well as in the previous chapter, is based on the presence of the researcher in the gathering of data from universities globally and using a content analysis research methodology approach whereby she remained involved. The same researcher was also part of the preparation, creations, facilitation, and post-facilitation data gathering and analysis with the setting up of a small-scale project of learning facilitation in *Second Life*<sup>TM</sup> at an African university on a developing continent. The researcher stayed a constant and consistent research approaches and methodologies could thus be used. Reliability was further ensured by the qualitative and quantitative research approaches that were considered independent of each other. The data sets, coming from the two research approaches, were integrated, and triangulated with the interpretation of the data. Data was validated after each type of data gathering process during the data collection phase by means of data type, range, and consistency. The questions in the pre- and post-tests to students were based on the

module content of the students and at least two questions were used to measure a construct (Delport, 2005). Reliability and internal consistency of the quantitative test data of students for the three tests was validated by Cronbach's Alpha. The Cronbach  $\alpha$  value of 0.953535 was calculated with Excel360 statistical VAR.P functions. The values calculated was inserted in the formula:

$$\alpha = \left( \frac{k}{k-1} \right) \left( 1 - \frac{\sum_{i=1}^k \sigma_y^2}{\sigma_x^2} \right)$$

Number of questions	10
Sum of variances	3.538752
Variance	24.95274
Cronbach's $\alpha$	0.953535

Therefore, Cronbach Alpha shows this tests items as strongly internal consistent and thus reliable. Furthermore, the study is deemed credible because the qualitative research part of this chapter does not attempt to generalise findings because of relatively small sample sizes.

Dependability relies on a comprehensive data set. Sufficient details and information need to be gathered. In this study, the appendices contain large data sets. Substantial quantities of data were gathered in this study. In the chapters, summaries of the large data sets are presented. Confirmability requires that other researchers should be able to replicate the results of the study if they repeat a similar study. This is proposed specifically in Chapter 6 to exclude bias as far as possible. The data methods in this study are described in a transparent way for any other researchers to replicate. It is believed that the measures used in this study will capture the same concept consistently over time, produce similar results in different contexts and gauge the concept of learning via questions. This will support the statement of confirmability.

A praxiological consideration was taken into account regarding the third research question data collection and analysis. Participants in this study are higher education

students who are registered at their higher education institution, namely the UFS. Their purpose is to learn and obtain their degrees. But to learn in a virtual world in Africa, namely at the UFS *Second Life*<sup>™</sup> learning facilitation space, is new, atypical, and not familiar to these students. This may gravitate student participants to explore this virtual world and may deflect their attention from learning.

## 5.12 Conclusion

This chapter answered the third research question on the learning experience in a *Second Life*<sup>™</sup> classroom of the University of the Free State. By means of Action Learning Action Research the researcher gained insight into the unfolding knowledge. Triangulated quantitative and qualitative data was collected, integrated, and interpreted. An African student body, with the insights from the African Theory of Knowledge, contemplated the importance of orientation - for students, facilitators and ICT support. The digital strangers showed their ability to learn in this domain, but pointed out how device ownership is a significant factor to remember on this continent when learning facilitation in *Second Life*<sup>™</sup> is considered. The students and facilitator stressed the importance of connections, discussions, debates and engagement amongst avatars, their *Second Life*<sup>™</sup> environment and the artefacts therein for learning to occur in *Second Life*<sup>™</sup>. This viewpoint links to the Connectivism concepts built into the adapted Virtual World Adjustment Theory.

Learning was shown not to be far-fetched on this continent with its student body, because the pre- and post-test scores of the sample signified that learning did occur based on learning facilitation that happened at a UFS classroom in *Second Life*<sup>™</sup>. Furthermore, the creation of a learning facilitation setting from this continent in the global domain was shown to be possible, signalling that the gap of Africa not being present in this domain can be filled. The importance of planning, creation, and orientation before higher education institutions in Africa embark on actual learning facilitation in this domain, was shown by this part of the study as pertinent. If these pillars are not in place, then this may affect the eventual learning experience and deep learning of students negatively.

Ethical considerations and quality assurance concluded the chapter. In the following chapter, markers to contribute to reshaping higher education learning facilitation in a developing continent through *Second Life*<sup>™</sup> will be presented. Grounded Theory is a result, because novel conceptualisation flows from the coded qualitative and quantitative categories in this study. This chapter will also include the reflection by the researcher, recommendations, and contribution of the study to research knowledge.

# CHAPTER 6

## REFLECTION, RECOMMENDATIONS AND CONCLUSION

### 6.1 Introduction

This concluding chapter reflects on the preceding chapters and proposes markers to contribute to the reshaping of higher education learning facilitation in the *Second Life*<sup>™</sup> domain in a developing country. The narrative reflection by the researcher in this chapter revisits the adapted Virtual World Adjustment theory; the key features of learning facilitation in *Second Life*<sup>™</sup>, globally; and the learning experience of EALH1508 students at the University of the Free State in Africa during learning facilitation sessions in *Second Life*<sup>™</sup>. The reflection by the researcher is dialectic because it focuses on the internal thoughts of the researcher on the external experiences that she encountered in the situation of which she was part. Reflection plays a critical role in Action Learning Action Research, because reflection after planning, action and evaluation usually leads to a vision that starts a new cycle of learning. After the reflection, the researcher proposed markers.

Recommendations follow the researcher's reflection and proposed markers. Recommendations are aimed at higher education institutions in general, and at the University of the Free State, specifically. They serve as an integrated, culminative response to the last research question, namely: What markers can be proposed to effectively facilitate learning in a *Second Life*<sup>™</sup> classroom at an African University? Future research possibilities are also proposed. The chapter concludes with the limitations of the study, as well as the contribution that this study makes to the body of knowledge on higher education. With this conclusive chapter, the aim of the study is reached.

## 6.2 Reflection on the literature review

In this section, the researcher reflects on the literature review. The literature review revealed that the marginalised, which are often associated with developing continents, are uplifted within *Second Life*<sup>TM</sup> and become equal to everyone else (see section 3.6.4.11). Therefore, *Second Life*<sup>TM</sup> acts as a leveller and creates the foundation for equitable higher education learning facilitation, worldwide. The literature review showed that the digital divide in developing continents might negatively affect fluent functioning during learning facilitation in *Second Life*<sup>TM</sup> (see section 3.6.5.8). For digital strangers and digital immigrants, it requires concerted efforts to learn and facilitate in *Second Life*<sup>TM</sup>. Digital strangers could be assisted with additional sessions, which could help them gain self-confidence in *Second Life*<sup>TM</sup> and improve their learning ability.

For Africa, higher education learning facilitation presence in *Second Life*<sup>TM</sup> will have the extra benefit that people from remote areas, or adults who did not previously have the opportunity to engage in traditional higher education learning facilitation systems, would be to attend classes and learn inworld.

Chapter 3 responded to the issue of access to higher education by showing how access becomes possible for those who meet the entry requirements to higher education, even if students are stationed in deep rural areas on a developing continent. This chapter also showed that students at higher education institutions have access to *Second Life*<sup>TM</sup> without cost and subscription fees. For a developing continent, this means that equal access to higher education learning facilitation is possible and debate options with students all over the world is opened. Furthermore, no cost discrimination exists based on the type of the institutions and equal access is present. Costs that are to be incurred are expenses towards study fees at the higher education institutions where the student avatars are enrolled, may the higher education institution be private or public. There are also data costs associated with this learning facilitation, but *Second Life*<sup>TM</sup> demands relatively little from device systems. At most South African universities, registered students have unlimited data allocation (TUT, 2022; UFS, 2022; Unisa, 2022). Therefore

access to learning facilitation in *Second Life*<sup>TM</sup> may be possible for enrolled students at universities in South Africa without any additional data costs.

The literature does not elaborate on the size of the higher education institutions that are present and successful with learning facilitation in *Second Life*<sup>TM</sup>. For that reason, in Africa, the size of higher education institutions on this developing continent should not be a limiting or demarcating factor if this learning facilitation is planned at higher education institutions. In the literature, there are no concerns raised that set limitations for planned learning facilitation and learning in this domain. But, based on the gap in the literature on the average size of higher education institutions that are successful in learning facilitation in *Second Life*<sup>TM</sup> and the foreseen impact for Africa, this phenomenon was investigated globally in Chapter 4.

The literature review (Chapter 3) showed that the classroom setting of higher education institutions plays a very important role in learning. *Second Life*<sup>TM</sup> learning facilitation spaces should be conceptualised for the co-creation of artefacts and objects, inviting communication and lively interaction. Notecards, voice chats, contextualised signs by means of video, audio and animated content, a relaxed space, the experience of new cultures and learning communities is said to contribute to learning in *Second Life*<sup>TM</sup> (see section 3.6.4.5). The experience in *Second Life*<sup>TM</sup> is visceral and engaged because avatars see their facilitators, peers, and themselves within the learning facilitation situation. Engagement among facilitators, peers and students has a positive effect on learning. Hence, *Second Life*<sup>TM</sup> learning facilitation spaces should not be seen as replicas of face-to-face lecturing and facilitators must guard against the replication of the dynamics of traditional classrooms. For a developing continent embarking on learning facilitation in *Second Life*<sup>TM</sup>, this means that semi-traditional or non-traditional learning facilitation spaces are advisable. But the known security of the traditional classroom setting also needs to be kept in mind, if the culture shock experienced by students in virtual learning settings mentioned by Fizsimons (2012) is acknowledged. Therefore, based on the literature review and the implications for African learning facilitation spaces, the question was explored in Chapter 4: What type of learning facilitation spaces are used by higher

education institutions globally that facilitate successfully in *Second Life*<sup>TM</sup>? (see section 4.3.4).

It was seen that the type of subject fields that are usually presented by higher education institutions in *Second Life*<sup>TM</sup> stretch over the whole spectrum of subject fields available in the higher education sector in general. These subject fields range from medicine, nursing, dietetics, genetics, psychology, language and literary studies, law, the arts, computer programming, archaeology, space, criminology, religious studies, law enforcement, e-commerce to tourism. For Africa, this means that those higher education institutions that embark on learning facilitation in *Second Life*<sup>TM</sup> should not limit themselves to just certain subject fields. Learning facilitation can be undertaken in any subject field on a developing continent. To confirm the stance of literature, Chapter 4 investigated the subject fields that are facilitated by higher education institutions globally in *Second Life*<sup>TM</sup>? (see section 4.3.5).

The literature review in Chapter 3 showed that students value learning facilitation methods that relay interesting, enriching, organised and informative content, leading to the useful application thereof (see section 3.6.4.7). The value of the useful application of knowledge is also indicated by the adapted Virtual World Adjustment Theory (see section 2.1). Students appreciate learning facilitation methods in *Second Life*<sup>TM</sup> with an element of fun and entertainment. This motivates them to learn. Students value teamwork and group work, because insights are created and reinforced by these activities, which align to social constructivism. Engagement, interaction amongst students and with their facilitators, global communities, personalised learning environments, shared experiences and instant feedback in this setting are also perceived as aiding them to learn (see section 3.6.4.12). Learning facilitation in *Second Life*<sup>TM</sup> by means of simulations, experimentation and demonstrations provide a safe environment where students can experiment without risk of harming anybody and the ability to learn by correcting their mistakes. In *Second Life*<sup>TM</sup> the traditional classroom facilitation methods must occupy a small space of the whole facilitation context and must be coupled with debates and discussions. Seminars and video streaming also need to be followed by debates, identity reassignment activities

and discussions to ensure maximum learning. Because of the mutual experience while co-constructing in shared space, debate and discussion is stimulated and lies at the heart of learning in *Second Life*<sup>TM</sup>. Constructive, authentic, and collaborative learning facilitation, which is problem-, scenario- and project-based, are thus the best methods and optimal for learning facilitation in *Second Life*<sup>TM</sup>. For Africa, this means that authentic African collaborative learning, as experienced in person, as indicated by the African Theory of Knowledge in section 2.2.3 needs to be kept in mind when learning facilitation methods are chosen. The importance of debates and discussion in *Second Life*<sup>TM</sup> as learning facilitation method within African universities needs to be noted. To integrate the literature with the African context regarding the type of learning facilitation methods used in the world, content analysis was undertaken in Chapter 4 to determine the learning facilitation methods used by higher education institutions globally that facilitate in *Second Life*<sup>TM</sup>.

From the literature review synthesis, a framework was created by the researcher for higher education institutions in Africa on what to keep in mind when setting up learning facilitation spaces within *Second Life*<sup>TM</sup>. This framework argues for the buy-in and approval of top management; adequate technological infrastructure and support; acquired land, security explanations to students and what to do if breached; orientation of students; registration of students; orientation of facilitators; considerations regarding learning facilitation space design and a pedagogical planning process to precede course design. If a decision is taken by higher education institutions in Africa to proceed with the setting up of a learning facilitation space in *Second Life*<sup>TM</sup>, a framework was suggested to follow to ensure a fluent process and transition.

Therefore, based on the literature and considerations therein, a checklist was compiled on EvaSys, research software for online surveys, by the researcher to inform the decisions to be made in the creation of a learning facilitation space in *Second Life*<sup>TM</sup> for universities in Africa, and especially for the University of the Free State. See Appendix L showing the online checklist, which is available at <https://surveys.ufs.ac.za/evasys/online.php?p=PFMAS> and is open to anyone receiving

this link. This checklist may also be used by other higher education institutions in Africa that want to set up higher education learning facilitation spaces in *Second Life*<sup>TM</sup>.

The structure and framework of courses, just as with face-to-face learning facilitation, need to be planned and in place for learning facilitation in *Second Life*<sup>TM</sup>. A checklist for proper planning and design of courses for learning facilitation in *Second Life*<sup>TM</sup>, based on the work of Savin-Baden (2010), was proposed in this study in section 3.6.6.6 in Figure 3.8. Herein preparatory questions are included on the subject matter; knowledge to be acquired; who the students are and what is required of them before they can commence; student numbers; the role of the learning facilitator; time needed for the learning facilitation sessions; level of the module to be presented; most suitable learning activities; theories underpinning the course design and if course designers were briefed on the skills to be acquired.

With the creation of courses, it is further proposed that an orientation manual be compiled for students who venture into learning facilitation in *Second Life*<sup>TM</sup> at higher education institutions in a developing continent, such as Africa. Based on the synthesis of the literature review, a Table of Contents was compiled for a proposed manual for learning facilitators to orientate students in *Second Life*<sup>TM</sup> and was proposed in section 3.6.6.10 in Figure 3.9. The Table of Contents deals with download; access; avatar selection; avatar modification; communication; navigation; keyboard shortcuts; teleporting; groups and harassment deflection.

Based on the literature review, the suggestion is made to create a one-pager with frequently asked questions and their answers. This will serve to assist with the orientation of students; for example, what to do if you get lost, or want to know where debate and discussion spaces are, or if passwords are forgotten. It is also recommended that students receive printed and electronic manuals before they enter these learning facilitation sessions, with a chapter especially focusing on what learning means in a *Second Life*<sup>TM</sup> learning facilitation space and how to optimise learning when students engage in this type of learning.

### **6.3. Reflection on the exploration of the landscape of learning facilitation in *Second Life*<sup>TM</sup>**

This reflection is linked to the second objective of this study; namely, to perform a document analysis to determine globally the key features of higher education learning facilitation through *Second Life*<sup>TM</sup>.

In summary, the global context of learning facilitation in *Second Life*<sup>TM</sup> is vested in North America, a developed continent, with the overwhelming number of universities worldwide engaging in this domain. Medium-sized public universities lead the learning facilitation engagement in *Second Life*<sup>TM</sup> globally, with mostly non-traditional classroom design. Despite this design preference, these universities predominantly still follow traditional lecture facilitation methods although they also use collaboration and exhibitions as facilitation methods. The subjects that are mostly facilitated by these institutions globally are higher education and research. The African university, namely the University of the Free State where the research for this study was done, is similar in several ways to the global picture of universities where learning facilitation in *Second Life*<sup>TM</sup> happens. The University of the Free State is also a public, medium-sized university. This makes the context of the research suitable for comparison between a developing continent, Africa, and the global picture with a developed continent at the front. Just as most universities worldwide do, this study used traditional facilitation, collaboration, and exhibitions as methods to enhance learning in the classroom of the small-scale project. Contrary to the worldwide picture, a traditional classroom design was followed to include known aspects for students. Undergraduate students constituted the research population. Therefore, the same subject fields as used by the majority of global universities were not focused upon in this research, because higher education and research fall outside the scope of first-year subjects at the University of the Free State.

The analysed data from the global context is meaningful for African higher education institutions because this is the continent where *Second Life*<sup>TM</sup> higher education learning facilitation still needs to be implemented. Furthermore, the implementation of learning

facilitation in *Second Life*<sup>TM</sup> on this continent needs to support deep learning. The predominance of public universities engaging in learning facilitation in this domain globally shows that these initiatives do not need to be driven by private universities, also in developing continents. From the content analysis, showing that this learning facilitation is mostly happening at medium-sized universities, this also carries a message for this university that it has the potential of learning facilitation in this domain.

A variety of subject fields are visible globally in terms of what is being facilitated. Therefore, the subject fields for implementation on this developing continent are open and flexible. There is a visible gap between literature guidance and what is being practiced in terms of the predominant learning facilitation methods at higher education institutions in the world in *Second Life*<sup>TM</sup>. Traditional lecturing in virtual classes is often happening rather than debate and discussions after simulations and experimentations. There are creative avenues of learning facilitation methods that can be explored, contributing to the academic freedom of higher education.

## **6.4 Reflection on the adapted Virtual World Adjustment Theory**

The reflection on the adapted Virtual World Adjustment Theory is associated with the first objective of this study (see section 1.3), how relevant concepts of online learning theories can be integrated with the Virtual World Adjustment Theory towards developing markers to reshape higher education learning facilitation in a developing continent through *Second Life*<sup>TM</sup>. The Virtual World Adjustment Theory consists of five phases, namely Orientation, Euphoria, Crisis, Survival and Transformative Learning. The theory was adapted to indicate the repetitive and continuous nature of learning. Concepts from Multimodality Theory, Connectivism, the Technology Acceptance Model and the Pebble-in-the-Pond Instructional Design Model relating to the Virtual World Adjustment Theory were added to this theory to bring learning into motion and align this theory with the process nature of learning.

Learning is an active process according to Constructivism rather than stagnant steps. The adapted theory has arrows, showing the motion and cyclical nature of virtual learning. It also connects the end result of Transformative Learning into the Orientation phase of a new cycle of learning. Students must collaborate and interact, as stressed by concepts of Connectivism included into the adapted theory to ensure learning. The highly valued visual experience of learning facilitation in *Second Life*<sup>TM</sup> is linked to learning according to Multimodality Theory and therefore included in the adapted theory. The Pebble-in-the-Pond Instructional Design Model shows how a problem posed to students to learning in a different reality activates the learning process. The Technology Acceptance Model concepts of Ease of Use and Perceived Usefulness of the learning to happen in this domain and eventually lead to Transformative Learning. The adapted concepts of relevant online theories added motion and the process nature of learning to the original Virtual World Adjustment Theory. Therefore, the knowledge base of understanding learning in *Second Life*<sup>TM</sup> was extended.

## **6.5 Reflection on the creation and exploration of the learning facilitation experience in a *Second Life*<sup>TM</sup> classroom**

The reflection as part of the Action Research cycle connects with the third objective of this study; namely, to reveal the learning facilitation experience through the creation of a small-scale project in *Second Life*<sup>TM</sup> in a developing continent. The conclusion is made that deep learning is possible in this domain, especially if the known is acknowledged and a variety of learning facilitation methods used. The adapted Virtual World Adjustment Theory was applied within learning facilitation sessions in *Second Life*<sup>TM</sup> within the created small-scale project at the University of the Free State, an African university on a developing continent. The inclusion of the African view of knowledge in the theoretical framework (see section 2.2.3) provided a valuable African perspective in the interpretation of the data. The new insights gained and the recommendations for the markers illustrate the element of Grounded Theory embedded in the theoretical framework of the study.

The Action Learning Action Research-guided design provided clear signposts in the form of the phases of planning, acting, evaluating, and reflecting followed in this project. The

recognition of Action Learning as learning from experience, guided by the asking of critical questions, provided insights on the learning experience of the role players.

The positive student learning experience in *Second Life*<sup>TM</sup> is visible and expressed by the EALH1508 students, but their blended learning preference is also noted. From the comments of students in their ethnographic narratives, the importance of a facilitator in real-life must be kept in mind. Device and login issues were noted by students during the Nominal Group Discussion as the most problematic to get used to.

The creation of a learning facilitation space in *Second Life*<sup>TM</sup> as a metaphorical pebble led to learning according to students' ethnographic narratives. This concept was added from the Pebble-in-the-Pond Instructional Design Model to the adapted Virtual World Adjustment Theory. The importance of the integration of visual, hearing, and tactile senses as part of the orientation of students is stressed by the Multimodality Theory and was incorporated in the adapted Virtual World Adjustment Theory during the Orientation phase. During the orientation class, students were given time to explore *Second Life*<sup>TM</sup> on their own and their remarks on the environment coincides with the Euphoria phase of the adapted Virtual World Adjustment Theory. During this phase, students often realise the Ease of Use of *Second Life*<sup>TM</sup>, once orientated. This is the reason for the incorporation of the Technology Acceptance Model in adapted Virtual World Adjustment Theory.

The students experienced a cognitive crisis, which is also indicated in the adapted Virtual World Adjustment Theory, when the pre-test was given to them and with the realisation of their lack of knowledge on report writing and the Logic Tree. They compared themselves to others, uncertain if they are performing at the same level, showing the role that Connectivism plays even during the Crisis phases of this theory. During the learning facilitation session, it happened that a griefer entered the class and disturbed the class by teleporting some of the objects out of the class. Their reflection in the ethnographical narratives reveals that Affective crises happened within them because they pondered on their relation to the griefer as well as how it will affect their own learning, as well as the learning of their fellow-students. This shows the importance of Connectivism during the

Crisis phases of the adapted Virtual World Adjustment Theory. The ethnographical narratives also showed that the students were not certain if their behaviour was adequate in terms of the report writing and the Logic Tree during the learning facilitation in world within a classroom setting, engaging with video materials and exhibitions. Again, Connectivism comes to the fore during the Behaviour Crisis phase of the adapted Virtual World Adjustment Theory.

The scores on the three post-tests given to students after the learning facilitation in face-to-face learning facilitation spaces, as well as in *Second Life*<sup>TM</sup>, shows that learning took place. In line with the Technology Acceptance Model, students acknowledged the usefulness of learning facilitation in *Second Life*<sup>TM</sup> for learning. These concepts are coupled with the cognitive survival phase of the adapted Virtual World Adjustment theory. The remarks of gratitude and appreciation by students in their ethnographic narratives show their appreciation of networking with others. This concept shows the importance of Connectivism during affective survival shown in the adapted Virtual World Adjustment Theory. It was indicated by students that they related to others during the learning facilitation sessions in *Second Life*<sup>TM</sup> and others also helped them to find their way during the learning facilitation sessions in *Second Life*<sup>TM</sup>. Again, this concept of Connectivism plays a crucial role during the Behaviour Survival phase of the adapted Virtual World Adjustment Theory. The increase in test scores of students after learning facilitation happened, highlights the occurrence of Transformative Learning with the adapted Virtual World Adjustment Theory.

## **6.6 Markers to reshape higher education learning facilitation in Africa through *Second Life*<sup>TM</sup>**

Proposed markers, showing the route to reshape higher education learning facilitation in a developing continent by means of *Second Life*<sup>TM</sup>, were created from the exploration in the literature review, the adapted Virtual World Adjustment Theory, the content analysis of the key features of higher education learning facilitation in *Second Life*<sup>TM</sup> globally and the creation of a small-scale project at a university in a developing continent. These markers are stipulated in Figure 6.1 below and discussed thereafter.

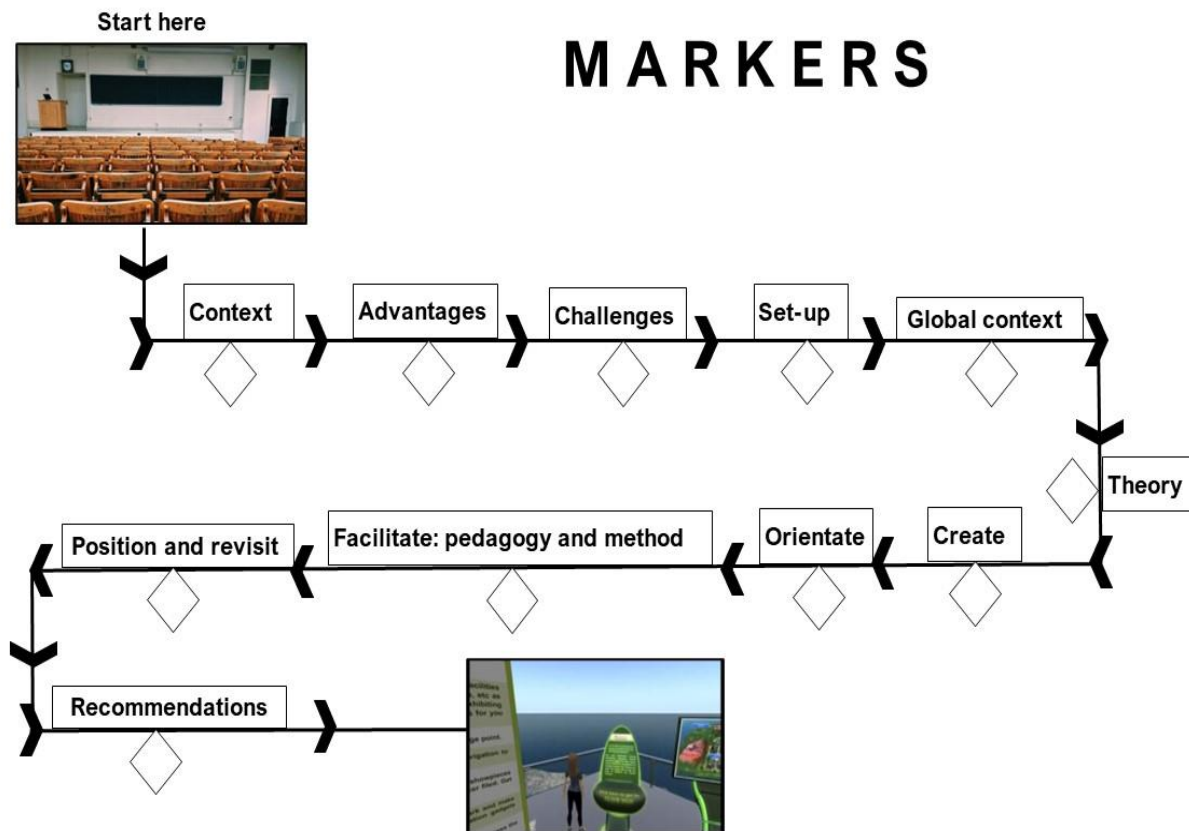


Figure 6.1: Markers to reshape higher education learning facilitation in a developing continent using *Second Life*<sup>™</sup> (Liebenberg, 2022)

The markers to reshape higher education learning facilitation in a developing continent with the use of *Second Life*<sup>™</sup> are recommended to be followed in the progressive order depicted in Figure 6.1. These markers are described below.

**Context**      The context of technologies transforming higher education, the technology context for higher education facilitation in Africa with specific reference to infrastructure, access, and the digital strangers specific to this developing continent need to be considered continuously throughout the proposed reshaping process.

**Advantages** Advantages of learning facilitation in *Second Life*<sup>TM</sup> specific to Africa is the synchronous availability of learning facilitators, irrespective of where they reside; cost reduction; co-construction as valued highly in Africa; the upliftment of the marginalised and improved learning. When learning facilitation is designed, the optimisation of these advantages must be focused on. This is very important in developing continents.

**Challenges** Challenges of learning facilitation in *Second Life*<sup>TM</sup> specific to Africa include the steep learning curve for new avatars since this will be a new development on the continent. Technical challenges on this continent are real and therefore need to be considered when planning is done for learning facilitation in *Second Life*<sup>TM</sup>. On this continent, the financial, creation and design resources need to be available to enable institutions to start. The need for a student to own a computer, or a similar device is often an issue and this needs to be considered during planning stages. Access challenges are also pertinent because of a lack of network availability and stability on this developing continent. Digital divide hindrances also need to be remembered and facilitators must be cautious not to commence with learning facilitation in *Second Life*<sup>TM</sup> when students enter university for the first time.

**Set-up** The question must be raised if technological infrastructure is adequate to host learning facilitation sessions in *Second Life*<sup>TM</sup>. This may be determined by geo-mapping at application stage. Therefore, implementation of learning facilitation in *Second Life*<sup>TM</sup> at an institution is only possible if top management supports it. This is an initial and necessary step, leading to ICT becoming a supportive partner. When courses are designed for *Second Life*<sup>TM</sup> in Africa, from Africa, keep the wisdom of the continent embedded in the course design – to bring the familiar to the student in the unfamiliar. When course content is planned, keep it applicable to the continent within the wider world. With hacking and grieving

challenges, the security of students and the learning facilitator, as well as marks generated on this platform, need to be handled with high priority.

- Global Non-traditional classrooms are setting the pace in *Second Life*<sup>TM</sup>. If students are new to learning facilitation in *Second Life*<sup>TM</sup>, begin with more traditional facilitation as most universities in *Second Life*<sup>TM</sup> did, but then move to exhibitions and debate. Bring variety into facilitation methods in *Second Life*<sup>TM</sup>, as the global picture portrays. Progressively move to non-traditional classrooms as an institution.
- Theory During the learning facilitation session, allow for the phases of the adapted Virtual World Adjustment Theory to build on one another to lead to Transformative Learning. New cycles of learning should be based on the previous cycles to lead to Transformed Learning.
- Create Creation of the interior design of learning facilitation spaces of a campus in *Second Life*<sup>TM</sup> must be influenced by the variety of learning facilitation methods that are available. The creators of learning facilitation space on *Second Life*<sup>TM</sup> islands must be orientated on the openness and flexibility of the facilitation and key learning facilitation features that Millennial and Generation Z students value, as indicated also in this research. Building design and architecture must not be the driving force in learning facilitation space creation, but rather the interior or openness that relates to the learning facilitation methods.
- Orientate Orientation to students is critical for learning facilitation. Orientation for learning facilitators and ICT Service must also be included in the orientation program.
- Facilitate: Action Learning Action Research shows that Action Learning is crucial to ensure learning in this domain. This pedagogy should be built into Pedagogy

and methods facilitation methods in *Second Life*<sup>TM</sup>, meaning students must learn through experience and own actioning. Within a developing continent, such as Africa, it is very important to keep the way that knowledge is created in terms of the African Theory of Knowledge in mind. Knowledge is acquired by students by means of the lived experience according to this theory. Therefore, this pedagogy needs to be converted to, for example, exhibition encounters and simulated environments for students. The adapted Virtual World Adjustment Theory incorporates the Multimodality Theory, which states that as many as possible senses should be considered for learning. This theoretical pedagogy must be applied with the facilitation methods inworld that will require students to listen to sounds, look at representations of what is to be learned and use haptic devices; if affordable.

Connectivism, which is also integrated in the adapted Virtual World Adjustment theory stresses the importance of networks to be present and continuously evolve, to ensure learning. This pedagogy should play out in facilitation methods of group work, debate and discussions on information that needs to be acquired. Engagement between avatars and artefacts as well as avatars and learning facilitators should be built into learning facilitation pedagogy and application.

Also embedded in the adapted Virtual World Adjustment Theory, the Pebble-in-the-Pond Instructional Design model advocates the commencement of the learning facilitation process by means of a problem that is presented. A learning facilitation method to be used in *Second Life*<sup>TM</sup> learning facilitation will, for example, mean that DNA strings need to be re-organised according to its correct structure. All these concepts of online learning theories set the adapted Virtual World Adjustment theory into cyclical motion.

Methods for learning facilitation in *Second Life*<sup>TM</sup> must not merely be a duplication of real-life learning facilitation in traditional classrooms. Explore a variety of methods to build on knowledge and let students explore until they construct meaning, with others. Allow time for students to reach and grow into the stage of Ease of Use and Usefulness, according to the Technology Acceptance Model, which is also integrated in the adapted Virtual World Adjustment Theory and the Survival phase of this theory.

Position and revisit Hybrid learning facilitation is important for students from Africa. Therefore, position *Second Life*<sup>TM</sup> learning facilitation very carefully when decisions are made. *Second Life*<sup>TM</sup> learning facilitation success depends on revisiting the learning facilitation space, design, and activities continuously. But learning is possible in *Second Life*<sup>TM</sup>, which opens the possibilities for higher education learning facilitation in *Second Life*<sup>TM</sup> on a developing continent.

Cognisance was also taken of the limitations regarding this study. The limitations are listed in the section below.

## 6.7 Limitations of the study

The limitations of this study are the following:

- The creation of a small learning facilitation space, namely a classroom for the UFS, in *Second Life*<sup>TM</sup> (see Chapter 5) was cross-sectional and thus only explored the learning experience at one given point in time. A longitudinal approach that measures the learning experience over time may enrich the insights gained from this study.
- The Action Learning Action Research-guided part of the study (see Chapter 5) dealing with the learning experience engaged with 25 students only. A larger cohort of students would have brought a more generalisable perspective to universities in South Africa and Africa comparable to the University of the Free State on the learning experience in this domain.

- With the exploration of the landscape of key features of learning facilitation in *Second Life*<sup>™</sup>, only information available in English was included. Information available in other languages could not be accessed readily.
- Although the African perspective was built into this study, the setting of this study in one African university only may limit generalisation.

The limitations indicated above do not diminish the significance of this project and the role it plays in knowledge-creation. Evidence from the small-scale project brought valuable perspectives gained about learning experiences. This paves the way towards embarking on learning facilitation and a total new way of higher education delivery. From the culmination of insights from this study, the following recommendations are made below.

## 6.8 Recommendations

This study developed recommendations for higher education facilities in a developing continent on the complete process to be able to facilitate in *Second Life*<sup>™</sup>, but also specifically for the University of the Free State. Recommendations are also made on universal principles for learning facilitation in *Second Life*<sup>™</sup>. Future research possibilities identified are also annotated below the recommendations.

### 6.8.1 Higher Education facilities in a developing continent

- Equip African universities in learning environments similar to that of the University of the Free State and students for learning facilitation in *Second Life*<sup>™</sup> by requesting Linden Lab to fund such an initiative from Africa and developing continents with technological infrastructure and knowledge transfer.
- Create a *Second Life*<sup>™</sup> Centre at the University of the Free State in Africa to plan the whole process, procure the land, manage the design, recruit full-time avatar lecturers, appoint an ICT staff member mainly responsible for avatar technical assistance, appoint avatar training staff to assist learning facilitation in *Second Life*<sup>™</sup>.

- Launch a collaborative project with representatives of the 26 public universities in South Africa to investigate higher education learning facilitation in *Second Life*<sup>™</sup> from an African perspective.
- Benchmark against middle-sized, public, North American universities facilitating learning in *Second Life*<sup>™</sup>. Do on site-visits at these universities and interview the responsible staff members to hear what their main challenges were and how they solved them.
- Form partnerships with universities of similar key features, indicated in this study, for guidance on learning facilitation in *Second Life*<sup>™</sup> and invite their acquainted lecturers to African universities starting-up to facilitate in *Second Life*<sup>™</sup>.
- Secure funding for the acquisition of land, the creation of buildings and learning facilitation spaces, branding, and the purchasing of artefacts from public and private entities.
- Propose a new academic career path to top management, namely the appointment of full-time avatar learning facilitators. Because they will be employed as full-time avatar learning facilitators in their field of expertise, they will not need to do this in their spare time - which is often the case. The human resource processes of higher education institutions might be challenged by the proposed academic category of *avatar learning facilitators*, because of the prime responsibility to facilitate in *Second Life*<sup>™</sup>. Therefore, preparations for proactive change management are important.
- Bring it under the attention of ICT services of universities to allow students and learning facilitators access without firewall blocking interference
- Advise universities to authorise *Second Life*<sup>™</sup> as a zero-rated platform, which means that students can access internet sites free of charge if they log onto the Global Protect system, or similar systems, of the university. In practice, it means that they enter these websites by means of the connectivity brought to their computers by the servers of the universities. Zero-rating of educational platforms is critical in Africa to ensure that no student is left behind because of financial constraints or a lack of internet connectivity.

- The leader of the *Second Life*<sup>™</sup> facilitation initiative per higher education institution needs to spend many hours in this domain to become accustomed to the environment.

### 6.8.2 University of the Free State, the research site university

- Based on the findings of the study, it is worth considering a viability study of *Second Life*<sup>™</sup> learning facilitation at the University of the Free State in Africa.
- Introduce and demonstrate learning facilitation in *Second Life*<sup>™</sup> to the following; namely, representatives of top and senior management, university representative bodies, academics, information technology services and student representative groups.
- Consult extensively with all these bodies before any plans are made or actions are taken, because of the huge resource, time, and management implications of learning facilitation in *Second Life*<sup>™</sup> at any higher education institution.
- Make institutional plans after the Orientation and Euphoria phases of creating a *Second Life*<sup>™</sup> institutional presence were experienced. Plan especially from within, and for the Crisis phase (according to the adapted Virtual World Adjustment Theory), because it will be at this stage that universities might terminate their presence. Therefore, take the process into the Crisis phase according to the theory and start planning from there to implement learning facilitation during the Survival phase. This will lead to Transformative Learning.
- Plan, but see planning from the start as a process of continuous adaption - because learning facilitation in *Second Life*<sup>™</sup> is fluid.
- Investigate and explore the South African Qualifications Authority (SAQA) process to be followed to accredit degrees facilitated in *Second Life*<sup>™</sup>.
- A review is also necessary to ensure that the degrees offered by means of real-life learning facilitation, and *Second Life*<sup>™</sup> learning facilitation carry the same internal and external values and are equally valid.
- Learning facilitation in *Second Life*<sup>™</sup> can also be added as part of the blended learning options that residence universities provide. Therefore, this option can be

rolled out as an expansion to the facilitation options available already at the University of the Free State.

- Guides and manuals need to be developed specifically for UFS students and learning facilitators.
- Real-time and 24-hour avatar *Second Life*<sup>TM</sup> assistance is proposed for *Second Life*<sup>TM</sup> learning facilitation to assist learning facilitators and students during the learning facilitation process.

### 6.8.3 Learning facilitation within *Second Life*<sup>TM</sup>

- Develop guidelines for learning facilitators on how to facilitate in *Second Life*<sup>TM</sup> for deep learning to occur within students. This will work towards the aims of universities to graduate students within residence time.
- Students favoured the exploration possibilities and the time-saving element during learning facilitation in *Second Life*<sup>TM</sup>. Therefore, universities from a developing continent should focus on the exploration element during learning facilitation in *Second Life*<sup>TM</sup>, coupled with variety of learning facilitation methods. Following up with a debate and discussion is paramount to learning.
- When learning facilitation in *Second Life*<sup>TM</sup> is planned, evaluate and re-evaluate the facilitation activities to ensure that it is not perceived in the same way, as students express with regards to traditional classrooms, as being mundane.
- Reiterate it with avatar learning facilitators to view learning facilitation differently, because effective higher education facilitation in *Second Life*<sup>TM</sup> does not replicate a real-life traditional face-to-face classroom.
- Oppose the global trend of classroom facilitation as the leading learning facilitation method and focus on debate and innovative practise. Traditional classroom lecturing can be used to commence with learning facilitation in *Second Life*<sup>TM</sup>, but then facilitation methods need to evolve keeping the Crisis phases of the students in mind.
- Sound pedagogical methods always need to be considered with learning facilitation in *Second Life*<sup>TM</sup>. The liked components of fun and engagement does not imply a lesser extent of pedagogical foundation.

- Balance needs to be sought with learning facilitation in *Second Life*<sup>TM</sup> between the unlimited, flexible options offered inworld and what is practical and doable within the context of a developing continent.
- Action Learning should be built into future studies, such as these, because learning from and with others brought real insight from the African participants and their context. This enhanced the learning experience. Since Action Learning worked very well to understand perspectives in this study, its design, approach, and methodology are ideal for future work in this domain.

#### 6.8.4 Future research

Topics that are proposed for future research regarding learning facilitation in *Second Life*<sup>TM</sup>, based on this study, are:

- *Second Life*<sup>TM</sup>-specific learning theories, and not virtual world learning theories as general category, need to be developed and expanded.
- Research comparing the performance of students receiving learning facilitation in face-to-face facilitation with those in *Second Life*<sup>TM</sup>.
- Research evaluating which facilitation methods deliver the best performance results for students that are learning in *Second Life*<sup>TM</sup>.
- Research exploring the different learning facilitation methods in *Second Life*<sup>TM</sup> and those shown to engage students and bring authentic and deep learning.

### 6.9 Contribution of the study

This study contributed to the body of knowledge within higher education by means of the end results:

1. Producing the adapted Virtual World Adjustment Theory,
2. The literature review exploration and content analysis investigation into the key features of higher education learning facilitation in *Second Life*<sup>TM</sup>,
3. Findings on the learning experience of learning facilitation in *Second Life*<sup>TM</sup>,

4. The markers developed to contribute to the reshaping of higher education learning facilitation in the *Second Life*<sup>TM</sup> domain

These end results are associated with the four main research objectives of the study. The objectives were achieved.

This study stems from the African higher education context and fills the gap in research on the voice of Africa in terms of *Second Life*<sup>TM</sup> learning facilitation. With this study, frameworks, guidelines, and markers were created for the University of the Free State, Africa and developing continents to also become part of learning facilitation implementation in *Second Life*<sup>TM</sup> globally. Then the visible void in the world can be filled and the unequal representation of universities in this domain, between developed and developing continents can be gradually addressed.

The study also brings an African perspective to the global landscape of higher education learning facilitation in *Second Life*<sup>TM</sup>. This study is a further step towards the development of theory on learning facilitation in world.

## 6.10 Conclusion

This chapter concludes the research study. It integrates the introduction, the adapted Virtual World Adjustment Theory, the literature review, exploration, content analysis, and investigation of higher education learning facilitation in *Second Life*<sup>TM</sup>, as well as the experiences of learning facilitation in *Second Life*<sup>TM</sup> at the University of the Free State. Based on this integrated knowledge, markers were developed to contribute to the reshaping of higher education learning facilitation through *Second Life*<sup>TM</sup>. This process responded to and achieved the main aim of this study, furthermore, opened many options for future studies in this regard.

Socrates said that education is the kindling of a flame and not the filling of a vessel. This study, responding directly to learning facilitation in *Second Life*<sup>TM</sup>, supports this wisdom in its essence of learning. *Second Life*<sup>TM</sup> learning cannot and is not the filling of a vessel.

This type of learning entices students and kindles the flame of their engagement since it is not a prescriptive, structured venture with a filled and completed end. Learning is because of exploration, Action Learning, and debate. Marc Cuban said that learning how to learn is the most valuable skill to acquire in an online world (Herrick, 2022). And for that reason, this study and future studies are so important, because learning facilitation must be analysed and synthesised.

Nietzsche contemplated that if you want to fly, you must first learn how to stand, walk, run, climb and dance (Flaneur, 2022). This applies to avatars and their learning in *Second Life*<sup>™</sup>. They cannot fly into flying. The same applies to this study, which may be the stand or the walk leading to the flying into learning facilitation in *Second Life*<sup>™</sup> for this continent. And just as Confucius indicated the three methods to wisdom as reflection, imitation, and experience (Oppong, 2021), this study reflected (on), experienced and imitated learning to gain wisdom in learning facilitation and the learning experience in *Second Life*<sup>™</sup>. The whole purpose of this study, just as with education as is the view of Sydney Harris (Freebairn, 2019 ), was to turn the mirrors of advantages, limitations, and opportunities into windows of future exploration. Let this study teleport you there!

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## APPENDIX A: ETHICAL CLEARANCE



Faculty of Education

31-Mar-2016

Dear Mrs Jacoba Liebenberg

Ethics Clearance: Facilitating learning in a Second Life classroom: the case of the University of the Free State

Principal Investigator: Mrs Jacoba Liebenberg

Department: School of Higher Education Studies (Bloemfontein Campus)

### APPLICATION APPROVED

With reference to your application for ethical clearance with the Faculty of Education, I am pleased to inform you on behalf of the Ethics Board of the faculty that you have been granted ethical clearance for your research.

Your ethical clearance number, to be used in all correspondence is: **UFS-HSD2015/0429**

This ethical clearance number is valid for research conducted for one year from issuance. Should you require more time to complete this research, please apply for an extension.

We request that any changes that may take place during the course of your research project be submitted to the ethics office to ensure we are kept up to date with your progress and any ethical implications that may arise.

Thank you for submitting this proposal for ethical clearance and we wish you every success with your research.

Yours faithfully

Dr. Juliet Ramohai  
Chairperson: Ethics Committee

## **APPENDIX B: INFORMATION LETTER TO FACILITATOR AND CONSENT FORM**

Dear facilitator,

A postgraduate student, Ms JD Liebenberg, in Higher Education Studies at the University of the Free State hereby request you to participate in her PhD study on the facilitation of learning in a *Second Life* classroom at the University of the Free State. The purpose of this study is to investigate whether alternative learning facilitation through *Second Life* has the potential to play a significant role in teaching and learning in the African higher education context.

Please see the attached letter of information on the study and its reciprocal expectations in the accompanying packet to consider participation or non-participation in this study.

Kind regards

Danila Liebenberg

Dear facilitator,

**Research on the facilitation of learning in a *Second Life* classroom, with specific reference to the University of the Free State**

You are hereby invited to participate in a study, which is done to obtain a PhD in Higher Education Studies at the University of the Free State. The study focuses on the facilitation of learning in a *Second Life* classroom, with specific reference to the University of the Free State. The study will be done according to the recommended principles of the ethics guidelines and policies of the University of the Free State and it has been approved by the Ethical Clearance Committee of the University of the Free State.

Before you agree to participate in this study, you are advised to thoroughly read the following explanation on the study. It describes the purpose, requests and duration of the study as well as your rights.

The purpose of this study is to investigate whether alternative learning facilitation through *Second Life* has the potential to play a significant role in teaching and learning in the African higher education context.

You are requested to facilitate two classes, as part of your module on English Academic Literacy, in two different media. The one class will be presented in your traditional classroom, as usual. The other class will take place in a virtual world, called *Second Life*. A training and orientation session in the *Second Life* classroom will be presented before the commencement of these two classes. After these two classes have taken place, an interview will follow on your experience of the two classes in the two different media (traditional and *Second Life* classrooms). You will also be asked to write an ethnographic narrative (an essay on your opinion) about your experience of facilitating these classes in this study.

The duration of both the traditional, as well as the *Second Life* class, will be similar to your usual classes at the UFS. That means that your traditional classroom will last for between 45 minutes and an hour. The same applies to the *Second Life* classroom. The training and orientation session in the *Second Life* classroom may be between 1 and 2 hours, depending on the ease of your experience in the virtual world context. The duration of the interview will be about an hour. Only your opinion is requested and no right or wrong answers exist. It needs to be noted that your opinion is of high importance and value, because it will directly influence the results of the study and recommendations made to the University of the Free State. Time to write an individual essay of opinion (ethnographic narrative) on your experience of these two classrooms, depend on your individual contribution.

It is clearly stated that you have certain rights as voluntary participant in this study and you may exercise any of them at any time. Firstly, your participation is voluntarily. If you refuse to participate, it will involve no penalty and will not impair your position as English Academic Literacy module facilitator. Secondly, you may refuse to answer any question posed to you in the interview that you do not feel comfortable with. Thirdly, you may withdraw from this study at any time and discontinue participation at any time. Again, this will not lead to any penalty or prejudice against you. Fourthly, your responses will be handled with the utmost confidentiality and several steps will be taken to protect your anonymity and identity. Fifthly, your opinions will be reported on unbiased and in an anonymous format. Sixthly, it is anticipated that participation in this study will not expose you to any risks or discomforts. Seventhly, the interview will be audio recorded for the sole purpose to revisit it after the session in order to report anonymously on the information gathered. The audio recordings will only be kept for one year after the completion of the PhD and will be destroyed thereafter. The transcripts of the recordings will not contain identifying information from the interview and will not include your personal details. Printed transcripts will be kept in a locked cabinet at the University of the Free State and only the researcher will have access to it. It will be destroyed one year after completion of the PhD. Electronic transcripts will be secured with password protection. They will also be destroyed one year after completion of the PhD. Lastly, you are entitled

to request a copy of the final results of this study (contact details of the researcher are given below). The results from this study will be mainly presented in the PhD thesis of the researcher. It may also feature in manuscripts submitted for publication to academic journals or in papers at national and international conferences. As stated earlier, your name will not be used in these documents and no identifying information will be revealed.

As mere gratitude, and by no way compensation for your time granted, you will receive a R500 supermarket voucher for your participation when you submit your ethnographical narrative at the end of the study.

You will thus be asked to complete an informed consent form if you agree to participate in the study. Participation in this study. If you have further questions, you are welcome to contact Danila Liebenberg at [liebenbergjd@ufs.ac.za](mailto:liebenbergjd@ufs.ac.za) or at 084 982 0001.

Your positive consideration to participate will be highly appreciated.

Danila Liebenberg

## **Consent form**

### **Purpose of the form**

This form is an informed consent form. It asks your permission to participate in a PhD study on the facilitation of learning in a *Second Life* classroom at the University of the Free State. The consent form also requests your participation in an interview with regard to your facilitation experience in *Second Life*.

### **Purpose of the study**

The purpose of this study is to investigate whether alternative learning facilitation through *Second Life* has the potential to play a significant role in teaching and learning in the African higher education context.

### **What is requested of you?**

You are requested to facilitate two classes, as part of your module on English Academic Literacy, in two different media. The one class will be presented in your traditional classroom, as usual. The other class will take place in a virtual world, called *Second Life*. A training and orientation session in the *Second Life* classroom will be presented before the commencement of these two classes. After these two classes have taken place, an interview will follow on your experience of the two classes in the two different media (traditional and *Second Life* classrooms). You will also be asked to write an ethnographic narrative (an essay on your opinion) about your experience of facilitating these classes in this study.

### **How much of your time will this study involve?**

- The duration of both the traditional, as well as the *Second Life* class, will be similar to your usual classes at the UFS. That means that your traditional classroom will last for between 45 minutes and an hour. The same applies to the *Second Life* classroom.

- The training and orientation session in the *Second Life* classroom may be between 1 and 2 hours, depending on the ease of your experience in the virtual world context.
- The duration of the interview will be about an hour. Only your opinion is requested and no right or wrong answers exist. It needs to be noted that your opinion is of high importance and value, because it will directly influence the results of the study and recommendations made to the University of the Free State.
- Time to write an individual essay of opinion (ethnographic narrative) on your experience of these two classrooms, depend on your individual contribution.

### **What else do you need to know?**

The interview will be audio recorded for the sole purpose to revisit it after the session in order to report anonymously on the information gathered.

### **Which rights do you have?**

- Your participation is voluntarily.
- You may refuse to answer any question that you do not feel comfortable with
- You may withdraw from this study at any time
- Your responses will be handled with the utmost confidentiality
- Your opinions will be reported on unbiased and in an anonymous format

### **Will you receive any form of gratitude?**

You will receive a R500 supermarket voucher as gratitude for your participation when you submit your ethnographical narrative at the end of the study.

### **What do you need to do next?**

Please complete the informed consent part below.

I, \_\_\_\_\_ (name; please print clearly), have read the information letter. I voluntarily agree to participate in this study. I understand that I may refuse to answer any question that I do not feel comfortable with, to answer. I am

aware that I may withdraw from this study at any time. I understand that my responses will be handled with confidentiality and will be used on the basis of an anonymous format.

	<b>Please sign in this column if you agree</b>
I confirm that I have read and that I understand the information sheet for the above study and have had the opportunity to ask questions.	
I understand that my participation is voluntary and that I am free to withdraw at any time, without giving reason.	
I agree to take part in the above study.	
I agree to the interview being audio recorded	
I agree to the use of anonymised quotes in publications	
I agree that my data gathered in this study may be securely stored (after it has been anonymised) and may be used for future research.	

\_\_\_\_\_

Participant Signature

\_\_\_\_\_

Date

\_\_\_\_\_

Name of Researcher

\_\_\_\_\_

Date

\_\_\_\_\_

Signature

## **APPENDIX C: INFORMATION LETTER TO STUDENTS AND CONSENT FORM**

Dear student,

A postgraduate student, Ms JD Liebenberg, in Higher Education Studies at the University of the Free State hereby request you to participate in her PhD study on the facilitation of learning in a *Second Life* classroom at the University of the Free State. The purpose of this study is to investigate whether alternative learning facilitation through *Second Life* has the potential to play a significant role in teaching and learning in the African higher education context.

Please see the attached letter of information on the study and its reciprocal expectations in the packet distributed to you in class to consider participation or non-participation in this study.

Kind regards

Danila Liebenberg

## Information letter to students and consent form

### Purpose of the form

This form is an informed consent form. It asks your permission to participate in a PhD study on the facilitation of learning in a *Second Life* classroom at the University of the Free State. The consent form also requests your participation in a focus group discussion.

### Purpose of the study

The purpose of this study is to investigate whether alternative learning facilitation through *Second Life* has the potential to play a significant role in teaching and learning in the African higher education context.

### What is requested of you?

You are requested to attend three classes, as part of your module on English Academic Literacy, in two different media. The one class will be presented in your traditional classroom, as usual. The other two classes will take place in a virtual world, called *Second Life*. A training and orientation session in the *Second Life* classroom will be presented before the commencement of these two classes. After these two classes have taken place, a focus group discussion will follow on your experience of the two classes in the two different media (traditional and *Second Life* classrooms). You will also be asked to write an ethnographic narrative (an essay on your opinion) about your individual experience of these classrooms and this study.

### How much of your time will this study involve?

- The duration of both the traditional, as well as the *Second Life* classes, will be similar to your usual classes at the UFS. That means that your traditional classroom will last for between 45 minutes and an hour. The same applies to the *Second Life* classroom.

- The training and orientation session in the *Second Life* classroom may be between 1 and 2 hours, depending on the ease of your experience in the virtual world context.
- The duration of the focus group will be about 2 hours. Only your opinion is requested and no right or wrong answers exist. It needs to be noted that your opinion is of high importance and value, because it will directly influence the results of the study and recommendations made to the University of the Free State.
- Time to write an individual essay of opinion (ethnographic narrative) on your experience of these two classrooms, depend on your individual contribution.

### **What else do you need to know?**

The focus group discussion will be audio recorded for the sole purpose to revisit it after the session in order to report anonymously on the information gathered.

### **Which rights do you have?**

- Your participation is voluntarily.
- You may refuse to answer any question that you do not feel comfortable with
- You may withdraw from this study at any time
- Your responses will be handled with the utmost confidentiality
- Your opinions will be reported on unbiased and in an anonymous format

### **Will you receive any form of gratitude?**

You will receive a R200 Van Schaik, or Protea, book shop voucher as gratitude for your participation when you submit your ethnographical narrative at the end of the study.

### **What do you need to do next?**

Please complete the informed consent part below.

I, \_\_\_\_\_ (name; please print clearly), have read the information letter. I voluntarily agree to participate in this study. I understand that I may refuse to answer any question that I do not feel comfortable with, to answer. I am


aware that I may withdraw from this study at any time. I understand that my responses will be handled with confidentiality and will be used on the basis of an anonymous format.

	<b>Please sign in this column if you agree</b>
I confirm that I have read and that I understand the information sheet for the above study and have had the opportunity to ask questions.	
I understand that my participation is voluntary and that I am free to withdraw at any time, without giving reason.	
I agree to take part in the above study.	
I agree to the focus group being audio recorded	
I agree to the use of anonymised quotes in publications	
I agree that my data gathered in this study may be securely stored (after it has been anonymised) and may be used for future research.	

\_\_\_\_\_  
Participant Signature

\_\_\_\_\_  
Date

# APPENDIX D: STEP BY STEP GUIDE TO GRIEFING IN *SECOND LIFE*<sup>TM</sup>



## Step by step guide to griefing in *Second Life*<sup>TM</sup>

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<p><input type="checkbox"/> 1. Stay calm Griefers get bored if you ignore them.</p>	<p><input type="checkbox"/> 7. Land security The access availability to the UFS domain is just accessible to registered students.</p>
<p><input type="checkbox"/> 2. Basic knowledge You cannot die in <i>Second Life</i><sup>TM</sup> and they do not have special power.</p>	<p><input type="checkbox"/> 8. Report Report any griefing immediately to researcher and facilitator.</p>
<p><input type="checkbox"/> 3. Mute the griefer Mute the griefer by profile or history.</p>	<p><input type="checkbox"/> 9. Escalated report The researcher will immediately report griefing to Linden Lab.</p>
<p><input type="checkbox"/> 4. Avoid being pushed around Just sit down.</p>	<p><input type="checkbox"/> 10. Debriefing Debriefing available with Careways by request.</p>
<p><input type="checkbox"/> 5. Find invisible objects Ctrl-Alt-T makes the invisible, visible.</p>	
<p><input type="checkbox"/> 6. Hide particles View-beacons and get rid of spam.</p>	

## APPENDIX E: DATA GATHERED ON FACILITATION FOCI AND FACILITATION METHODS USED IN *SECOND LIFE*™ GLOBALLY

University	Facilitation Focus		Facilitation Methods	
	Focus	Frequency	Methods	Frequency
1	Student services	12	Meetings	13
2	Computer Programming	4	Events	14
3	Aerospace	3	Art gallery visits	4
4	Aviation	2	Contests	1
5	Sciences	9	Performing art shows	1
6	Business	5	Communities	7
7	Engineering	5	Interpersonal interaction	13
8	Cyber security & intelligence	1	Simulation	31
9	Architecture	4	Design	12
10	Military education	1	Creation	22
11	Informatics	1	Flight simulation	1
12	Leadership	3	Observation	8
13	Higher Education	24	Role play	10
14	Research	23	Visits	15
15	Resources provision	2	Interaction with artefacts	5
16	Biosecurity	1	Briefing rooms	1
17	Disease prevention with poultry	1	Videos	10
18	Pest management	1	Scenarios	12
19	Facilitator training	2	Collaboration	30
20	Genetics	2	Classroom facilitation	44
21	Business Management	2	Tutorials	9
22	Education	21	Sandboxes	13
23	War strategy	1	Discussion groups	19
24	War fighters	1	Interactive exhibitions	7
25	Teaching and Learning	6	Consult resources	2
26	Dietetics	3	Questionnaires	2
27	Nursing	6	Robots	1
28	Mathematics	8	Interactive tools	3
29	Gaming	4	Projects	13
30	ICT	2	Informative hyperlinks	1
31	Disaster Management	2	Notecards	4
32	Public Health	2	Scavenger hunts	4
33	Emergency response	2	Book stages	1
34	Marketing	3	Activities	10
35	Bioterrorism	2	Tours	16
36	Writing	2	Audio	2
37	Spanish	1	Animation	1
38	Media studies	3	Networking	7
39	Learning	2	Chromosome Café visits	1
40	Social issues	1	Exhibitions	29
41	World issues	1	Experimentation	13
42	Foreign policy	1	Displays	12

43	Human rights	1	Dialogue	5
44	Genealogy	1	Debate	2
45	Literacy	1	Smart Screens	4
46	Secondary School Education	1	Conferences	13
47	Social Science	2	Presentations	11
48	Ethics	1	Reflection	5
49	Information services	2	Exploration	17
50	Geophysics	1	Interactive multimedia displays	4
51	Educational technology	4	Mock exercises	2
52	Avatar psychology	1	Predictions	1
53	Aqua farming	1	Guest lectures	5
54	Aqua culture	1	Information sessions	2
55	Music	3	Field trips	5
56	Auto and boat repairs	1	Mountain retreat	1
57	Astronomy	4	Educational play	1
58	MBA	3	Digital media	1
59	Mathematical art	1	Photo campaigns	1
60	Management	4	Lecture-dance parties	1
61	Motivation	1	Workshops	5
62	Design	4	Museum visits	7
63	Border service	1	Engagement	1
64	Drug awareness	1	Reference desks	3
65	Digital media design	2	Groups	4
66	Media arts	1	Interactive surveys	1
67	Biosensors	1	Library visits	20
68	Fine arts	1	Subject guides	1
69	Graphic design	1	Location guides	1
70	Political science	1	Group activities	1
71	Psychology	5	Individual activities	1
72	Medicine	10	Music	2
73	Business administration	1	Art	2
74	Entrepreneurship	2	Campus support	1
75	E-commerce	1	Virtual books	1
76	History	5	Interdisciplinary coalitions	1
77	Astrobiology	1	Telescope viewings	1
78	Space	2	Research	7
79	Virtual worlds	3	Marketing	1
80	Disabilities	2	Amphitheatre	2
81	Biology	2	Solar eclipse exhibits	1
82	Finance	1	PI day	1
83	English	5	Chats	3
84	Animation	1	Mentor Park	1
85	Language	5	3D encyclopaedia	1
86	Computer Science	2	Photography	1
87	Art history	2	Discussions	15
88	Interactive resources	1	Sculptures	1
89	Field research methods	1	Hyper collaboration	1
90	Chemistry	4	Bulletin boards	1
91	Ethnography	1	Creative thinking classes	1
92	Interactive Media Studies	1	Programming	1
93	Information studies	1	Construction	2
94	Behavioural studies	2	Public speaking	1
95	Human complex systems	1	Laboratories	8
96	Information literacy	2	Event planning	1
97	Communication Science	4	Posters	2
98	Literature	1	Identity mapping	1
99	English literature	1	Scripting	2

100	Exposure therapy	1	Poems	1
101	Anxiety	1	Short stories	1
102	Arts	8	Movies	1
103	Accounting	1	Songs	1
104	Fashion	1	Timelines	1
105	Instructional technology	4	Space exploration	1
106	Student counselling	1	Space shuttle launches	1
107	Social work	1	Rocket rides	1
108	Culture studies	1	Seminars	7
109	Environmental Science	1	Competitions	1
110	Earth studies	3	Critiqued solutions	1
111	Aesthetic computing	1	Curators opinions	1
112	Biomedicine	1	Virtual hallucinations	1
113	Biomedical engineering	1	Meditation meetings	1
114	Physics	2	Compose	1
115	Nuclear physics	1	Writing	2
116	Nuclear energy	1	Social spaces	2
117	Second Life education	2	Bio-sensed emotional signals	1
118	Anthropology	1	Dancing	1
119	Journalism	1	Landmarks	1
120	Hospitality	1	Forums	1
121	Philosophy	2	Content development	1
122	International business	1	Fashion parades	1
123	Teaching practice	1	Demonstration	4
124	Emerging technologies	1	Literature houses and stadiums	1
125	Agriculture	2	Digital visualisation of numbers	1
126	Drama	3	Learning kiosks	1
127	Underwater marine life	2	Podcasts	2
128	Politics	1	Campfires	1
129	Computing	1	3D Equations	1
130	Sacred art	1	Gaming	1
131	Religion studies	2	Telescopic observations	1
132	Poetry	1	Interactive media	1
133	Bots	2	Social investigation	1
134	Artificial Intelligence	1	Collaborative design	1
135	Educational development	1	Narratives	3
136	Instructional systems design	1	Productions	2
137	Dynamic Learning events design	1	Sharing of ideas	1
138	Digital games education	1	Voice language practice	1
139	Robotics	1	Group projects	1
140	Economics	2	Blogs	2
141	Virtual reality technology	1	Slideshows	1
142	Interdisciplinary research	1	Bridging	1
143	Social Media	1	Voting centres	1
144	Information systems	1	Time-travel	1
145	Zoology	1	World War I poetry digital archive visits	1
146	Insects	1	Readings	2
147	Multimedia course design	1	Modelling	1
148	Health Sciences	1	Streaming	1
	Sociolinguistics	1	Interviews	1
	Applied sciences	1	Films	1
	Tourism	1	Training camps	1
	Oceanography	3	Trenches	1
	Negotiation skills	1	Enrolment stations	1

	Sound	1	Slideshow viewers	1
	International relations	1	Individual projects	1
	Midwifery	1	Maths sculptures	1
	Customer care	1	Skyboxes	2
	Art	4	Interactive multimedia	1
	Gamification	1	Experiential learning	1
	Legal advocacy	1	Video conferencing	1
	Law	1	Interactive smart screens	2
	Film	1	Ethnographical reflections	1
	TV	1	Investigation	1
	Radio	1	Problem-solving	1
	Creative writing	1	Ethnography	1
	Wound clinic	1	Learning	1
	Language acquisition	1	Text analysis	1
	Governance	1	3 D animation	1
	Pedagogies	1	International collaboration	2
	Sociology	1	Film studio creations	1
	Chinese studies	2	Conversations	1
	Intellectual property law	1	Voice peer interaction	1
	Pharmaceutical science	1	Interactive nodes	1
	Ocean technology	1	Cross cultural collaboration	1
	Deep sea	1	Heritage zones	1
	Life	1	Practice sessions	1
	Cross disciplinary	1	Voice chats	1
	Geology	1	Small group interaction	1
	Nature	1	Group work	1
	Geomorphology	1	Theatre productions	1
	Applied Social Sciences	1	Specialist speakers	2
	Hotel and Tourism	1	Newbie gardens	1
	Mechanics	1	Education squares	1
	Intercultural competence	1	Design spaces	1
	Autism	1	Wikis	1
			Mock up trials	1
			Visualisation techniques	1
			Film creation	2
			Collaborative learning	2
			Self-directed learning	1
			Web-quests	1
			Interactive objects	1
			PowerPoints	1
			Context-based learning	1
			Chinese chat club	1
			Religious space visits	1
			Volcano walks	1
			Space elevator	1
			Communication	1
			Resources consultation	1
			Film production	1
			Critical incidents	1
			Narration	1

## APPENDIX F: DATA OF FACILITATION FOCI AND FACILITATION METHODS USED IN *SECOND LIFE* PER CONTINENT

### North America

University	Facilitation Focus		Facilitation Methods	
	Focus	Frequency	Methods	Frequency
1	Student services	9	Meetings	11
2	Computer Programming	4	Events	9
3	Aerospace	3	Art Gallery visits	2
4	Aviation	2	Contests	1
5	Sciences	9	Performing art shows	1
6	Business	2	Communities	4
7	Engineering	3	Interpersonal interaction	7
8	Cyber security & intelligence	1	Simulation	18
9	Architecture	2	Design	7
10	Military education	1	Creation	14
11	Informatics	1	Flight simulation	1
12	Leadership	3	Observation	5
13	Higher Education	20	Role play	4
14	Research	18	Visits	9
15	Resources provision	2	Interaction with artefacts	4
16	Biosecurity	1	Briefing rooms	1
17	Disease prevention with poultry	1	Videos	7
18	Pest management	1	Scenarios	7
19	Facilitator training	2	Collaboration	18
20	Genetics	1	Classroom facilitation	27
21	Business Management	2	Tutorials	3
22	Education	11	Sandboxes	10
23	War strategy	1	Discussion groups	12
24	War fighters	1	Interactive exhibitions	5
25	Teaching and Learning	4	Consult resources	2
26	Dietetics	3	Questionnaires	1
27	Nursing	6	Robots	1
28	Mathematics	7	Interactive tools	2
29	Gaming	3	Projects	8
30	ICT	2	Informative hyperlinks	1
31	Disaster Management	1	Notecards	4
32	Public Health	2	Scavenger hunts	3
33	Mathematical Art	1	Book stages	1
34	Marketing	1	Activities	5
35	Bioterrorism	2	Tours	11
36	Writing	2	Audio	1
37	Spanish	1	Animation	1
38	Media Studies	2	Networking	6
39	Learning	2	Chromosome Café visits	1
40	Social issues	1	Exhibitions	16

41	World issues	1	Experimentation	7
42	Foreign policy	1	Displays	9
43	Human Rights	1	Dialogue	3
44	Genealogy	1	Debate	1
45	Literacy	1	Smart screens	2
46	Secondary School Education	1	Conferences	7
47	Social Sciences	1	Presentations	8
48	Ethics	1	Reflection	3
49	Information services	2	Exploration	9
50	Geophysics	1	Interactive multimedia displays	4
51	Educational technology	3	Mock exercises	2
52	Avatar psychology	1	Predictions	1
53	Aqua farming	1	Guest lectures	5
54	Music	3	Information sessions	2
55	Aqua culture	1	Field trips	3
56	Auto and boat repairs	1	Mountain retreat	1
57	Emergency response	2	Educational play	1
58	Astronomy	4	Digital media	1
59	MBA	3	Photo campaigns	1
60	Management	2	Lecture-dance parties	1
61	Motivation	1	Workshops	4
62	Design	2	Museum visits	6
63	Border service	1	Engagement	1
64	Drug Awareness	1	Reference desks	2
65	Digital Media Design	2	Groups	3
66	Media Arts	1	Interactive surveys	1
67	Biosensors	1	Library visits	13
68	Graphic design	1	Subject guides	1
69	Political science	1	Location guides	1
70	Fine arts	1	Group activities	1
71	Psychology	3	Individual activities	1
72	Medicine	7	Music	2
73	Business administration	1	Art	2
74	Entrepreneurship	1	Campus support	1
75	E-commerce	1	Virtual books	1
76	History	3	Interdisciplinary coalitions	1
77	Astrobiology	1	Telescope viewings	1
78	Space	1	Research	4
79	Virtual worlds	2	Marketing	1
80	Disabilities	1	Amphitheatre	2
81	Finance	1	Solar eclipse exhibits	1
82	Biology	1	PI day	1
83	English	4	Chats	3
84	Animation	1	Mentor Park	1
85	Language	2	3D encyclopaedia	1
86	Computer science	1	Photography	1
87	Art history	2	Discussions	8
88	Interactive resources	1	Sculptures	1
89	Field research methods	1	Hyper collaboration	1
90	Chemistry	2	Bulletin boards	1
91	Ethnography	1	Creative thinking classes	1
92	Interactive Media Studies	1	Programming	1
93	Information studies	1	Construction	2
94	Behavioural studies	1	Public speaking	1
95	Human complex systems	1	Laboratories	3
	Information literacy	1	Event planning	1
	Communication Science	3	Posters	2
	Literature	2	Identity mapping	1

	Exposure therapy	1	Scripting	2
	Anxiety	1	Poems	1
	Arts	5	Short stories	1
	Accounting	1	Movies	1
	Fashion	1	Songs	1
	Instructional technology	4	Timelines	1
	Student counselling	1	Space exploration	1
	Social work	1	Space shuttle launches	1
	Culture studies	1	Rocket rides	1
	Environmental Science	1	Seminars	3
	Earth studies	1	Competitions	1
	Aesthetic computing	1	Critiqued solutions	1
	Biomedicine	1	Curators opinions	1
	Biomedical engineering	1	Virtual hallucinations	1
	Physics	1	Meditation meetings	1
	Nuclear physics	1	Compose	1
	Nuclear energy	1	Writing	1
	Second Life education	1	Social spaces	2
	Anthropology	1	Bio-sensed emotional signals	1
	Journalism	1	Dancing	1
	Hospitality	1	Landmarks	1
	Philosophy	2	Forums	1
	International business	1	Content development	1
	Teaching practice	1	Fashion parades	1
	Emerging technologies	1	Demonstration	2
	Agriculture	1	Literature houses and stadiums	1
	Drama	1	Digital visualisation of numbers	1
	Underwater marine life	1	Learning kiosks	1
	Politics	1	Podcasts	1
	Computing	1	Campfires	1
	Sacred art	1	3D Equations	1
	Religion studies	1	Gaming	1
			Telescopic observations	1
			Interactive media	1
			Social investigation	1
			Collaborative design	1
			Narratives	2
			Productions	2
			Sharing of ideas	1
			Voice language practice	1
			Group projects	1
			Blogs	1
			Slideshows	1
			Bridging	1
			Voting centres	1

Europe

University	Facilitation Focus		Facilitation Methods	
	Focus	Frequency	Methods	Frequency
1	Higher Education	2	Classroom facilitation	9
2	History	2	Displays	3
3	Poetry	1	Scenarios	2
4	Chemistry	1	Time-travel	1
5	Biology	1	World War I poetry digital archive visits	1
6	Student services	3	Audio	1
7	Mathematics	1	Tutorials	4
8	Computer Science	1	Readings	2
9	Education	4	Exploration	4
10	Virtual worlds	1	Modelling	1
11	Bots	1	Interactive tools	1
12	Artificial Intelligence	1	Videos	2
13	Information Literacy	1	Streaming	1
14	Disabilities	1	Interviews	1
15	Educational development	1	Films	1
16	Instructional systems design	1	Training camps	1
17	Dynamic Learning events design	1	Trenches	1
18	Space	1	Simulation	7
19	Digital games education	1	Laboratories	3
20	Robotics	1	Enrolment stations	1
21	Economics	1	Exhibitions	3
22	Entrepreneurship	1	Visits	5
23	Marketing	2	Discussion groups	3
24	Management	1	Slideshow viewers	1
25	Physics	1	Individual projects	1
26	Virtual reality technology	1	Seminars	2
27	Interdisciplinary research	1	Maths sculptures	1
28	Psychology	2	Smart screens	1
29	Genetics	1	Skyboxes	1
30	Research	3	Collaboration	6
31	Social Media	1	Creation	4
	Media Studies	1	Design	3
	Arts	2	Interactive multimedia	1
	Business	1	Role-play	3
	Information systems	1	Communities	2
	Zoology	1	Experiential learning	1
	Insects	1	Video conferencing	1
	Language	2	Interactive smart screens	2
	Multimedia course design	1	Discussions	5
	Health Sciences	1	Library visits	5
	Sociolinguistics	1	Ethnographical reflections	1
	Engineering	1	Investigation	1
	Applied sciences	1	Experimentation	4
	Social Sciences	1	Problem-solving	1
	Teaching and learning	1	Museum visits	1
	Tourism	1	Scavenger hunts	1
	Oceanography	1	Conferences	2
	Negotiation skills	1	Presentations	2

	Disaster management	1	Debate	1
	Sound	1	Ethnography	1
	Drama	1	Learning	1
	Gaming	1	Activities	3
	Environmental Science	1	Text analysis	1
	Design	1	Reflection	1
	International relations	1	Events	1
	Midwifery	1	3 D animation	1
			Reference desks	1
			Podcasts	1
			Projects	3
			International collaboration	2
			Film studio creations	1
			Interpersonal interaction	3
			Conversations	1
			Dialogue	1
			Voice peer interaction	1
			Interactive nodes	1
			Cross cultural collaboration	1
			Heritage zones	1
			Narratives	1
			Practice sessions	1
			Voice chats	1
			Small group interaction	1
			Observation	1
			Group work	1
			Theatre productions	1
			Sandboxes	2
			Networking	1
			Research	1
			Tours	1

**Australia**

University	Facilitation Focus		Facilitation Methods	
	Focus	Frequency	Methods	Frequency
1	Education	5	Exhibitions	6
2	Higher Education	2	Presentations	1
3	Customer care	1	Specialist speakers	2
4	Art	4	Communities	1
5	Architecture	2	Creation	2
6	Business	2	Collaboration	4
7	Second Life education	1	Simulation	2
8	Gamification	1	Conferences	3
9	Bots	1	Sandboxes	1
10	Legal advocacy	1	Newbie gardens	1
11	Law	1	Education squares	1
12	Agriculture	1	Skyboxes	1
13	Film	1	Classroom facilitation	5
14	TV	1	Meetings	2
	Radio	1	Events	2
	Creative writing	1	Projects	2
	Wound clinic	1	Design spaces	1
	Languages	1	Reflection	1
	Language acquisition	1	Blogs	1
	Governance	1	Wikis	1
	Educational technology	1	Experimentation	2
	Pedagogies	1	Discussion groups	4
	Sociology	1	Field trips	1
	Chinese studies	2	Workshops	1
	Medicine	2	Mock up trials	1
	Behavioural studies	1	Videos	1
	Intellectual property law	1	Demonstration	1
	Pharmaceutical science	1	Visualisation techniques	1
	Religion studies	1	Role-play	3
	Drama	1	Film creation	2
	Research	1	Exploration	1
		1	Interpersonal interaction	2
	English literature	1	Laboratories	2
			Interactive exhibitions	2
			Collaborative learning	2
			Groups	1
			Writing	1
			Tours	3
			Self-directed learning	1
			Web-quests	1
			Interactive objects	1
			Seminars	1
			Art gallery visits	2
			PowerPoints	1
			Smart screens	1
			Discussions	2
			Dialogue	1
			Research	1
			Context-based learning	1

			Library visits	1
			Activities	1
			Chinese chat club	1
			Creation	1
			Tutorials	1
			Religious space visits	1
			Visits	1

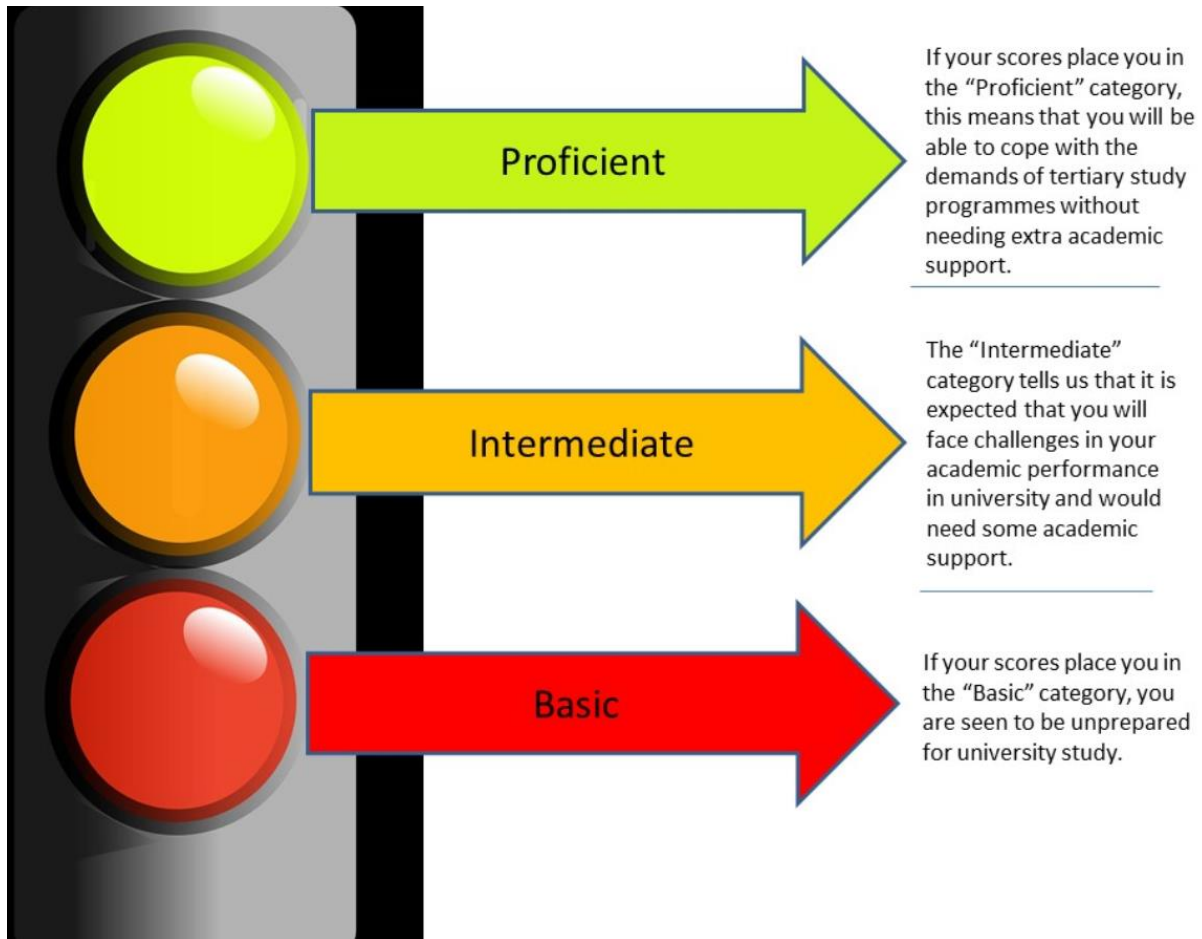
**Asia**

University	Facilitation Focus		Facilitation Methods	
	Focus	Frequency	Methods	Frequency
1	English	1	Exhibitions	3
2	Underwater marine life	1	Classroom facilitation	2
3	Oceanography	2	Scenarios	3
4	Ocean technology	1	Interpersonal interaction	1
5	Deep sea	1	Observation	1
	Earth studies	2	Simulation	3
	Life	1	Tours	1
	Cross disciplinary	1	Exploration	2
	Geology	1	Collaboration	2
	Nature	1	Interaction with artefacts	1
	Geomorphology	1	Volcano walks	1
	Research	1	Space elevator	1
	Medicine	1	Activities	1
	Applied Social Sciences	1	Library visits	1
	Hotel and Tourism	1	Creation	1
	Design	1	Events	1
	Education	1	Design	1
	Communication science	1	Communication	1
	Arts	1	Field trips	1
			Tutorials	1
			Seminars	1
			Conferences	1
			Resources consultation	1
			Film production	1

**South America**

University	Facilitation Focus		Facilitation Methods		Classroom design	
	Focus	Frequency	Methods	Frequency		Frequency
1	Engineering	1	Simulation	1	Traditional	1
2	Mechanics	1	Demonstration	1	Semi-traditional	0
3	Economics	1	Exhibitions	1	Non-traditional	2
	Management	1	Design	1		
	Intercultural competence	1	Observation	1		
	Teaching and Learning	1	Questionnaires	1		
	Autism	1	Critical incidents	1		
			Research	1		
			Events	1		
			Classroom facilitation	1		
			Exploration	1		
			Narration	1		

## APPENDIX G: NBT BENCHMARK LEVELS



## APPENDIX H: NOMINAL GROUP DISCUSSION

The most

1. Ability to explore (3) ✓
2. Computer working (2) ✓
3. Shop online (1) ✓

New form of teaching ✓ (3)

Saves Time ✓ (2)

Participate in class discussion ✓ (1)

22. Quiet to concentrate ✓ (3)

18. Saves time ✓ (2)

12. Ability to explore ✓ (1)

## APPENDIX I: FOCUS GROUP DISCUSSION RESULTS OF WHAT STUDENTS LIKED MOST IN *SECOND LIFE™*

Statement	Score
Exploring different stages of Second Life and other parts of the world	22
Save time	15
I did not have that dreary, mundane feeling of the normal, regular class	10
One is more confident in asking questions and giving answers because nobody really knows who you are.	8
New form of teaching and learning	8
Teleporting to anywhere in Second Life	8
Working on the computer	7
Tests and build your concentration	6
Access to classes easier	5
Spelling assistance	5
Participating in class discussions	4
You can also shop online	4
Quiet surroundings help to concentrate	4
It is fun	3
Enter when you want to from where you want to	3
I can fly	3
I can meet new friends or avatars	3
It enhance our imagination	3
Conversation and chatting helps to learn	2
It gives us the opportunity to interact and learn to communicate in a different way	2
The fact that I look sexy as an immortal figure	2
Everything is possible in Second Life	1
Group discussions. I can ask questions without anyone recognizing me.	1
Answer and ask questions freely	1
Actual class is very quiet, because we communicate through computers	1
The teaching method is very much simple, because we all ask questions on the computer without making any noise and the lecturer answers all the questions we ask	1
It help us to look or think of ourselves visually	1
The ability to sit and hear others around you	1
Easily interact with lecturer	1
You can be anything and anyone without the pressure of trying to fit in some social norm	1
Class short and straight to the point	1
All got a chance to be directly involved in the chat	1
Appearance	1
Have class in convenient environment	1

## APPENDIX J: FOCUS GROUP DISCUSSION RESULTS ON WHAT STUDENTS DISLIKED THE MOST IN *SECOND LIFE*<sup>TM</sup>

Statement	Score
Problematic without computer	12
Struggling to log in and password entry	10
It is not interactive	10
It is expensive	8
It is too fast, especially when you are slow in typing	8
Limited to basic actions, because it makes the experience less exciting	8
Too technical	8
Does not accommodate different social styles	7
No face to face experience with the facilitator	6
No hard copies, everything is online	5
Full of weird other people	5
Not enough chairs in the class	5
Forgetting my password	3
It was like a game	3
You sometimes have to chat by typing	3
Not being able to speak to another avatar	2
Get side-tracked in class	2
How to move my avatar	2
Consumes electric energy	2
Having to struggle before I could understand what the lesson is actually about	1
The stupid chats that have nothing to do with the class	1
The interface could be a lot better. Sometimes you want to reply to the lecturer only, without mixing it up with the texts	1
Not easy to understand, especially for those who understand better with diagrams	1
Not enough time to ask questions	1
Not being in the right place in Second Life	1
Setting up of avatar	1

## APPENDIX K: NARRATIVE REFLECTION OF STUDENTS ON THE LEARNING EXPERIENCE

1. I feel very happy and pleased about having to experience the class in Second life. I really feel excited at the same time.

2. Yes, I think so because I can still communicate with my lecture and I can also get to get more info because there will be no minor distractions then.

3. Blended. Because sometimes learning via second life wont mean I will understand everything so it will be best if sometimes I get to meet with my lecture and discuss face-to-face.

4. I think if this research is successfull we should celebrate it and embrace second life because it is giving us a whole new opportunity to explore teaching and maybe us as teachers can use second life in future for it is a good way to learn in technology.

1. At first it was a bit hard for me, but as the lectures explained thoroughly the simpler it was for me to understand, and I was the able to work on it.

2. Yes, I get to meet new friends with different perspectives and opinions from mine, and in that I get to ~~the~~ learn new information and idea, and I get to stay informed.

3. Blended. Because I would be able to ask the lecture a question that I did not get to ask or what I did not understand in the second life.

4. We should have more of the second life classes as they are fun and we get to learn new things.

# APPENDIX L: COMPILED CHECKLIST FOR CREATION OF LEARNING FACILITATION DOMAINS IN SECOND LIFE

## Checklist for creation of learning facilitation domains in Second Life

- |  |                           |                                  |                          |
|--|---------------------------|----------------------------------|--------------------------|
| 1. Did top management buy-into, and approve, engagement of the institution in learning facilitation in Second Life?                        | <input type="radio"/> Yes | <input type="radio"/> Partially  | <input type="radio"/> No |
| 2. Is the technological infrastructure in place and conducive for learning facilitation in Second Life?                                    | <input type="radio"/> Yes | <input type="radio"/> Partially  | <input type="radio"/> No |
| 3. Was land acquired (rented or bought) to create learning facilitation spaces for the higher education institution in Second Life?        | <input type="radio"/> Yes | <input type="radio"/> In process | <input type="radio"/> No |
| 4. Will the learning facilitation be supported by the division of ICT?   | <input type="radio"/> Yes | <input type="radio"/> Partially  | <input type="radio"/> No |
| 5. Did you budget for the annual maintenance fees for the institution?   | <input type="radio"/> Yes | <input type="radio"/> In process | <input type="radio"/> No |
| 6. Did you consider and plan with regard to the security of students and facilitators inworld, as well as the premises of the institution? | <input type="radio"/> Yes | <input type="radio"/> In process | <input type="radio"/> No |
| 7. Have you planned and consulted with stakeholders on how the learning facilitation spaces of the institution have to be designed?        | <input type="radio"/> Yes | <input type="radio"/> In process | <input type="radio"/> No |

8. Did you follow the guide on course creation with the modules intended to be facilitated in Second Life?  Yes  In process  No
9. Will students be assisted with registration as students of the higher education institution as well as students within Second Life?  Yes  In process  No
10. Are the virtual artefacts in place for learning facilitation sessions?  Yes  Partially  No
11. Have learning facilitators received orientation sessions?  Yes  Organising  No
12. Did students undergo orientation sessions on learning facilitation in Second Life?  Yes  Organising  No
13. Did information sessions take place to align the assumptions of facilitators with Second Life practice?  Yes  In process  No
14. Was the importance of the role of peers and support groups indicated and stressed during orientation sessions for learning facilitators?  Yes  Partially  No