A Critical Assessment at a Local Level of UNISA's Virtual Learning Environment in Terms of the Pedagogical Conversational Framework.

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Research report

Submitted to the Faculty of Humanities, University of the Witwatersrand, Johannesburg, in partial fulfillment of the requirements for the degree of Master of Education.

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DECLARATION

I, Gilbert MUNYEMANA, declare that this research report is my original work. Wherever other resources have been used, they have been acknowledged. It is being submitted in partial fulfilment of the requirements for the degree of Master of Education in the University of the Witwatersrand, Johannesburg. It has not been presented elsewhere for any award.

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ABSTRACT

Education delivered through the Internet known as E-learning is growing tremendously and attracts researchers' attention in terms of its pedagogical merits. It is in that context of investigating the use of Information and Communication Technology (ICT) for efficient learning that the current research was carried out. This study consists of a critical assessment at a Local Level of UNISA's Virtual Learning Environment (VLE[1]) in terms of Diana Laurillard's Pedagogical Conversational Framework. It focuses on assessing how the E-learning platform (called SAKAI) used by UNISA supports the learning process of online students staying in Rwanda. A qualitative approach was followed and documentary analysis along with a questionnaire was used to collect useful data.

Research findings are presented and discussed under two themes: the requirements for effective online learning and the use of the local UNISA's VLE to support effective online learning of students based in Rwanda.
It is revealed that effective online learning is a function of different aspects that can be grouped under three critical factors: Pedagogical, Technological and Managerial. Although, I have argued that the Pedagogical factor should be considered as the most important and guide all E-learning projects, the three factors mentioned are interrelated and interdependent.

Findings about the use of the local UNISA VLE to support the learning process show that it provides sufficient tools to support all activities necessary for learning activities, as summarized in the Conversational Framework. However, the tools provided by the E-learning platform are underused by participants. Some necessary learning activities are not carried out, even though the E-learning platform used provides tools which could support those activities. The under usage of available tools is caused by two factors:

- inadequate consideration given to some necessary learning activities and
- the lack of skills on both usage of and information on the capability of UNISA's VLE.

These handicap the effective online learning. The gaps found in VLE used by UNISA are also mentioned.

The research report ends with recommendations for more effective E-learning in local UNISA VLE. Further studies in related areas are suggested.

[1] A set of tools integrated into web application to facilitate the learning and teaching process completely or partly in online environments.

DEDICATION

To the God Almighty

To my late dad Enos MVUYEKURE

To my dearest mum Léonille MUHAWENIMANA

To my beloved sister:

Germaine UWERA

Gisele T. FURAHA

Josélyne UWITONZE

And to all my friends and relatives

I dedicate this research report.

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LIST OF ABBREVIATIONS AND ACRONYMS

ASCILITE	: Australasian Society for Computers In Learning In Tertiary Education
JISC	: Joint Information System Committee]
UNISA	: University of South Africa
USA	: United States of America
VLE	: Virtual Learning Environment
ICT	: Information and Communication Technology
IT	: Information Technology
LMS	: Learning Management System
CLE	: Collaboration and Learning Environment
CSM	: Course (content) Management System
UK	: United Kingdom
NYU	: New York University
IT	: Information Technology
HELAM	: Hexagonal E-learning assessment model
KIE	: Kigali Institute of Education
FAQ	: Frequently Asked Questions
T	: Teacher
S	: Student

LIST OF TERMINOLOGY

VITRUAL LEARNING ENVIRONMENT: It is a set of tools which facilitate learning stakeholders to achieve learning goals in a complete or partial online environment. It is also known as Learning Management System or E-learning platform. Britain & Liber (2004).

PEDAGOGICAL CONVERSATIONAL FRAMEWORK: The framework against which the various used media support learning towards the fulfilment of requirements during an academic learning situation (Laurillard: 2008).

E-LEARNING: The American society for training and development (2009) defines E-learning as instructional content or learning experiences delivered or enabled by electronic technology

SAKAI: is an open source E-leaning platform used by UNISA, the E-learning platform to be assessed in this study, to construct and manage virtual academic learning place around the world (UNISA's website: 2009).

DISTANCE LEARNING: Distance education includes all forms of education delivered when teachers and learners are in different geographical locations (Ruhe and Bruno 2009).

BLENDED LEARNING: The mode combining face-to-face and online education delivery is referred to, by Osguthrope & Grahman (2003), as blended learning.

INSTRUCTIONAL DESIGN: The art of designing instructional interventions that promote student cognition, learning (Fresen 2005).

CHAPTER ONE: INTRODUCTION AND OVERVIEW

1.1 INTRODUCTION

This chapter starts with a problem statement and the research questions arising from the problem to be discussed in this study are clarified. The research consists of a critical assessment at a Local Level of UNISA's Virtual Learning Environment in Terms of the Pedagogical Conversational Framework. In this chapter, the aim of the study which consists on answering the research questions is stated. The rationale as well as the interest of the research has also been highlighted. An explanation of the organization of the study and concluding remark is included at the end of this chapter.

1.2 STATEMENT OF THE PROBLEM

In the 21st century, the use of Information and Communication Technology (ICT) in education has considerably altered the learning and teaching process (Panthazis: 2002). One of the fundamental changes has been the delivery of learning programs through learning management systems accessible via the Internet (Eduardo: 2007). This new way of delivering education, commonly referred to as E-learning, is gaining popularity because of its advantages namely access, cost effectiveness and flexibility (Bates: 1997). It is a mode of learning which brings remote students and teachers into contact through a virtual learning environment (VLE) also known as Learning Management Systems (LMS) or E-learning platform. The E-learning platform is a set of tools which facilitate learning stakeholders as mentioned above to achieve learning goals in complete or partial online environments.

Though the VLEs have various advantages, the quality and effectiveness of education delivered through the Internet worry education stakeholders in one way or another.

As Koszalka & Ganesan (2004) argue "Very little is known about when, how, or even if these systems promote or are able to 'manage' student learning" and efficiently help to achieve learning goals. One way to find out how effectiveness a specific VLE is, researchers conduct an assessment of the learning environment. Astin (1993) defines assessment as the gathering of information about everything that might conceivably influence the learning goals in the environment and use that information to determine the value or worth of the environment under consideration.

Ozkan, Koseler & Baykal (2009) state that, being multidisciplinary, VLE assessment has been a concern of many researchers in different fields namely computer science, Information systems, psychology, education, and educational technology. The research findings contributed to the E-learning assessment literature. However, as Britain & Liber (2004) state, E-learning platforms that make up virtual learning environments are usually assessed in terms of their features, technical robustness and cost. Pedagogical aspect, the most valuable factor in learning delivery process is rarely considered. Apart from considering how sophisticated the tools are, how much do those tools help in achieving learning goals or help in improving knowledge construction should be asked.

I agree with the argument in the JISC's Final Report (2003) which states that

> "E-learning is fundamentally about learning and not about technology. Strategic development of E-learning should be based on the needs and demands of learners and the quality of their educational experience."

Laurillard (2008) also supports the above argument by stating that progress in E-learning will mainly depend on how teachers design and use educational technologies towards learning improvement with an informed mind of how learning takes place. In that regard, Laurillard developed the pedagogical Conversational Framework[2] which

[2] The framework against which the various used media support learning towards the fulfilment of requirements during an academic learning situation (Laurillard: 2008).

can be used as a guideline for designing and assessing learning technologies. The Conversational Framework which summarizes the necessary learning activities was used as a set of criteria considered in assessing the local UNISA's VLE.

Based on the pedagogical Conversational Framework, the current study consisted of finding out how the local UNISA VLE has helped to effectively achieve learning goals.

This research focused on assessing the UNISA's virtual learning environment from which online learners staying in Rwanda undertake their studies. As UNISA's students and teachers are not at the same geographical location, the interaction between students and teachers is conducted through an E-learning platform. This study's concern was to evaluate a set of media tools embedded in the E-learning platform based on how these support UNISA's educational goals for effective online learning

1.3 RESEARCH QUESTIONS

The concerns of this research arise from the following research questions and related sub questions:

1. ***What are the learning requirements for an effective online academic learning situation?***
   1.1. What are the learning objectives in any learning situation?
   1.2. What are the required learning conditions specific to online learning?

2. ***Does the E-learning platform used by UNISA support students in meeting requirements for effective online learning?***
   2.1. What educational tools (media) are available on UNISA's online platform?

2.2. What VLE educational media are used by UNISA?

2.3. How are these media used to help in achieving UNISA's educational goals?

2.4. To what extent do these media help in Conversational Framework?

1.4 AIMS OF THE RESEARCH

The answers to these research questions will then be employed to analyze educational media used by UNISA and, how and at what extent these help to create the required learning conditions for an effective online academic learning programme.

1.5 RATIONALE

E-learning is regarded by its promoters as a solution for different group of learners because of the convenience and flexibility it offers in learning process. It allows students to have an individualized instruction and choose what and when they want to learn, they choose the pace and the place to undertake their studies (Zhang: 2003). Moreover, E-learning breaks geographical barriers through the E-learning platform accessible to students from anywhere provided that they have Internet connection. (Harasim and Johnson: 1986 cited in Hegngi: 1997).

While working in the field of instructional technology in higher learning institution, I became interested in doing research on how to improve E-learning platforms as well as practice related to their use to meet expectations of online learning stakeholders. The UNISA's virtual learning environment from which students based in Rwanda undertake their studies constitute the focus of this research. It will consist of a pedagogical evaluation focusing on which and how tools embedded in the UNISA's E-learning platform are used to deliver online education and facilitate education stakeholders to achieve learning goals. This study will be limited to the UNISA's online students staying in Rwanda and thus the results may not be reliably generalized to the whole UNISA learning environment. However it will reflect the

reality in countries with the same online learning facilities and educational practices as Rwanda.

Eccles (1991) states 'what gets measured gets attention'; which means that one way to ensure that learning objectives in E-learning will be achieved is through the assessment of virtual learning environment from a pedagogical perspective. A number of studies aiming at the assessment of E-learning platforms have been conducted but they were usually limited to technological features, technical requirements, cost and paying less or no attention to pedagogical aspect (Britain & Liber : 2004). As observed from Joint Information System Committee Report (2003) there may be a threat to educators because that practice may lead to a technologically-driven education despite the intention that this technology is there to assist education towards its goals achievement.

The lack of consideration of the pedagogical dimension while assessing VLEs may lead to the degradation of education standards because emphasis is put only on technological tools and instructional design is ignored. The current study is an assessment on how technological tools serve in teaching and learning process in an online environment. The Conversational Framework as summary of essential learning activities will be used to conduct this pedagogically driven assessment with a critical appreciation of electronic tools embedded in VLEs.

I praise the effort invested by Britain & Liber's (2004) in suggesting a pedagogical driven assessment. Britain & Liber's (2004) used a framework for pedagogical evaluation of Virtual Learning Environments which considered two models: educational model based on Laurillard's Conversational Framework and organizational model based on Beer's Virtual System Model. The framework used by Britain & Liber (2004) consider the pedagogical dimensions, the most relevant aspect in any mode of education delivery, and contributes in improving E-learning practice. However, its methodology collects information only from platform

developers, institutions' staff and teachers' appreciations. The current research, in addition to Britain & Liber's consideration, will take into consideration learner experience in Virtual Learning environment.

This research, which mainly aims at the improvement of the E-learning practices, is motivated by the following needs:

- Effective learning in virtual learning environment;
- Promote pedagogical driven practices in E-learning environment;
- Clarify the situation of virtual learning environment in developing countries like Rwanda; and
- Serve as guidelines for universities delivering or planning to deliver online education.

1.6 INTEREST OF THE RESEARCH

The research is relevant to the following group of people:

- Educational technologists: This is because it will discuss a list of minimum pedagogical requirements for a successful virtual learning environment, a set of criteria to be considered while selecting an E-learning platform and thus help in planning the E-learning projects.
- Online course Instructional designer: basing on the explanation of the Conversational Framework, these designers will have a good understanding of how learning takes place in academic environment and will design online courses accordingly.
- E-learning platforms developers: These developers can use the research as a guide while building new or improving the existing platforms.
- Policymakers in higher learning institutions would find this research helpful because it can assist in setting up the standard profile required for an online

university to be built. This will help to maintain education quality as E-learning field is developing fast.

- For researchers: this study is one step in a long process of improving E-learning practices and may open doors, serve as a basis for further researches.
- UNISA: This research would be of great importance to the UNISA community as it will inform its administration, academic units as well as their students about the situation of the UNISA's online learning environment from a pedagogical perspective and particularly the learning environment of the UNISA's students in Rwanda.

1.7 ORGANIZATION OF THE STUDY

CHAPTER ONE	: INTRODUCTION
CHAPTER TWO	: LITERATURE REVIEW
CHAP THREE	: THEORETICAL FRAMEWORK
CHAPTER FOUR	: METHODOLOGY
CHAPTER FIVE	: PRESENTATION OF FINDINGS
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1.8 SUMMARY

This chapter introduced the focus and rationale behind this study. Research questions and sub questions that will guide each step of this study have been stated. Aims and interest of the research have also been clarified. The chapter ends with a section summarizing how the study will be organized, the main chapters are listed. The following chapter explores the literature related to the current study.

CHAPTER TWO: LITERATURE REVIEW

2.1 INTRODUCTION

Vithal & Jansen (2002) state that a literature review provides the summary of the existing core of knowledge on the topic under study. Guided by the research questions stated above, the current review will critically summarize what has been written about E-learning environments, effective online learning, and assessment of virtual learning environment.

2.2 E-LEARNING OVERVIEW

2.2.1 DEFINITION OF E-LEARNING

The American society for training and development (2009) defines E-learning as instructional content or learning experiences delivered or enabled by electronic technology while Reeves (2001) defines the same concept as "content, task, problems and most importantly feedback and collaboration mediated through a networked computer".

The current research will emphasize on how electronic media in online environment facilitates educational delivery. For the purpose of this study, E-learning can be defined simply as a mode of education delivery supported by electronic media integrated in web based applications accessible through the Internet.

Nowadays, the electronic tools used to deliver education remotely are grouped together and makes up what is commonly known as E-learning platform, Learning Management Systems (LMS), Virtual learning environments(VLE) or Course

Management System (Chavan, 2004). VLEs will be discussed later in the current study.

E-learning and Distance learning are mistakenly used as synonyms. (Clyde and Lee-Post: 2006). Though those two types of learning delivery have a lot of similarities, it is important to recognize their differences as it will be discussed in the following section.

2.2.2 E-LEARNING VS DISTANCE EDUCATION

Both E-learning and Distance learning provides more access to knowledge and flexibility than face-to-face learning. Unlike face-to-face learning where students and teachers meet at the same time and place so that they can interact to achieve learning objectives , E-learning and distance learning offer to students the possibilities to determine the time, place and the pace of instruction (Piccoli et al: 2001). As students can access study materials, learn and work on class tasks without physical interaction with their teachers, their learning becomes more flexible than in face-to-face learning environment.

However, the benefits expected from the two modes of learning depend on different factors. The Critical factors (these will be discussed in following sections) have to be carefully considered during each stage of the E-learning program development.
The common features of E-learning and distance learning are flexibility, extended access to knowledge, non physical interaction between teachers and learners. These features are the key differences between face-to-face and the two models of delivering education remotely.

Schlosser &Simonson (2006 cited in Ruhe and Bruno 2009) define Distance Education as ‘a generic, all inclusive term used to physical separation of teachers and

learners'. Distance education includes all forms of education delivered when teachers and learners are in different geographical locations.

While Distance education is generic term used for remotely delivered education, E-learning is a term used specifically for an instruction program delivered through the Internet or other electronic media (Ruhe and Bruno 2009.)

It is important to differentiate those two types of remote education delivery because these use different forms educational media. Distance education mainly makes use printed of study materials which are sent to students situated in different parts of the world, it is mainly paper based. In E-learning, the Internet technology along with electronic tools embedded in Virtual Learning Environment are used to deliver online education. This study will focus on electronic media used to deliver education in E-learning.

2.2.3 CATEGORIES OF E-LEARNING

Ruhe and Bruno (2009) states that E-learning can be categorized into two environments which are synchronous and asynchronous.

In synchronous E-learning Environment, students and teacher(s) engage in a live interaction through the Internet technologies. It is an environment whereby the Internet technologies are used to create a virtual learning space similar to the traditional classroom, lecture or meeting. All course participants have to be connected to that Virtual learning space (Takalani: 2008.)

Ruhe and Bruno (2009) add that :

> "Synchronous E-learning environment is characterized by different types of interactions through chats, real-time audio, application sharing, whiteboard, Webcasting, video teleconferencing and so on"

and it is through those electronic media that simultaneous interactions takes place.

unlike synchronous, asynchronous E-learning environment does not require teachers and learners to be online at the same time. Communication between participants is not instant, the learner can determine when and from where to access the courses and learn at his/her own pace. Asynchronous E-learning is supported by podcasting, forums, email, and web content and so on.

The case study of this research is the UNISA's Virtual Learning Environment where online learners from Rwanda undertake their studies. Those learners study in asynchronous mode.

2.2.4 BENEFITS OF E-LEARNING ENVIRONMENT

The use of computer and the Internet technologies in education is increasing and significantly changing ways of learning and teaching. (Katz and Oblinger 2000).
Educational institutions are investing efforts in integrating the ICT in education to facilitate or improve the instructional program delivery (Mohamed 2004). That tremendous move towards the use of educational technologies is motivated by the expected benefits in terms of improved access and quality of/ to education, flexibility, cost reduction. However, as I mentioned above, E-learning can only be beneficial if its planning, implementation and follow up are conducted carefully and with serious consideration of the factors influencing the effective E-learning.

E-learning is one of the most popular applications of ICT in education. It can provide a number of benefits to both teachers, learners and to an institution.
Mohamed (2004) states that "For learners, online learning knows no time zone. Location and distance are not an issue". E-learning breaks geographical, temporal, spatial barriers which have been hindering the learning and teaching process in face-

to-face education. E-learning extends access to education. Learners in remote areas, and fulltime workers can undertake their studies from where and when it suits them. E-learning provides flexibility in terms of pace and doesn't constraint the learner to be in specific area like classroom at a specific time.

Kruse, K. (2002) summarizes the benefits of E-learning for students as follows:

- On-demand availability : Students can access the course anytime and from anywhere,
- Self-paced studying: each student has the possibility to determine the learning pace. Slow students can take as much time as they need to understand the content and quick students can skip the content that they feel comfortable with and gain time. This can contribute to reduce students' stress and increase their satisfaction.
- Interactivity in E-learning is most of the time text-based. Learners have time to reflect on what their communication before they post them on the Learning Management system. Learners can easily interact with their teacher or with other learners through forums, chat or email.
- Confidence: the availability and accessibility of course material and references build learners' self-confidence. This is also associated with taking responsibility of their learning.
- Cost: E-learning courses are less expensive than ones offered in face-to-face environment because some infrastructure related costs like buildings, electricity, furniture, projectors are not incurred.
- Encourage active learning: as supported by the constructivist view, learner is not a recipient where teachers will pour knowledge but rather the knowledge co-constructor who learns from expert through experience and socialization. E-learning, by making students more responsible to their learning, gives them more opportunities to discover and construct or connect the new knowledge over the existing ones.

For the instructors, teaching can be at anytime and from anywhere (Mohamed: 2004). A teacher can agree with learners on the time for a virtual synchronous class and can conduct a lecture/lesson without physical meeting. It doesn't matter where participants are located, the only requirement is to be connected on the E-learning platform. Asynchronous communication provides more flexibility because participants do not need to be connected at the same time.

The teacher can change the online material from anywhere and at anytime and learners will check the updates whenever it suits them. As the learners can directly and confidentially address their queries to the teacher through email, it can help the teacher to adjust the teaching strategies to meet students' needs. This will help to achieve learning outcomes and learners' satisfaction. The teacher can also follow each student and give appropriate instructions towards better performance. (Mohamed: 2004)

The benefits of E-learning are not enjoyed only by teachers and learners but also the Institution delivering the online instruction. The increase in numbers of students, courses offered and degrees delivered contributes to the growth of the return on investment for the higher education institution.

Electronic media support all interactions which take place in VLE. If these electronic media are not handled efficiently, then none of the above mentioned benefits will be realized by education stakeholders. The assessment of VLE's educational media is of utmost importance for the success of E-learning because it helps to diagnosis the weaknesses and strengths of the system tools for a better performance. Laurillard's (2008) Conversational Framework will be applied to conduct a pedagogically driven assessment of the electronic educational media used by UNISA's against the learning activities undertaken by online learners based in Rwanda and their teachers.

Moreover, E-learning benefits are not easy to achieve as there are a number of factors hindering the success of E-learning. These drawbacks need to be identified so that E-learning stakeholders can work on strategies to prevent or overcome them.

2.2.5 DRAWBACKS TO E-LEARNING

Although E-learning provides several benefits which can contribute to the improvement of learning and teaching practices, it has its drawbacks like any other educational delivery method.

Some of the aspects hindering the E-learning take-up in educational institutions are common to both students and teacher namely: lack of knowledge and experience with computer technology, technical malfunctions, time, work overload, lack of technical support and cost of hardware. Besides the issues related to the technical knowledge, E-learning may sometimes contribute to the degradation of education quality. The most apparent cause is that teachers have difficulty with designing learning material which can both include the readings and explanations that were usually given in a face-to-face mode. It becomes more complicated when the skills to be learnt involve practical activities, because it requires more advanced skills in ICT.

Lucas (2004) stated that the most important constraint experienced by online learners is their prior lack of prior knowledge and experience with the use of computer technology. This is not only a problem of learners because most of teachers moving to E-learning also experience problems with the use of computer in general and the E-learning platform in particular. Being familiar, for both learners and teachers, with the use of computer and the Internet technologies is crucial to the success of any E-learning program. Before starting an online instruction, participants have to get special training on how to use the E-learning system. Failure to do that imposes much stress on the participants and becomes an unreasonable task for students to achieve the targeted learning outcomes.

When the system is malfunctioning, it delays the course progress and discourages both learners and teachers. Some E-learning platforms' errors can only be fixed by experts from the system development company. Not only are these problems expensive to fix and time consuming but also the outsourced IT may be too busy or too far to immediately attend to the client's complaints.

In developing countries, access to the computer and Internet connection for both students and teachers is still limited. In this situation, E-learning can be compared to a school with limited classrooms, books, staff rooms and teachers. This is one of the major barriers to the E-learning success in developing countries and it is commonly referred to, by as the "digital divide".

Apart from these aspects that affect both teachers and students, there are issues particularly faced by online learners and they are summarized by Kruse, K. (2002) as follows:

- A new mode of learning: E-learning is a mode of learning which requires special kind of support/ assistance from the teacher or system administrators. It also requires high level of self motivation from students as well as access to the adequate computers and Internet. Salmon (2003) states that "not all students are suited to it, and even those who are suited still require some form of support in the initial stages of the transition". This means that students needs to be trained on how to access the course content , carry out tasks , conduct practical assignments, interact with teachers and colleagues, submit completed tasks and other skills related to the efficient use of Online learning. The design of online learning induction courses requires a lot of effort and it may discourage the course designer to include the induction program in the curriculum, some course designers may even ignore how important is the induction programs for the success of online learning. Learners who have not been trained on how to use

LMSs get confused for a long time if not for the whole duration of their E-learning course.

University students may be considered to have the ability of directing themselves but Knowles (1980) believes that it is not wise to "just throw them into the strange waters of self-direction and hope they swim". Students moving to a new learning environment, no matter how they easily cope, need to be supported during their first days of transition to prevent frustration. Dewey (1938) supports the above argument by stating that, "if we 'replace external control with self control', we must, in every self-directed learning situation, systematically prepare the student for this challenge" .

- "Information overload" is another factor discouraging students during their online studies. At some extent the teacher's responsibilities are attributed to students. A big part of online instructional content are text based and due to the lack of the face-to-face interaction , students will have extra readings to replace the explanations, clarification which could have been given by the teacher in face-to-face environment .
- Passive interaction**:** although E-learning platforms provide tools which facilitates synchronous and asynchronous interaction among participants, Students used to physical interaction may feel isolated from others and especially their teachers.
- No socializing / Lack of physical Interaction: **"**In ancient times, learning networks occurred within one's immediate family, community, and tribe" Desanctis (2003). Today people go to schools, colleges and universities or other educational institutions to acquire knowledge in different fields.

  One way that Learning occurs is by interaction within those institutions. Takalani (2008) was interested to find out if people can share information, form strong working relationships, and develop insight and understanding when their interaction occurs primarily via electronic media.

In addressing this question, he found that "the interruptions and lags associated with asynchronous communication can disrupt conversational routines and potentially hinder (tacit) learning, which relies on deep and subtle information exchange" Desanctis (2003). Takalani (2008) explains that lack of face-to-face contact among participants make relational ties more fragile.

- Cost and time of printing: being self directed method of Learning, E-learning involves a number of text-based materials. Face-to-face does require time and financial resources for printing but E-learning requires more because explanations and practice instructions have to be uploaded on an online learning platform in text-based format. Student without access to the computer at their residences will often have to print the whole course material.

I agree with Bonk and Reynolds (1997) who argue that

> "To promote higher order thinking on the Web, online learning must create challenging activities that enable learners to link new information to old, acquire meaningful knowledge, and use their metacognitive abilities; hence, it is the instructional strategy and not the technology that influences the quality of learning."

For teachers, factors negatively affecting E-learning are mostly instructional design related. Not only is E-learning new to most of the teachers and they do not understand how it works but also the designing of an online course requires more time, skills and commitment from teachers.

The online learning environment involves new instructional media and practices; teachers have to re-conceptualize their teaching to meet the needs of online learners. This requires a considerable time from teachers whose workload is already heavy. They need to fully understand the structure of the new environment, feel comfortable and confident. New teaching strategies have to be applied to fit in the new environment.

The quality of courses offered, cost, security and cultural acceptance are reported by Takalani (2008) as the most well-known fears for institutions when it comes to embarking on E-learning projects.

- The quality of online courses is a major concern of education stakeholders around the world. Gallick (1998) states that there is a threat that online learning may commercialize education and lower the learning and teaching standard or even undermine the value of university degrees.
- The cost of initial installation of an E-learning platform is high. Up-front investment required for acquiring an E-learning solution is huge due to infrastructure and human resources costs.
- Security of sensible information exchanged on E-learning platforms is another issue making institutions reluctant to invest in E-learning projects. (Weippl: 2005). With hacking technologies, sensitive data like marks, private emails and so on maybe accessed by unauthorized registered users or merely user who are not even registered to the system.
- The lack of cultural acceptance or resistance to change is a situation whereby both students and teachers may prejudice themselves against using computers and related technologies at all, let alone for E-learning.

After discussing the pros and cons of E-learning, the immediate question which comes to mind is to know if institutions, teachers or learners should or not go ahead with E-learning programmes.

My view on this matter is that E-learning provides flexibility, affordability and extended access to knowledge that can hardly be provided by face-to-face mode.

Moreover, learners in this modern age are excited with new technology as they believe that it can transform their lives in better way with less effort. In the near future, it will be easier to motivate learner to undertake studies through new technologies instead of in a traditional way. Concerning the E-learning drawbacks, I argue that undergoing studies and new technological development are focusing on how to prevent or overcome those negative sides of E-learning. The identification of

the E-learning drawbacks is one step towards improvement of educational practices as well as the efficiency of VLEs.

Taking into consideration the above discussion, the advantages of E-learning outweigh the drawbacks. However, the above statement is valid under following conditions. The use of VLE tools should be guided by the role those tools can play in the learning and teaching process. The attempt to overcome E-learning drawbacks should be guided by the critical factors for effective E-learning. This study contributes to meeting the above conditions as it will consist of an assessment of tools used in a local UNISA's VLE to ensure a smooth interaction and knowledge construction in virtual teaching and learning process. Laurillard (2008) provides a framework appropriate for such exercise and will be used to assess the local UNISA's VLE.

The following part of this literature review will address the understanding of VLEs and critical factors to its effectiveness. It will also discuss the issues related to VLE assessment.

2.3 VIRTUAL LEARNING ENVIRONMENT

2.3.1 DEFINITION

Virtual Learning Environment is defined by Martins & Kellermanns (2004) as:

> "a web-based communications platform that allows students, without limitation of time and place, to access different learning tools, such as program information, course content, teacher assistance, discussion boards, document sharing systems, and learning"

VLE is a set of tools which allows students and instructors to interact in an online environment through the Internet and other electronic networks in order to achieve

learning goals. It also provides tools for course management. There are now a lot of VLEs and the number keeps increasing on the market. Some VLEs are open source while others are proprietary softwares. VLEs may differ on cost, robustness, efficiency and so on but they are all web applications and almost share a number of specific standard functionalities. The following section explains VLE structure.

2.3.2 VLE STRUCTURES AND STAKEHOLDERS

VLE can either be used to deliver education entirely in an online environment or as a complement of face-to-face class (Berge 2002). The mode combining face-to-face and online education delivery is referred to, by Osguthrope & Grahman (2003), as blended learning.

While there are numerous E-learning platforms, made up with different tools different from each others; Britain & Liber (2004) came out with features present in a prototype E-learning platform. Features of VLEs are schematically represented below:

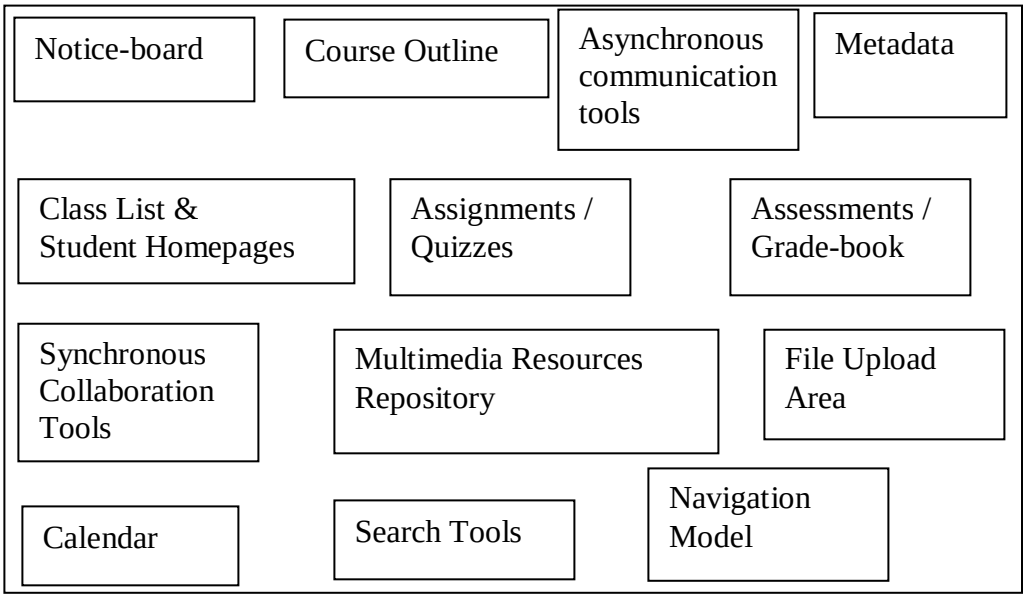


Figure 1 : Tools of standard E-learning platform
Source: adapted from Britain & Liber (2004).

VLE users are divided into three groups: Students, teachers and administrators. Whilst teachers have a similar view of the system to students they will usually have additional tools and privileges that allow them to add materials, create conferences and track student's progress. The VLE administrators have all privileges on the system; they have overall rights of access and administration.

Below, the features of VLE tools mentioned in the figure are explained (Britain & Liber 2004):

- Announcement tool also called Notice-board is a useful area on the system which helps the lecture to communicate a very important message to the virtual class. It is a very efficient communication tool because the message appears as soon as a learner logs in to the system.
- Course Outline provides necessary information about the course structure and clarifies the expectations from the course as well as what is expected from learners. It generally includes the course objectives, course content overview, teaching/learning methods, required and recommended readings, evaluation, satisfactory performance requirement and any other information which may be helpful for students to achieve their learning objectives. Some virtual learning provides the possibility of designing the course home page like a course outline. Others allow the teacher to upload the course outline and make the link accessible on the top of the course home page.
- Asynchronous communication tools: As defined by Skylar (2009), asynchronous communication occurs when message transmission and reception does not take place at the same time. VLEs include a number of asynchronous communication tools to facilitate communication between teachers and learners or between learners among themselves. Email and forums are the most popular VLE's asynchronous communication tools and are described below.

  - E-mail, most VLEs include a built-in email messaging system which helps the registered participants to communicate privately. It can be used when a student wants to communicate to the tutor or vice versa. Students can also send messages to each other.
  - Forums are online discussion boards where students and teacher can communicate through messages sent from anywhere, anytime. As Cole & Foster, (2008) describe this tool is very important because for some students it increases the level of interaction compared to face-to-face, like shy students or those with a language barrier. Moreover, recordings are easily accessible because one can check discussions posted one week or months ago

- Class List & Student Homepages: another key feature of a learning environment is the facilitation of social interaction between the participants. It is important to know the classmates or for the teacher to get some idea of learners backgrounds, interests and aspirations. Many VLEs incorporate a list of registered participants and provide a link to their system email addresses. The user can get the list of classmates and communicate easily with them.
- Metadata in VLEs are tools which aim to provide information about the systems object or tools. Metadata provides definition and the use of the objects, sometimes the credits for the object creator. Metadata are important because they help participant to be familiar with the VLE.
- Assignments: VLE allows teachers to assign a work to their students by specifying expectations, deadlines and other task related instructions. It also provides a means for students to submit completed assignments to teachers for grading and feedback.
- Assessments: Some VLEs provide automated on-line assessment tools namely multiple choice tests, matching, or short answer questions. Those assessments tools are often found under ‘quiz’ VLE tool. They often allow instant grading.

- Synchronous Collaboration Tools: These are tools which unable real-time communication within VLE. Participants who are connected to the system can communicate in a "same time-different place" mode. (Soren 2010).
- Synchronous collaboration tools such as chat facilitate online instant messaging, shared Whiteboards or simply the virtual board accessible to all connected participants, application sharing like Google Doc3 [4]and online conferencing are a feature of some of VLEs.
- Multimedia resources defined on, Webdictonary site: 2010, as "A combination of several media types in a single digital object or collection, e.g., images, audio, video" contribute considerably in delivering online learning. These are helpful to online learners as they improve their course understandings. Some types of course content are difficult to explain through text based medium.

  Multi-media files can be stored and accessed within the VLE as an integral part of the course package.
- File upload area: VLE extends the uploading facility to students so that they can share their work or resources found from other sources. This encourages the active learning as it involves students in their knowledge construction process instead of merely being recipients of content.
- Calendar tool is a useful component of VLEs; it helps the virtual class to develop a common and accessible to all diaries. The submission deadlines, end of enrolment, conference dates, and so on can be indicated by the teacher and be shared to the whole class.
- Search Tools: one of the most discouraging moments to online students is when they cannot find the content available on the system. It often happens when large resource base of materials is built up within the VLE. To ease the online course

[4] Google Docs is a free, Web-based word processor, spreadsheet, presentation, form, and data storage service offered by Google. It allows users to create and edit documents online while collaborating in real-time with other users. (Wikipedia 2010)

navigation, VLE incorporates search tools which help participants to easily find the subjects of interest or a particular person.

The VLE structure described above is generic and may not include less or more tools present in different individual VLE. As Britain & Liber (2004) explain, the above structure provides "an overview of what to expect from a VLE and describes the most prevalent current model of a VLE architecture above, that is the Web-client and Server approach"

In this 21st century, the most popular and used VLEs in the world as reported on, Wikipedia (2010), are MOODLE, SAKAI and Web-CT.

The efficiency, stability and reliability of VLE tools are crucial aspects in delivering online education. I agree with Laurillard (2008) who states that "The development of learning materials is important, but deliver is paramount". Apart from the development of online learning material which has to be done carefully and intelligently, the delivery has also to be shrewdly considered. The second research question of this study aims to find out if the E-learning platform [integrated electronic and education media] used by UNISA supports in meeting requirements for effective online learning for the students based in Rwanda.

For a better understanding of our case study, I suggest that the E-learning platform used by UNISA be described.

SAKAI is the open source E-leaning platform used by UNISA, VLE to be assessed in this study, to construct and manage virtual academic learning place around the world (UNISA's website: 2009). As it will be described further in this research report, SAKAI has all the features indicated in figure 1 (Sakai website: 2009). The current research will emphasize on evaluating how SAKAI is used by the UNISAs students based in Rwanda and their teachers to meet the educational requirements for effective learning to take place. Before exploring the literature about the requirements for an online learning to be effective, SAKAI structure is described below.

2.3.3 UNISA E-LEARNING PLATFORM

SAKAI, being the E-learning platform used by UNISA, reflects the UNISA's Virtual Learning Environment structure

SAKAI might be called a Course Management System (CMS), a Virtual Learning Environment (VLE) or Learning Management System (LMS). Whilst Sakai is typically used for teaching and learning (like Blackboard and Moodle), its developers call it a Collaboration and Learning Environment (CLE) because it embraces uses beyond the classroom like collaborative Researches. (Sakai Website: 2010) SAKAI tools and features are summarized in the following table:

General Collaboration Tools	*Teaching and Learning Tools*
- Announcements: Post current, time-critical information to a site. - Resources: Post, store and organize material related to the site. - Site Roster: View a list of site participants and their pictures - Email Archive: Access an archive of email sent to participants - Wiki: Create and edit web content collaboratively. - Blog: Provides blogging capability for your class. - Calendar: Maintain deadlines, activities and site related events - Chat: Engage in real-time conversations with site participants - Discussion Forum: Create, moderate and manage discussion topics and groups within a course and send private messages to site participants. - Glossary: Provide contextual definitions for terms used on a site - Web Page: Display external web pages. - News: Display custom news content from dynamic, online sources via RSS.	- Syllabus: Post a summary outline of course requirements - Lesson Builder: Create and publish online learning sequences. - Assignments: Create and grade online or offline assignments. - Drop Box: Share files privately with site participants. - Grade book: Calculate, store and distribute grade information to students - Tests & Quizzes: Create and manage online assessments

Portfolio Tools	*Administrative Tools*
- Design, publish, share and view portfolios of work - Wizards & Matrices: Create structures to help site participants document and reflect upon their learning and development - Evaluations: Provide site participants with summative feedback on submissions to wizards and matrices - Reports: Build, view and export reports on portfolio-related site activity - Layouts & Styles: Manage pre-defined Styles used to control the visual style (fonts, colors, etc.) of Wizards and Matrices, and Portfolios - Portfolio Templates: Manage templates site participants use to create standardized portfolios	- Accounts: Manage basic account information and passwords - Membership: View and modify site memberships - Site Setup: Create new sites, modify sites you own - Site Editor: Change the structure, content or membership of a site - Section Info: Manage sections within a course site - Super User (SU): Assume the identity of another user in the system for troubleshooting and support - Users: View and edit user data in the system - Realms: Manage roles and permissions - On-Line: Track server and system usage - Job Selector: Create scheduled data integration and data warehouse tasks

Table 1 : SAKAI tools and features
Source: http://sakaiproject.org/features 2010.

2.4 EFFECTIVE ONLINE LEARNING

Online education is significantly growing around the world because it provides more access to knowledge, flexibility and cost effectiveness. (Cole: 2000). Students, even full time workers, can undertake online from anywhere, anytime, at any pace and comparatively pay less than what they should pay in traditional learning. However , Masoumi (2006) states that different researchers [Romizowski (2005) , Oliver (2005), Garret (2004), Oppenheimer (2003) and Rada (2001) revealed that many E-learning projects failed to meet their objectives as well as students' expectations. They give examples of UK-University, NYU online, Scottish Knowledge, University 21 and Global University Alliance. Those cases of failure lead many researchers to question the quality, capability and the effectiveness of E-learning as a mode of education delivery. Levy (2006) states that E-learning stakeholders should be aware and understand the critical factors to the effectiveness of the Online learning environment.

2.4.1 CRITICAL FACTORS TO THE EFFECTIVENESS OF ONLINE LEARNING

Contributing to the effectiveness of online learning environments, many researchers came up with factors that should be considered while planning, implementing and evaluating the Online learning programs. The figure 2 summarizes the findings of different scholars in the field.

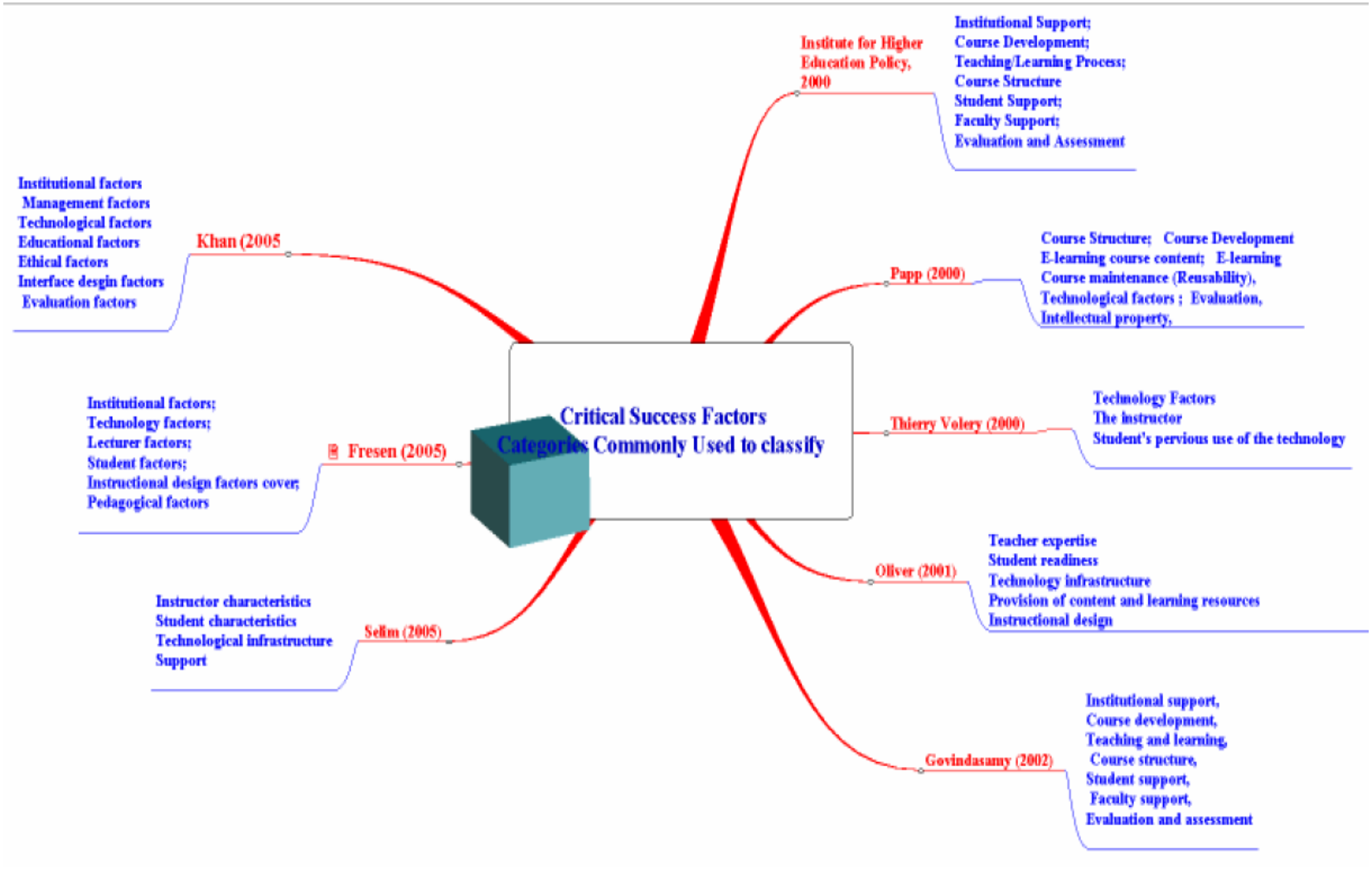


Figure 2 : Critical Success factors for online Learning
Source: Masoumi, D : *Crucial conditions for effective E-learning*. (2006)

For VLE to be advantageous, critical factors have to be taken into consideration. Researchers proposed different critical factors which can be classified into main factors combining sub factors.

Masoumi (2006) proposes three main factors namely pedagogical, technical and factors contributed to learner as main role player in the E-learning environment. I partially agree with the Masoumi's classification. Pedagogical and Technological factors are the main factors and combine a number of factors mentioned by other researchers.

However, the last main factor mentioned by Masoumi (2006) can be considered as a sub factor under pedagogical dimension. Instead, the third main factor should be Management as it deals with the administration and organization of the VLE. Thus, Pedagogical, Technological and Management can be considered as main critical factors for effective online learning

The E-learning advantages like more access to knowledge, flexibility and students' active learning are condition to the pedagogical critical factor. The learning materials to be uploaded to the online learning systems have to be well designed. The learning materials have to be designed in such a way that it will facilitate the students to learn at their own pace. Sessions have to be concise, understandable and should convey a complete idea.

Like in other mode of learning experiences, students should have prerequisite knowledge related to the subject to be learnt. In E-learning situation, learners as well as their teachers need to have adequate skills on how to use the computer, be familiar with the Internet technologies and specifically be able to interact with the E-learning system. Pedagogically speaking, it is unreasonable to expect students to undertake online studies when they are not comfortable with the learning environment.

Efficient online learning will not at all take place if education delivery is inadequate; this implies that VLE's tools design and use should be guided by their ability to facilitate online education stakeholders in achieving learning and teaching goals.

Some E-learning drawback like the quality of online education, cultural acceptance and feeling of isolation can be dealt with by considering the pedagogical factors during the conception and development of E-learning.

A pedagogical assessment conducted on regular basis is one way of identifying the strengths or weaknesses of the system and the participants towards a better performance.

Technological factor is crucial and interrelated to the pedagogical one. The extended accessibility, flexibility and reduced cost cannot be beneficial to online education stakeholders without having high standard technological tools. Online interactions and all learning activities are facilitated by the tools integrated in VLE. The infrastructure issue falls into the technological dimension. Access to the computer and reliable Internet connectivity has also to be carefully considered. E-learning does not make any sense if participants do not or have limited access to the computer and Internet connectivity. The extended epistemological (knowledge) access that E-learning provides is function to the physical (computers and Internet) access.

The new technologies can also help to improve the quality of online education in one way or another, tools detecting plagiarism encourages students to invest more efforts in their learning instead of copying and pasting other people's work. Well designed VLEs provide quick link to information about each tools and it helps participants to understand the system functionalities by themselves.

Pedagogical and Technical factors deserve a great consideration in all E-learning projects. However E-learning like other educational projects needs organization and coordination of activities and it brings in the managerial aspect.

As summarized in the following sections, those main factors incorporate other sub factors.

2.4.1.1 PEDAGOGICAL FACTOR

Any institution concerned with creating a meaningful E-learning environment has to consider the pedagogical factors from the outset. Schramm (1977) states that learning/ teaching process is influenced more by the course content and instructional strategy than by the type of technology used to deliver instruction. According to Khan (2005), the pedagogical dimension involves analysis of course content, audience or learners, course objectives as well as the instructional media. Online course design, learning strategies and course organizations are other pedagogical factors mentioned by Khan (2005). However, the pedagogical factors can be more than those mentioned above because as the author (op.cit) argues "pedagogical factors encompass all teaching and learning related activities". It means that some dimensions considered separately like resource support, evaluation and ethical issues can also be included under pedagogical considerations as these are components of online teaching and learning process.

2.4.1.2 TECHNOLOGICAL FACTORS

Though pedagogical factors are essential while designing, implementing or evaluating any learning environment; technological considerations are also crucial in online learning environment. The technological factor deals with technological infrastructures that form the backbone of an E-learning entity. Technological infrastructure is defined by Guribye (2005) as the ensemble of equipment, techniques, applications whose efficiency can be characterized in terms of *availability and reliability, the adequate functionalities, usability and integration into existing infrastructure.*

As access to technological infrastructures is a prerequisite for E-learning establishment, technological issues need to be addressed to ensure an effective online

learning delivery. Fresen (2005) claims that reliability; accessibility, appropriate use and data management of the Online learning platform as well as IT support and training for online learning stakeholders are the technological factors that have to be taken into serious consideration for a successful E-learning environment. However, Fresen (2005) separates infrastructure and technological plan from other technological factors and includes these under 'institutional factors'. In addition to the factors mentioned by Fresen, infrastructure planning, hardware and software should also be included in the technological factors as suggested by Khan (2005). A combination of factors considered by those two authors makes more sense because the technological dimension has to include all factors related to the planning, installation, use, and maintenance of the Learning Management system. The technological dimension should also include Interface design (considered separately in Khan's taxonomy).

2.4.1.3 MANAGERIAL FACTORS

While the teacher and learner are the main stakeholders in the online learning environment, they need support in terms of administration and organization. Student registration, human and non human resource management, and coordination of all activities from design of the VLE stage to the online education delivery and maintenance stage are managerial factors critical to the effectiveness of the VLE (khan 2005). Management defined as a process of planning, organizing, staffing, directing and controlling an organization (Wikipedia: 2010) encompasses what Khan included in Institutional factors (organizational, administrative, academic affairs, and student services)

As Khan (2005) argues '*many of these factors are interrelated and interdependent'*. This implies that it is essential for online program designers to consider all those factors for effective online learning. In order to achieve learning and teaching

objectives, technology conception and development should be guided by pedagogical principles. As for Management, all activities need to be coordinated for optimal results.

This study focused on the pedagogical factor and specifically the assessment of media tools integrated in VLE. Though the pedagogical factors constitute the guideline for other factors in the assessment of VLE, the pedagogical assessment will indirectly assess technology of the VLE. Management factor could not be assessed as it goes beyond the scope of the present study, It involves the whole institution while the present study focus on a UNISA's local VLE.
To gain a better understanding of pedagogical factors which guided the VLE assessment, I will discuss the pedagogical objectives and aspects of teaching/ learning processes in online environment (also valid in the face-to-face environment) in the following sections.

2.4.2 OBJECTIVES AND ASPECTS OF EFFECTIVE ONLINE LEARNING

As outlined in the problem statement of this study, "E-learning is fundamentally about learning and not about technology. Strategic development of E-learning should be based on the needs and demands of learners and the quality of their educational experience." JISC: Joint SFEFC/SHEFC E-learning Group: Final Report (2003)

The statement above entails that the use of technology in education should always be guided by pedagogical factors. Development of educational technology is moving fast. There is hype all over the world associated with online learning which may mislead educators who think that their teaching improvement will depend on how much technology they have integrated. The use of different technologies in education is not a bad idea as such but more effort need to be invested in finding a way in which

technology can help to improve learning and teaching. The emphasis has to be put on technologies which brings added value to the education.

The JISC report (2003) states that effective online learning, as with any other model that facilitates learning, should achieve following objectives:

"

- Engage learners in the learning process;
- Encourage independent learning skills;
- Develop learners' skills and knowledge; and
- Motivate further learning."

Prosser and Trigwell (1999 cited in Laurillard 2008) states that during the learning process, students are engaged in three successive phases: acquiring the concepts of the discipline, knowing and applying the acquired knowledge where needed in everyday life. The student's progress in regard to the above successive phases is strongly influenced by student-teacher interaction. Laurillard (2008) believes that the interaction between student, the teacher, and the world is the central pillar of learning process. Laurillard (2008) elaborated five aspects of learning process that will be explained in the next section. She explains roles students and teacher should play on each aspect of the learning process.

a. Apprehending structure

Laurillard (2008) states that learning in Higher education often takes place through acquisition. Lecture or readings expose to students alternative ways of looking at the world which is usually different to the one they have known through experience. To achieve the learning objectives, students need to correctly interpret each meaning given through lecture or readings. As meanings are given through structures, the latter have as well to be understood without ambiguity. For student to understand the course content and be able to organize it in a coherent and holistic way, there are specific roles which have to be played by both students and teachers. Teachers must

explain and clarify structure to students; negotiate topic goals and assess the students' understandings about what they have learned. Students have to look for structure, comprehend the topic objectives and establish the relationship between course goals and their understanding.

In the virtual learning environment, the aspects of comprehending structure are facilitated by electronic tools. VLEs are expected to provide adequate display and communication tools to allow the teacher not only to effectively publish the material but also to design and encourage the mathemagenic[5] activities. Students will also use communication tools to express their ideas and address their issues for assistance

b. Interpreting forms of representation

Learners need to make sense of the acquired theories in terms of practice work and vice versa. Activities which enhance the students' ability to establish relationship between theory and practice have to be carried out. This stage involves the understanding of the 'sign-signified'; it requires the connection between the representation and its meaning in the real world. This step requires teachers and students to perform the tasks below.

The teacher is expected to set mapping tasks between forms of representation and events/systems; He/she has to link forms of representation to student's view.

Student must base on gained knowledge to interpret the forms of representation as events/systems and also relate events/system in terms of forms of representation.

Activities related to interpreting forms of representation in virtual learning may require more sophisticated course materials. Students need to see or experience practical side of theoretical presentation. For example, chemistry students need experiment sessions to understand some chemical formulas.

In E-learning, where students and teachers do not meet physically, these practical activities can be shared through videos, simulations, computer based tutorials and

5 Mathemagenic activities are defined by Laurillard (2008) as activities that will result in learning if carried out by learner.

other similar tools.VLE which does not provide tools to build those kinds of materials should allow the upload and view of files created with stand alone softwares.
The design of such material requires not only the understanding of the course being taught but also technical skills in terms of multimedia. On the students' side, the Internet access must be fast and reliable for a proper view or download of files. For some courses, written examples can assist in setting the mapping between the abstract representation and the practical examples in the real world.

c. Acting on the world of description

Students' practical activities like laboratory practices, demonstrations, field work, seminars, and others of the kind are important in the learning process. These activities help the student to engage with his/her field's world with the teacher's mediation. Students experience the world by applying the acquired knowledge to solve problems, improve situations, explain events, etc. The step is named acting on the world of description because those experiences are mediated and contextualized within the course.
Student undertaking these activities have to develop implications, solve problems, and test hypotheses, to produce descriptions while teacher have to elicit and compare description. Teachers must also provide feedback to students by emphasizing on inconsistencies.

One of the most important criticisms about E-learning is the lack of physical interaction between education stakeholders; this is more complicated when it comes to field work, laboratory practices and demonstrations. To overcome that challenge, some online universities prefer to have facilitators in different places where assist students to conduct practical activities.
In cases where practical works require seminars or oral presentations, the activities can be conducted virtually through online conferencing tools.

d. Using feedback

Making a connection between action and instructive feedback helps learners to adjust action accordingly. Receiving feedback is essential but it becomes helpful in achieving learning goals when they are used by the learners to improve their action on the world. Teachers are required to provide again the description, trigger new descriptions and support action and goal linking process. Students must base on teacher's redescription to make a link between action and goals so that they can produce new actions.

In VLE, feedback is given through electronic communication media as a clarification on misunderstood issues, suggestion for a better performance or any other comment which can help a student improve towards learning goals achievements. These can be comments on submitted work, posts on forum or instant message in chat rooms. The effectiveness of these media is critical to the achievement of teaching and learning goals.

e. Reflecting on goal-action-feedback cycle:

The achievement of learning goals depends on how the learner links between action, feedback and integration. The link between those aspects of learning process is only possible if the learner can reflect on the relationships between them. Students have to use the feedback to adjust their actions with an ultimate purpose of achieving targeted goals. Teachers have responsibility to facilitate the reflection on goal-action-feedback cycle.

For online learning to take place the above activities have to be carried out, electronic media play a great role to facilitate the dialogue between learning stakeholders. The above process have been reflected in the Conversational Framework designed by Laurillard's (2008) and this will help in assessing if / or at what extent electronic tools embedded UNISA's VLE supports the learning and teaching process.

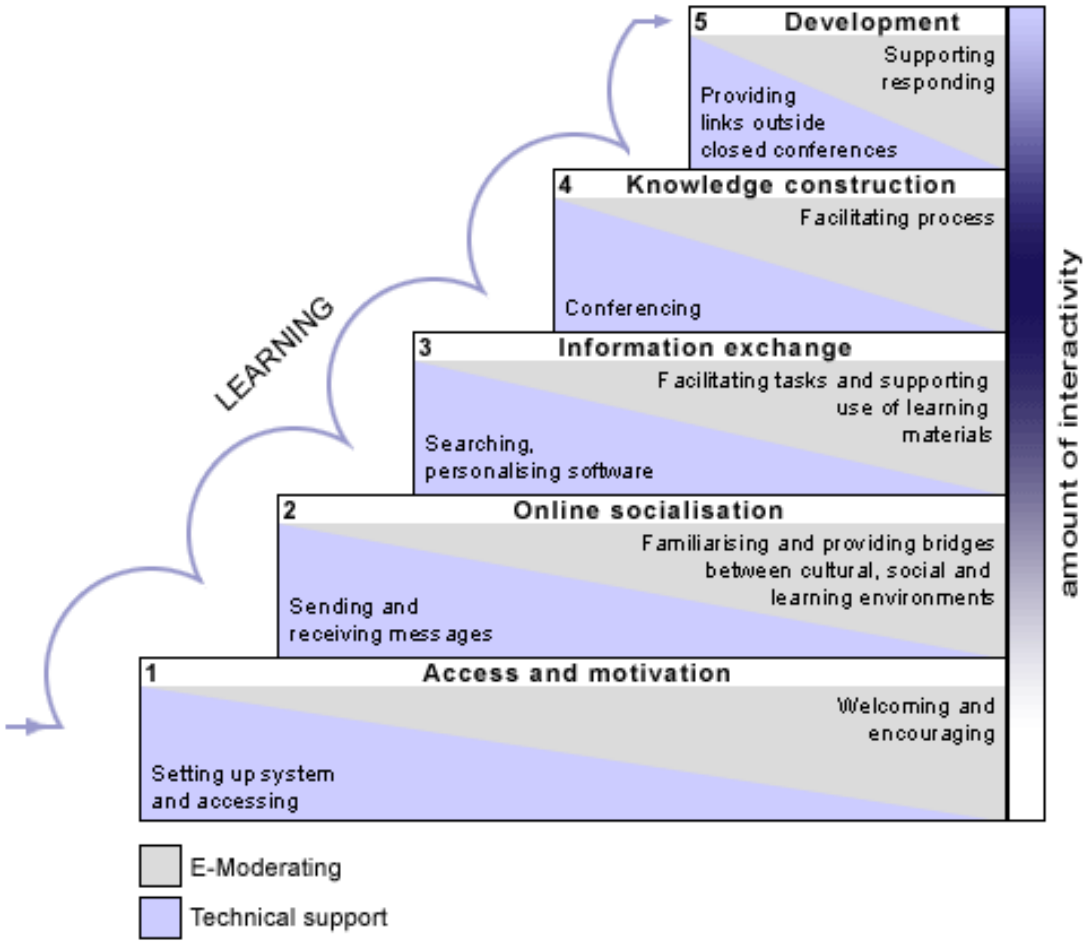
The objectives and aspects of Learning/ teaching process might be valid in both online and face-to-face academic learning. However, the processes towards learning objectives in those two environments are different. The E-learning brings in different media of education delivery which makes the stages to be followed particular as discussed in the following section. To achieve the above objectives a model of learning and teaching in online learning environment has been proposed by Salmon (2003) and has been explained below.

2.4.3 STAGES OF ONLINE LEARNING

Salmon (2003) proposes the model of teaching and learning in online environment which includes the five stages to be followed in order to achieve the objectives stated above. He graphically represents those stages in the figure 3.

Each stage requires participants to acquire certain technical skills (shown in the bottom left of each step). Each stage calls for some online teaching skills (shown on the right top of each step). The 'interactivity bar' running along the right of the flight of steps shows the intensity of interactivity that you can expect between the participants at each stage.

Figure 3 : Model of teaching and Learning online



Source: Salmon (2003). E-moderating : The Key to Teaching and Learning Online.

The learning and teaching process in online environment involves two stages which have to be more considered than it is done in other mode of education delivery. Those stages are access and motivation as well as online socialization. In higher learning institutions, students are familiar with classroom environment and know the basic rules on how to interact with their teachers or their colleagues. In online learning environment, students need to be familiar with the E-learning platform which becomes a new classroom, different to the traditional one.

Thus, classroom dialogue is facilitated by integrated electronic tools and they require some manipulation skills. Access and motivation is a crucial stage in E-learning because as it enables students to access learning material and communicate with the rest of the class.

Below is a demonstration of how the remaining stages (Information exchange, knowledge construction and development) fit in the learning and teaching process as explained by Laurillard (2008). However, these stages are not linear and one stage may continue through the upper stage(s) but with less influence.

Salmon (2003) provides details on what has to be done on each stage and the summary of his explanations is discussed below.

Stage one: Access and motivation

Access and ability to use the online learning platform requires certain computer skills and motivation (Tsui: 2002). At this stage participants need technical assistance on how to access the course content and use the system efficiently. Learners also need to get clarification on what they expect from the online course and what is expected from them. When all participants have posted their first messages, it is time to move to the next stage.

Stage 2: Online socialization

During stage two, participants introduce themselves to each other and start interacting in the virtual environment. This stage aims to get learners accustomed to the new learning environment. The online community of people working together for common tasks develops at this stage. Trust and mutual respect are required to build a productive social environment and achieve common goals (Csikzentmihalyi: 2003).

The first two stages aim the participant's readiness to engage in the overall learning structure. The following stages will be related to the previously discussed aspects of learning process.

Stage 3: Information Exchange

At this stage, learners start interacting with the LMS by engaging with the online course content. Participants begin to exchange course related information to each other and the communication flows freely among them. Up to and including stage three, the interaction intensifies. Participants co-operate in order to support each other towards individual objectives achievement

As learning is centered on dialogue, this stage goes across all aspects of learning activities. However the type of information exchanged differs as participants move to upper stage.

Stage 4: Knowledge construction

Stage four creates a platform for active learning. Through course related discussions, learners address their queries and get clarifications from colleagues or teacher. Basing on their knowledge or course content, they also have the opportunity to support, challenge, and criticize their colleagues' ideas or make their own claim about an issue under discussion. Others contribute by doing the same thing. Through those collaborative discussion learners constructs new knowledge. (Rowntree, 1995) supports the above opinion by saying that:

> "Participants are liable to learn as much from one another as from course material or from the interjections of a tutor. What they learn, of course, is not so much product (eg, information) as process - in particular the creative cognitive process of offering up ideas, having them criticized or expanded on,

and getting the chance to reshape them (or abandon them) in the light of peer discussion. The learning becomes not merely active… but also interactive."

This stage is a continuation of learning activities started in the previous stage and the effectiveness of the current stage considerably depends on how information exchange has previously been done. If participants (teachers and students) have carried out their activities properly, there will be an understanding of course goals as well as of the relation between the forms of representation and events of systems. Thus, I cannot claim that the knowledge construction starts here as the current stage (Knowledge construction) title may mistakenly mean.

At this stage, students start applying the acquired theoretical understanding in solving problems in the real world or producing description and findings. Students, strengthens their knowledge by making sense of it in their daily life.

Another point to be noted is that knowledge construction does not take place at the same time or in the same way for different people. It may start earlier or later depending on the learning pace of students or teaching strategies. In Online learning environment the educational media constitute also a critical dimension on facilitating learning as it have been emphasized along this study.

The information exchange goes across the whole learning process but the form of discussion changes. At the current stage, participants exchange ideas on their applied knowledge. Teachers provide guidance and supervision to students during their practical work and advise them for better performance. The feedback on action does not only come from the teacher but also from classmates.

Stage5: Development

The ultimate purpose for learning is to ensure that student's actions resulting in learning process are significant to the course objectives. Achieving more than expected goals is exceptional but encouraged in higher learning institutions.

At this stage the learning becomes more driven by the learner's personal goals. Participants become more responsible and independent in their online learning process. They develop more skills like "critical thinking and the ability to challenge the given". Learners start challenging the teacher or tutor in different ways namely when the response provided is unsatisfactory to the class. At this stage the constructivism approach is fully applied, As (Biggs, 1995) states "Constructivism calls for participants to explore their own thinking and knowledge building processes" and (Hendry, 1996) adds on that by saying that "personal knowledge includes not only ideas about the topic area under study, but also the teachers' and participants' responses to the experiences of teaching and learning themselves"

Challenge and argument at this stage will foster deeper thinking and reflection.

This level can fairly be compared to the last aspect of the learning process focusing on reflecting on goal-action-feedback cycle. The main similarity about the last stage of this salmon's (2003) online learning model and the Laurillard's last aspect of learning process is the focus on goal-action driven assessment.

All the five stages of online learning process involve the interaction between learners, teachers and at some extent their environment. The communication between teacher and learner in learning process is facilitated by different means known under the name of educational media. The current study is interested on answering the questions related to the role of educational media to facilitate an effective online learning. The aim of this research project arose from two concerns. The first is related to the requirements for effective online learning environment. Critical factors, objectives and aspects for/of effective online learning environment as well as the model of learning and teaching in online environment have been discussed in attempting to shed the light on the first concern. The second concern related to the previous one is to find out how the media grouped under the E-learning platform

helps E-learning stakeholders to achieve the learning objectives in an online learning environment. Assessing those media in terms of pedagogical principles will lead to useful findings and help to draw a conclusion accordingly. The following section of the research summarizes relevant ideas written on assessment of online learning environment from a pedagogical perspective.

2.5 ASSESSMENT OF ONLINE LEARNING ENVIRONMENTS

Assessment has to be guided by criteria which will help the assessors to make judgments. The current assessment will consist on evaluating the local UNISA's VLE in terms of supporting the learning process of students based in Rwanda. The assessment criteria are twelve activities necessary to complete the learning process identified in the Laurillard's (2008) Conversational Framework developed by Laurillard (2008). VLE electronic tools will be evaluated in terms of their abilities in facilitating the learning process in UNISA's local VLE.

Britain & Liber (1999) state that most of VLE evaluation were conducted on basis of functionalities that the system (set of those interconnected tools) provides, technical specifications and the acquisition price. Such evaluations stress on robustness of the system, and how sophisticated tools were and the cost. Those evaluations are important for both client (educators) and supplier (the E-learning platforms developer) because they help in improving the existing tools or in informing which tools to add for more efficiency. However, I agree with Britain & Liber (1999) who state that *"…additional pedagogic criteria are required in order to differentiate VLEs with respect to their use in different teaching and learning situations"*. A pedagogic perspective in evaluating VLEs deserves serious attention as the ultimate purpose of integrating ICT in education is to improve access , quality and flexibility to/of learning (Bates: 1997).

Ozkan, Koseler & Baykal (2009) states that the E-learning systems involve different disciplines such as computer science, information systems, Psychology, education and educational technology. Some researchers tend to evaluate VLE on basis of other factors than pedagogical ones. However, the assessment of VLE tools should be designed on basis of pedagogical principles along with other critical dimension for E-learning effectiveness. These, because the purpose of VLE is to deliver online

Ozkan, Koseler & Baykal (2009) developed a comprehensive E-learning assessment model basing on the existing literature, incorporating concepts from E-learning systems and education disciplines. HELAM (Hexagonal E-learning assessment model) is the name given to that multidimensional evaluation model. The figure 4 illustrates the component of HELAM

Fig. 1. HELAM (hexagonal e-learning assessment model).

Figure 4 : HELAM (Hexagonal E-learning Assessment Model)
Source : Ozkan, Koseler & Baykal (2009)

The main strength of HELAM is that it considers the three main critical factors (the pedagogical, technical and management) for effective online learning. HELAM emphasizes on pedagogical issues under social issues. It considers learner perspective, instructor attitudes and supportive factors which can serve as pedagogical criteria while assessing VLE's tools. It also considers technical issues which help to assess the robustness and reliability of the system. HELAM do not consider management issues as a separate entity but managerial dimension within technical or social issues.

HELAM is convenient for the assessment of the whole online learning institution but not for a local or a sub environment of an E-learning institution. The current study focuses on a specific local environment and emphasizes on learning and teaching context. The present study assesses the VLE in terms of its capability to facilitate necessary activities in the learning and teaching process.

The Conversational Framework designed by Laurillard (2008) is an appropriate tool for the assessment for learning and teaching context in institutional local environment. The framework explains necessary activities that need to be accomplished by students and teachers for learning to occur. Those activities can serve as assessment criteria as it will be explained further. As it will be demonstrated later, the Conversational Framework considers both pedagogical and technological factors. Though the management factor is one of the critical factors for successful E-learning, it is not reflected in the assessment because it goes beyond the scope of the study. It goes on the institutional level while this study is limited to the local learning environment between the teacher and student.

The Conversational Framework developed by Laurillard (2008) evaluates the extent to which various media support the learning process. As it will be expansively discussed further, the Conversational Framework is constructed on basis of the following requirements for any learning/teaching situations:

"

- The teaching must operate as an iterative dialogue;
- Which must be discursive, adaptative , interactive, and reflective;
- And which must operate at the level of description of the topic;
- And at the level of action within related tasks. "

The table below establishes the relationship of media type to the Conversational Framework process.

Table 2 : The relationship of media type to the Conversational Framework process.

Media type	Processes in Conversational Framework
Discursive	P1, P2
	P6
	P2, P3, P10
Adaptive	P3, P4, P5, P12
Interactive	P7, P9
	P8
Reflective	P11

Source: adapted from Bostock J.S. (1996). A critical review of Laurillard's classification of educational media

Similar to Laurillard's position, Britain & Liber (1999) state that:

> "The crucial point from the perspective of the Conversational Framework is that the teacher should be able to construct the learning activity following a conversation with the student from the level of conceptions and the identification of a learning goal for the topic in question. Thus for any given learning environment we should consider how well tools provide for both structuring conversations and actions and also how well they allow for integrating dialogue with actions. "

I support the above statement as it emphasizes on critical activities in learning process and that technological tools should be valued on basis of their contribution to the learning goals achievement. Laurillard's (2008) Conversational Framework is relevant for evaluation of VLEs contribution in the learning and teaching processes. It takes into consideration the teacher-student dialogue from the level of learning goals conception to the level of reflecting on goal-action-feedback cycle. It will help in generating a clear understanding on how electronic tools used in UNISA's VLE support the educational delivery to students based in Rwanda.

2.6 SUMMARY

The literature was reviewed into three parts: Explanation of concepts related to E-learning, the effectiveness of E-learning and assessment of VLE. The E-learning concept was defined along with its advantages and drawbacks. I argued that advantages of E-learning outweigh the drawbacks but under certain conditions. It entails the idea that there is a need to clarify the requirements that have to be met for E-learning to be effective. The exploration of requirements of effective E-learning relates to the first research question and its sub questions. The documentary analysis revealed that E-learning is effective only if it achieves the learning and teaching goals in an online environment. Thus, the E-learning effectiveness has to be measured on basis of its capability to facilitate the learning and teaching process. It is in the same perspective that the second research question, "Does E-learning platform used by UNISA support students in meeting requirements for effective online learning?" , was posed.

Although it was found that the assessment of E-learning has to be guided by teaching and learning objectives, the literature review revealed that a number of VLE assessments have been conducted only on basis of technological robustness or less importance were given to pedagogical aspect. The Conversational Framework that will be discussed in the following definition has been found relevant in answering the two research questions.

CHAPTER THREE: THEORETICAL FRAMEWORK

3.1 INTRODUCTION

This chapter contains the main theories that will guide this research. The Conversational Framework developed by Laurillard (2008) is described. The Conversational Framework contains necessary activities in learning process which will serve as evaluation criteria in this study. The instructional evaluation program is also explained as its principles were considered important for this research.

3.2 CONVERSATIONAL FRAMEWORK

The research applied the Conversational Framework theory developed by Laurillard (2008) to assess the Virtual Learning Environment (electronic media) used by the UNISA as a means of delivering tertiary education to developing countries (as well as in the rest of the world).

The Laurillard's Conversational Framework used in this study originates from conversation theory developed by Gordon Pask (1976 cited in Laurillard: 2008) and the Socratic Method of philosophical enquiry emphasizing on the power of dialogue.

Laurillard (2008) agrees with the epistemology which situates learning as a relationship between learner and the world with teacher as a mediator. Based on that, Laurillard states that teaching and learning strategy could be refined into a set of requirements that apply to any learning situation:

a. It must operate as an iterative dialogue, meaning that the achievement of learning goals requires a repetitive conversation between student and teacher. The idea of linking learning with dialogue dates back from the Ancient Greek with Socrates and

has been previously supported by other education researcher like Pask (1976) cited in Laurillard (2008) who referred to learning as a conversation in his conversation theory (1976) cited in Laurillard (2008). Kolb (1984) cited in Laurillard (2008) also stated that "learning occurs through an iterative cycle of experience followed by feedback, which is reflected on, and used to revise the action". Furthermore, Ramsden (1992) also cited in Laurillard (2008) argued that teaching is sort of conversation. All the above authors emphasized on the importance of interaction between learner and teacher during teaching and learning process. They consider the inetraction as a requirement for this process to achieve its goals.

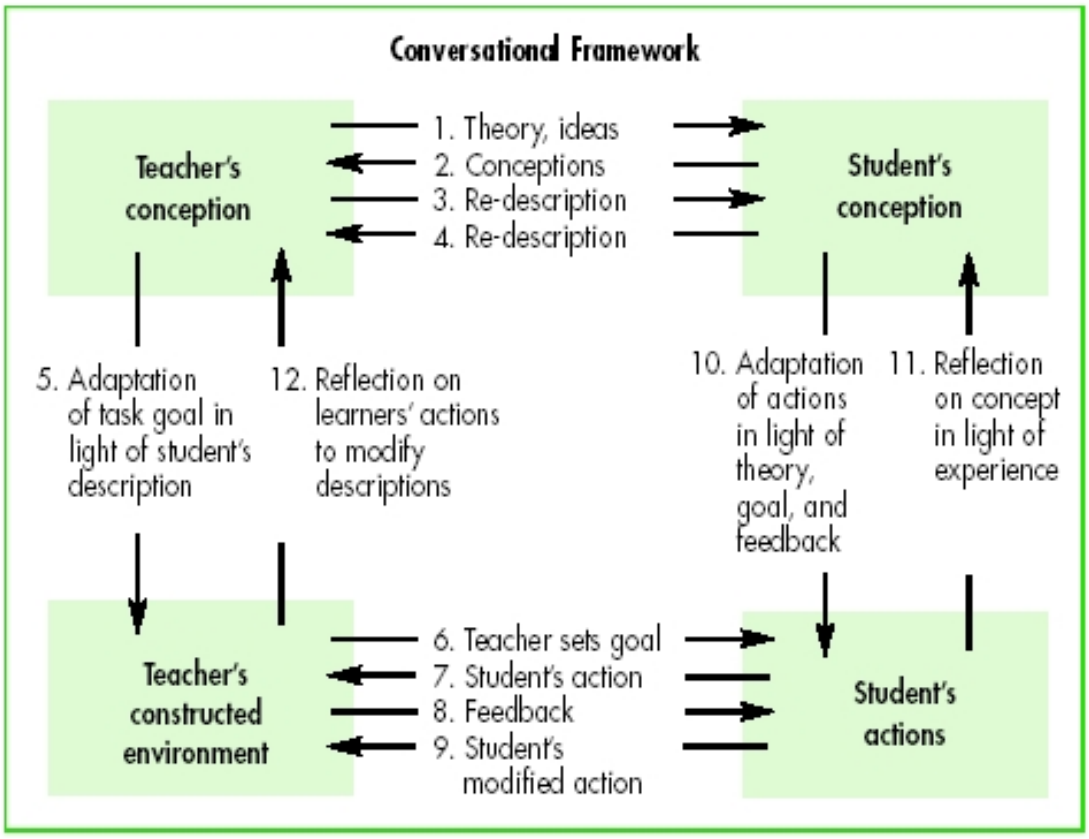
b. Must be discursive, adaptive, interactive and reflective: This is described by Laurillard (2008) as interpersonal and internal dialogue forms, and the following main characteristics of conversational model are required for a better academic learning.

- **Discursive** process involves teachers and students interaction at the level of description of learning topic goals, it is suggested that during the process the teacher has to be aware of the student's conception and vice versa so that the topic goals may easily be negociated
- **Adaptative:** in the light of the topic goals, student and teacher adapt their actions at the level of the task to meet the learning goals.
- **Interactive**, Students perform actions within a set up task environments to achieve task goals. They receive feedback and may readjust their actions to make meaningful change in their task environment.
- **A reflective process is** represented as a set of activities where both the student and teacher where each of them redescribes his/her conception at the level of topic goals description as a result of previous interactions.

As it can be observed from the above key characteristics of conversational model, the teacher / student dialogue must occur from the description of course goals level and continues along with the whole learning process.

In brief, the above requirements make up the framework against which one can evaluate the extent of the use of media to support dialogue of learning. Considering its emphasis on dialogue Laurillard (2008) termed it '*Conversational Framework'*. This Conversational Framework can graphically be represented as follows:

Figure 5 : Conversational Framework



Source : http://ausweb.scu.edu.au/aw03/papers/quinn/framework.jpg

For the purpose of this research, I have adapted the Laurillard's (2008) explanations in the following way:

1 Teacher can describe conception;

2 Student can describe conception;

3 Teacher can redescribe in light of Student's conception or action;

4 Student can redescribe in light of Teacher's redescription or student's action;

5 Teacher can adapt task goal in light of Student's description or action;
6 Teacher can set goals;
7 Student can act to achieve task goal;
8 Teacher can set up world to give intrinsic feedback on actions;
9 Student can modify action in light of feedback on action;
10 Student can adapt actions in light of teacher's description or Student's redescription;
11 Student can reflect on interaction to modify redescription; and
12 Teacher can reflect on student's action to modify redescription.

The twelve points constituted the template of research instruments. This is the evaluation criteria that guided the research questionnaire design and data analysis. As discussed in the literature review, the VLEs assessment guided by critical activities in learning process is the appropriate way to find out how electronic tools (VLE educational media) facilitates the achievement of online learning goals.

The Conversational Framework is the principal theory which guided this research. It helped in answering the first research questions by clarifying the necessary learning activities. The same activities were also used as assessment criteria while answering to the second research question.

3.3 INSTRUCTIONAL PROGRAM EVALUATION

Knapper (1980) explains that Instructional Program Evaluation aims at the assessment of what is happening in a specific instructional program and explains why it happens. Instructional Program Evaluation attempts to answer to the questions of how the program has been implemented

The principal and obvious question while conducting a program evaluation consists of knowing the reason behind the evaluation exercise. Worthern and Sanders (1987) stated that onsite evaluation is conducted either as formative or summative evaluation. He states that the purpose of formative evaluation is to provide evaluative information to improve the program while summative evaluation leads to decisions concerning continuation, termination, expansion, adoption and so on. Considering the objectives of this study, the current research constitutes a formative evaluation.

The current study will focus on one of UNISA's virtual learning environment (Environment of Online students staying in Rwanda), thus it will adopt the case study method as it will be explained in the research methodology chapter.

3.4 SUMMARY

This chapter focuses on the conceptual framework of the study. It explains the Laulliard's (2008) Conversational Framework which summarizes the necessary learning activities. Those activities are used as evaluation criteria for the current local UNISA's VLE assessment. The chapter three demonstrates that the instructional program evaluation along with the Conversational Framework is a useful guideline for this study. It is argued that instructional program evaluation attempts to find answers to the question related on if or how educational programs achieve targeted learning goals. The evaluation criteria influenced the research design.

CHAPTER FOUR: RESEARCH METHODOLOGY

4.1 INTRODUCTION

Based on the research questions, this chapter will focus on the general methodological orientation of the current study. The research design, research participants and sampling, methods of data collection and the research analysis applied in this study will be discussed. This chapter also includes discussion of the limitations, trustworthiness and ethical issues.

4.2 RESEARCH DESIGN

McMillan & Schumacher (2006) define research design as a set of procedures followed to determine research subjects, sites and data collection methods that will help to answer the research questions. The research design provides guidelines on how to get findings and evidences that will be used to answer the research question. The current research is a case study and utilized a qualitative research design. In case study design, as stated by McMillan & Schumacher (2006), the focus is on one phenomenon selected by the researcher with the purpose to understand it in depth regardless of the number of sites for the study. This research focused on a local UNISA's online learning environment, selected as the case study, based in Rwanda at Kigali Institute of Education (KIE). This research aims the analysis and understanding of actions, thoughts and perception of a group of students about their online learning environment; this explains the qualitative status of the current research.

This section focuses on the research participants, site and data collection methods. Each of these is discussed in the following sections

4.2.1 RESEARCH SITE, PARTICIPANTS AND SAMPLING

The research case study is a local UNISA's online learning environment based in Kigali Institute of Education (KIE), one of the Rwandan public higher learning institutions. KIE serves as a mediation center between UNISA and online learning students based in Rwanda. KIE facilitates the registration and access to learning materials. KIE also assists in students' assessment processes and responds to students' learning related queries.

The participants in this study are online students based in Rwanda undertaking studies through KIE. All UNISA's online students undertaking studies through Kigali Institute of Education located in Rwanda were eligible for participation in this. However, I was recommended by the UNISA representative in Rwanda to consider the most active students for their ability to describe the environment. The explanation given was that some students were registered but their level of participation in learning activities like exams were very low. The UNISA representative helped me to compile a list of most active students. At the time of data collection (November-December 2010), the number of active UNISA online students registered through UNISA was twenty.
Twenty from which ten students were randomly chosen. The names of participants were removed to protect their privacy and identity.

As stated by McMillan & Schumacher (2006), the sample size is related to the purpose, research questions, data collection strategy and the availability of information. According to the purpose and nature of the study, a sample size of ten students has been found adequate. The selected students were asked to describe how online learning environment media supports their learning in general and interaction with teachers in particular.

The ten students were given questionnaires and have been asked to bring them back to me after filling in required information. Nine of them returned the questionnaire. One of the students was constantly reminded to complete the questionnaire and promised to do so but ended up ignoring reminders (emails and calls) and was subsequently excluded from the study.

4.2.2 METHODS OF DATA COLLECTION

Vithal & Jansen (2002) state that the purpose of a data collection plan is to give details about the strategy that will be used to get desired information.
Based on current research questions, questionnaires and documentary analysis were used.

4.4.2.1 DOCUMENTARY ANALYSIS

Documentary analysis is data collection method that has been used in this research to find out the requirements for effective online academic learning. It was used to explore UNISA's virtual learning environment in terms of the Conversational Framework. Documentary analysis was helpful in understanding the structure of online learning environment (specifically the VLE used by UNISA), the requirements for effective and different VLE assessment frameworks. This method mainly helped in answering the first research question and provided guidelines to develop the questionnaire used in this research

4.2.2.2 QUESTIONNAIRE

A questionnaire has been used in order to collect necessary data to answer the second question related to use of UNISA's VLE by online students based in Rwanda towards

the achievement of effective online learning. Data collected from the questionnaire to determine whether the E-learning platform (a set of educational media) used by UNISA has been helpful in meeting requirements for an effective online learning. The questionnaire design was guided by research questions, the assessment criteria and previously used questionnaire in the same field. The questionnaires distributed to students were designed to understand how and what students used to carry out their academic duties and their interaction with their teachers in a virtual environment.

The assessment criteria considered for this study were the twelve essential activities within the workflow of Conversational Framework (Laurillard: 2008). The questionnaire was also adapted from *E-learning check list* developed by Khan (2005) and questionnaire used by Britain, S. & Liber, (2004) in *a framework for the pedagogical evaluation of E-learning environment.*

The following table illustrates the connection between the second research question, criteria (criteria delivered from literature review), and the questionnaire (see appendix1)

Table 3 : the connection between the research questions, criteria, and the questionnaire

2nd RESEARCH QUESTION	CRITERIA	RELATED QUESTIONS
Does E-learning platform used by UNISA support in meeting requirements for effective online learning?	1 T to describe conception;	1,2,19
	2 S to describe conception;	6,7,8
	3 T to redescribe in light of S's conception or action;	2,3,9,10
	4 S to redescribe in light of T's redescription or S's action;	7,8,9,21
	5 T to adapt task goal in light of S's description or action;	9,10,2,3
	6 T to set goals;	2,3,11,12,21
	7 S to act to achieve task goal;	14,17,22
	8 T to set up world to give intrinsic feedback on actions;	13,14,15,16,23,24
	9 S to modify action in light of feedback on action;	16,17,21,24,22
	10 S to adapt actions in light of teacher's description or Student's redescription;	14, 21,22,232,24
	11 S to reflect on interaction to modify redescription; and	14,21,23,24
	12 T to reflect on student's action to modify redescription.	15

Source: Own drawing

In addition to questions specified above, questions 4, 5, 18, 19 and 25 have been included in the questionnaire to provide the general understanding of the whole online learning environment.

4.3 DATA ANALYSIS

McMillan & Schumacher (2006) define qualitative data analysis, which has been used for the current research, as 'systematic *process of coding, categorizing, and interpreting data to provide explanations of a single phenomenon of interest'.* Data collected were analyzed in order to get information which provided answers to the research questions. Figure 6 shows the followed procedure:

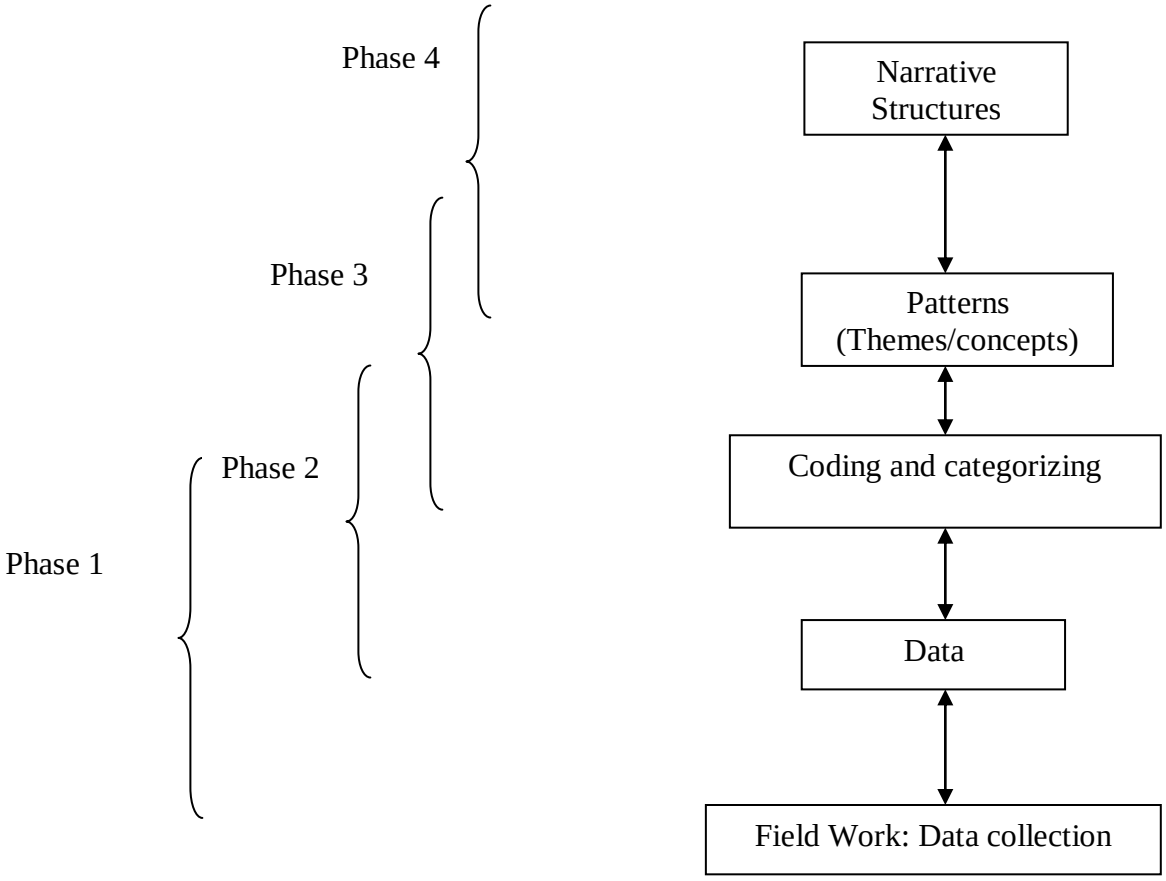


Figure 6 : General process if Inductive Data Analysis
Source: Adapted from Research in education: evidence based inquiry McMillan & Schumacher (2006), P.365

The research findings, related discussion and answers to the research questions were based on data collected through mentioned methods.
The presentation and discussion of findings were guided by two themes similar to the main research questions.

The first theme is about the requirement for effective E-learning and the second concerns the assessment on the use of tools embedded in local UNISA's VLE against the Conversational Framework. Findings and discussion related to the first theme derived from documentary analysis.
The categorization of data was guided by the Laurillard's Conversational Framework. Guided by table 3, responses from students were organized under twelve activities of the Conversational Framework. The presentation and discussion of findings were presented in narrative form.
The current study, like other academic research studies, strived to understand (Adendorf: 2004) the data and answering the research questions. To ensure that the findings reflect the real situation, a set of strategies to enhance validity needs to be determined and used during research process.
McMillan & Schumacher (2006) proposed ten possible strategies to enhance validity in qualitative researches. Two of them have been selected to be used during this research. Basing on explanations from McMillan & Schumacher (2006), the choice of each strategy is justified below.

Low inference descriptors: In E-learning field there are different technical terms used and which may be confusing to non practitioner. Low interference descriptors constitute a strategy which emphasize on the use of understandable language while collecting data. This strategy has been selected and applied to ensure that the language used is not unclear to respondents and readers.
Member checking consist of informal conversations with research participants to understand more about their realities. For this research the strategy helped to

understand respondent's idea expressed vaguely on questionnaires. These were done through telephone conversation.

4.4 ETHICAL ISSUES

When a study involves human beings, McMillan & Schumacher (2006) state that the researcher has the ethical responsibility to protect the research participants from physical and mental discomfort, harm and danger. Before starting the data collection, I applied for the ethics clearance and received approval, protocol number: 2010ECE08C (see appendix C), from School of Education Ethics Committee of the University of the Witwatersrand.

The current study took into consideration the ethical issues. I collected the consent forms signed by the respondents before collection of data. Respondents were assured that the data collected from the questionnaires would be held confidential and only used for research purposes. The anonymity of respondents was guaranteed and they were allowed to withdraw from the study at any time without any adverse consequences. Respondents could find out about the research findings when the study is completed.

4.5 LIMITATIONS OF THE RESEARCH

This study will be limited to UNISA online students staying in Rwanda and thus result cannot be reliably generalized to the entire UNISA campus.

4.7 SUMMARY

Chapter four provides detail on research design. The research site is described and the sampling of respondents was justified. Details on data collection methods are provided and analysis procedure was explained. This chapter includes discussion on validity, ethical issues and limitations of the research. The findings will be discussed in the following discuss chapter.

CHAPTER FIVE : PRESENTATION OF FINDINGS

5.1 INTRODUCTION

The research findings are presented and discussed under two themes namely requirements for effective online academic learning and the assessment of the local UNISA's VLE (used by online learners based in Rwanda and their teachers) in terms of Conversational Framework.

5.2 DESCRIPTION OF THE CASE STUDY

UNISA's roots go back over 130 years, which makes it the oldest university in South Africa (UNISA website: 2010). The University of the Cape of Good Hope, which changed its name to the University of South Africa in 1916, was initially an examining body. Before it becomes the pioneer of tertiary distance education in the Western world, UNISA went through numerous structural changes explained on its official website.

For the next five decades or so UNISA steadily built up an international reputation as an affordable, credible, accessible and flexible distance education institution.

In 2004, UNISA in collaboration with Kigali Institute of Education[6] extended its program to Rwanda. Online students were registered by UNISA's representative based in KIE. Courses are offered through a VLE called SAKAI. UNISA in partnership with KIE offers programme that range from certificate to PhD to online students based in Rwanda.

[6] A Rwandan institution of higher education with a mission to produce professionally qualified teachers and other professionals in high quality research environment that promotes community services.

5.3 REQUIREMENT FOR EFFECTIVE ONLINE ACADEMIC LEARNING

This theme arose from findings related to the first research question which consists on determining what the requirements for the effective online learning are. To shed the light on this theme, documentary analysis was used as the data collection method. The findings related to this theme are presented into two sections relating the sub questions to the main research question. The first section presents the online learning objectives which have to be achieved for E-learning to be effective. The second section emphasizes the critical factors to achieve those objectives. The integration of the critical factors towards goals achievement is also discussed in this section.

5.3.1 ONLINE LEARNING OBJECTIVES

The main objective of online learning is to deliver learning in a virtual learning environment. The achievement of that overall objective involves numerous factors as it has been discussed in the literature review. Pedagogical, technological and managerial has been considered to be the main success factors. For a successful E-learning, it has been found that the pedagogical aspect has definitely to lead other factors. The tendencies in different projects overemphasize on using as much technology as possible and less attention is given on how those technologies contribute to students' learning. The research does not underestimate the role of ICTs in facilitating the achievement of learning goals in a virtual environment. The point is that technology should not be estimated for its robustness and sophistication but rather for how it facilitates the learning and teaching process.

I agree with the following statement made by JISC (2003):

> "E-learning is fundamentally about learning and not about technology. Strategic development of E-learning should be

based on the needs and demands of learners and the quality of their educational experience."

The main aim of online learning is the achievement of learning goals and technologies are tools which facilitate the process.

Although online learning has a different delivery mode from traditional learning, the learning goals for educational institutions remain similar.

Learning may take different form in terms of skills or knowledge to be taught, learning environment, stakeholders involved in the process as well as other factors influencing the learning and teaching process. However, learning aim following objectives:

- *Engage learners in the learning process;*
- *Encourage independent learning skills;*
- *Develop learners' skills and knowledge; and*
- *Motivate further learning.'*

The analyzed literature revealed that the awareness of learning objectives is a starting point and should be considered in the conception, design, development as well as evaluation of any educational institution. Bearing in mind the four objectives mentioned above contributes to the development of pedagogical driven online learning systems. The use of tools integrated in VLE systems should always be guided by the learning objectives.

During the courseware (online course) design, teachers must use the tools mainly to facilitate the achievement of the learning goals stated above. On the other hand, students should use the tools to facilitate their learning.

The learning objectives stated above are part of the answer to the first research question mentioned earlier and I agree with other authors who claim that learning

objectives should guide all undertaken activities for successful E-learning program. Another part of the answer to the research question is derived from an analysis of factors influencing the achievement of the online learning objectives. The pedagogical factor which is considered as the most important to achieve the online learning objectives has to be integrated with other factors as discussed below.

5.3.2 CRITICAL SUCCESS FACTORS

Critical factors for E-learning success are the most important factors that affect the achievement of online learning goals. After the analysis of relevant documents, I found that it is very difficult for E-learning to be successful if those factors are ignored. Different authors have suggested various factors (Masoumi: 2006) as shown in the literature review. After examining different suggested factors and their meanings, I have regrouped the factors into three main categories. Pedagogical, technological and managerial factors which are interrelated and mutually dependent. The institution starting E-learning program will have to consider jointly the technological equipments which will facilitate the achievement of pedagogical goals of the institution. The coordination of activities and VLE administration explain the consideration of management as one of the critical factors for E-learning success.

Through documentary analysis, I have summarized what has to be carefully considered in each of the three main critical factors mentioned above.

5.3.2.1 PEDAGOGICAL FACTOR

The pedagogical factor considers all aspects that can influence teaching and learning process in face-to-face or online environment. In online learning environment, influencing aspects can be summarized into four sub factors namely aspects of

learning process, Instructional design, medium analysis and assessment. The four subcategories are explained in the following sections.

5.3.2.1.1 ASPECTS OF LEARNING PROCESS

The knowledge of cognitive activities in a local higher learning environment necessary for learning to take place is helpful for VLE assessment exercise. These activities have to be carried out by learning stakeholders to construct new knowledge. An adequate VLE should provide tools and possibilities to carry those necessary activities summarized by Laurillard's (2008) into five aspects:

- Apprehending structure
- Interpreting the forms of representation
- Act on descriptions of the World
- Use feedback
- Reflect on goals

The activities described above can serve as VLE assessment criteria, However these activities were found too broad and were not helpful while assessing each VLE against its pedagogical use. For the assessment criteria, I have considered the Conversational Framework developed by Laurillard (2008). The Conversational Framework provides a list of detailed and chronologically ordered activities necessary to complete learning process

5.3.2.1.2 INSTRUCTIONAL DESIGN

Through the documentary analysis, I have found that the instructional design for online learning courses considerably influences the quality of learning. No matter

how robust an online learning system can be, the quality of online learning will mainly depend on the instructional design.

I agree with the earlier quoted authors, Bonk and Reynolds (1997) who argues that

" to promote higher order thinking on the Web, online learning must create challenging activities that enable learners to link new information to old, acquire meaningful knowledge, and use their metacognitive abilities; hence, it is the instructional strategy and not the technology that influences the quality of learning."

The ability of teachers to design activities that will trigger the learners' knowledge construction is paramount for E-learning success. Teachers should be able to design course content which will take their students through the five activities described in the previous section (5.3.2.1.1). The design of the efficient learning activities in a virtual environment requires adequate instructional media. For a successful online learning program the media should be able to serve educational purpose. The next section focuses on adequate online instructional media.

5.3.2.1.3 MEDIA ANALYSIS

Online education is delivered through technology based tools integrated into VLE. Those tools which facilitate learning stakeholders' interactions are referred to as educational media. For a well informed assessment of VLE, I explored the literature to find out the characteristics of adequate technology based media to facilitate the learning process. An example of standard VLE were described in the literature review (Figure 1).

Laurillard developed a classification of educational media in consideration of their pedagogical use. Media was classified into four categories in terms of "the extent to which they support the interpersonal and internal dialogue forms during learning processes".

Media were classified as : Discursive, Adaptative, Interactive and Reflective.

As shown previously, the table below establishes the relationship of media type to the Conversational Framework process.

Media type	Processes in Conversational Framework
Discursive	P1, P2
	P6
	P2, P3, P10
Adaptive	P3, P4, P5, P12
Interactive	P7, P9
	P8
Reflective	P11

Source: Bostock J.S. (1996). A critical review of Laurillard's classification of educational media

The relationship of media classification and conversation framework links the media to the activities which lead towards the achievement of learning and teaching goals.
I agree with Moore and kearsley (1996) who argue that "the instructional media need to fit with the course objectives and activities, the students, the learning environment, economic or organizational factors and feasibility".

5.3.2.1.4 ASSESSMENT OF ONLINE LEARNING ENVIRONMENT

The assessment of online learning aims the gathering of information related to critical success factors in the E-learning environment and use the information with the purpose of improving E-learning practice. The assessment contributes in the improvement of E-learning through its ability to expose the strengths, weaknesses, opportunities and threats of the environment. Moreover, the assessment exercise

suggests actions and measures to be taken for improvement. The assessment of online learning can be conducted on basis of three critical factors that can influence the online learning outcomes. The assessment can be done from a pedagogical, technological, managerial perspective. Some researchers, mentioned in the literature review, suggested that a multidimensional assessment (considering more than one critical factor) may be more appropriate. I do agree that an assessment that incorporates the main factors affecting the online success gives a more holistic image of the learning environment. However, the multidimensional assessments (Like HELAM, mentioned in the literature) are more appropriate for the assessment of the whole institution and may not be suitable for a local or a sub environment of an E-learning institution. Through documentary analysis, it has been found that the assessment of specific local environment should take into consideration the context and the scope of the assessment. The current study focuses on a specific UNISA's local environment and emphasizes on learning and teaching context. The current assessment is guided by the Conversational Framework proposed by Laurillard (2008). It suggests an assessment of Virtual learning environment on basis of necessary activities for learning to take place. The assessment based on the Laurillard's Conversational Framework is a pedagogical assessment but it indirectly considers other critical factors. The VLE assessment guided by Laurillard's Conversational Framework will evaluate the potentiality of technology in facilitating the learning and teaching process. It implies that technological factors are considered in relation to pedagogical ones.

The learning and teaching process involves also the classroom management. Though the management factor is one of the critical factors for successful E-learning, it is not reflected in the assessment because it goes beyond the scope of the study. It goes on the institutional level while this study is limited to the local learning environment.

The assessment of VLEs is a crucial exercise as it provides vital information for online learning improvement. The fact that online learning improvement should be measured in terms of the achievement of learning goals implies that VLE assessment

should be pedagogically driven. However, the assessment of VLE cannot be meaningful without considering the technology which supports all learning activities.

5.3.2.2 TECHNOLOGICAL FACTOR

Without the use of ICT, the word E-learning will have a different meaning rather than one given in the literature review of this study. Technology enables the establishment of a virtual environment. The purpose of its use is to facilitate the efficient educational delivery in online environment. Hardware, software and Technical skills are the sub factors considered under technological factor.

5.3.2.2.1 HARDWARE

Hardware is a generic term used for the physical equipments of Information and Communication Technology. Hardware will be used to indicate the physical infrastructure which may be used to facilitate the interaction between E-learning stakeholders. Hardware includes computers, sound, connectivity and other multimedia devices that can be used by either the teacher or students during the learning and teaching process. Access to the computers and Internet by E-learning stakeholders is a requirement for any virtual learning program. Other peripheral devices are also important depending on how they serve the online education delivery. However, the physical equipments will be useless if there are no appropriate software and knowledgeable staff who will be able to ensure the smooth use of the available equipments.

5.3.2.2.2 SOFTWARE

Software is a technical term used in the field of ICT and refers to the programs or other "instructions" that a computer needs to perform specific tasks. LMS or VLE are systems which integrate different softwares to create a platform for online learning. Each software performs a specific task but within a single system. For an effective E-learning, VLE has to be selected on basis of its capability to serve education purposes.

The availability of appropriate and reliable technology constitutes a considerable contribution in supporting online education. However there is a need for human intervention to operate the technology and make it useful to online education.

5.3.2.2.3 TECHNICAL SKILLS

ICT Technical skills are required for efficient use of hardware and software. In the context of E-learning, ICT technical skills involve knowledgeable personnel in ICT use for educational purposes. The skilled staff deals with the conception, design, implementation and support in online learning process. These are not the only workforce that E-learning projects need but they play a crucial role in online education. The staff should be composed but not limited to specialists in three fields related to three main success factors emphasized in this section. The team has to be at least composed by ICT specialist(s), instructional designer(s), pedagogue(s) and manager(s). Staff members need to integrate their inputs for optimum outputs. As the success factors are interdependent and interrelated, so is the members' job.

The awareness and consideration of online learning objective in the teaching and learning process is necessary but not the only requirement for the effective E-learning. There are also a number of factors affecting the effective online learning

that need to be observed in the process of design and development of online learning program. Those are mainly pedagogical, technological and managerial factors. Though pedagogical factor is the most important, it has to be considered along with others in order to achieve the online learning objectives.

5.4 ASSESSMENT OF THE LOCAL UNISA'S VLE IN TERMS OF CONVERSATIONAL FRAMEWORK

The assessment of local UNISA's VLE in terms of Conversational Framework is the theme derived from the second research question mentioned earlier. The findings related to this theme have been presented under two categories.

The first category of findings summarizes information retrieved from published documents relevant to the exercise. Information about LMS or VLE used by UNISA (SAKAI) was useful to answer the first sub question of the second main research question. In that regard, documentary analysis facilitated the identification of educational tools available on the VLE used by UNISA (SAKAI). On the SAKAI official website (2009), tools were listed in four groups (general collaboration, teaching and learning, administrative and portofolio tools). I reorganized them on basis of the Conversational Framework developed by Laurillard's. The aim was to group the VLE components according on their contribution in the learning process.

The second category consists of findings from data collected through the questionnaires filled by UNISA's online students based in Rwanda. These findings were mainly related to the last three sub questions of the second main question. The findings were based on SAKAI tools used by the UNISA's students and teachers, how and at what extent those tools are utilized in order to carry out necessary activities for online learning to occur.

Thus the findings have been grouped into two sections: Assessment of SAKAI in terms of Conversational Framework and Assessment of UNISA's VLE in learning process of students based in Rwanda.

5.4.1 ASSESSMENT OF SAKAI IN TERMS OF CONVERSATIONAL FRAMEWORK

UNISA deliver online education through one of the leading open source VLE called SAKAI. SAKAI system is composed by different tools designed to support online learning process. On SAKAI website, tools are grouped into four main categories which are general collaboration, teaching and learning, portfolio and administrative tools. For the purpose of this study, SAKAI tools have been confronted to the twelve necessary learning activities proposed by Laurillard (2008). This will help to provide useful information on the educational media available on VLE used by UNISA and its capabilities in supporting online learning process.

1. SAKAI tools which can help teachers to describe conception;

To facilitate this activity, SAKAI provides syllabus, resources and lesson builder as teaching and learning tools. It also provides tools to facilitate collaboration in the learning process namely wiki, blog, web page, chat, email, discussion forum, and glossary. Portfolio tools are also embedded in SAKAI and can help the teacher to describe the conception.

2. SAKAI tools which can help the Student to describe conception;

Students can describe conception by using the general collaboration and portfolio tools similar to those used by teachers. They can access the syllabus built by the teacher and do not normally have rights to edit it.

3. ***SAKAI tools which can help teachers to redescribe in light of student's conception or action;***

For this activity, teacher can use the same tools as those used in the first activity. However, they have the possibility to use more portfolio tools (layout and style as well as portfolio templates) to make the concept clearer.

4. ***SAKAI tools which can help students to redescribe in light of Teacher's redescription or student's action;***

Students can rediscribe the conception by using the same tools as those used in the second activity.

5. ***SAKAI tools which can help the teacher to adapt task goal in light of Student's description or action;***

For this activity, announcement and news tools can complement tools capable to support the third activity (the teacher's redescription of conception).

6. ***SAKAI tools which can help teachers to set goals;***

The goals setting involves more teaching tools related to the activities which aim to assess student's progress towards targeted goals. SAKAI provides assignments, test and quiz tools to assist the teacher to carry this activity. In addition to that, teachers can use communication and portfolio and other learning and teaching tools suggested for previous teacher's activity.

7. ***SAKAI tools which can help Student to act to achieve task goal;***

Students can use the assignment, dropbox test and quiz tools to submit accomplished tasks to teacher for feedback. They can still use collaboration and portfolio tools suggested for previous students' activity.

8. ***SAKAI tools which can help teachers to set up world to give intrinsic feedback on actions;***

Teacher can give feed back to students by using collaboration tools suggested for previous activities. Assignment, test and quizzes, drop box and grade book are teaching and learning tools provided by SAKAI to support this activity. In addition to portfolio tools suggested for the above activities, the teacher can also use evaluation and reports portfolio tools.

9. ***What are SAKAI tools which can help Student to modify action in light of feedback on action;***

Students can use the same tools as those used while acting to achieve goals (activity 7).

10. ***Student can adapt actions in light of teacher's description or Student's redescription;***

Students can use the same tools as ones suggested for acting to achieve goals (activity 7).

11. ***What are SAKAI tools which can help student to reflect on interaction to modify redescription;***

    Students can use the same tools as ones suggested for acting to achieve goals (activity 7).

12. ***What are SAKAI tools which can help the teacher can reflect on student's action to modify redescription.***

Online can carry out this activity by using the same SAKAI tools that has been found capable to facilitate the activity 5 (the conception redescription by the teacher).

The findings presented in this first category of the section based on existing literature to list different tools available in SAKAI. For the purpose of this study, I organized those tools in terms of their utility in the learning and teaching process. It was found that there is more than one tool to support each of the twelve necessary learning activities summarized in the Conversational Framework.

5.4.2 ASSESSMENT OF UNISA'S VLE IN LEARNING PROCESS OF STUDENTS BASED IN RWANDA.

The assessment of the UNISA's VLE in learning process of students based in Rwanda was conducted on basis of data collected through questionnaires filled by nine online students. The questionnaire was designed with the purpose to find out What VLE educational media are used by UNISA, how and at what extent are those media used to support the learning process of students based in Rwanda. Twelve learning activities (or steps) determined by Laurillard in her Conversational Framework were considered as assessment criteria. The questionnaire comprises twenty four questionnaires; each of them aims to find out if the VLE tools support one or more activities of the Conversational Framework. Information from respondents helped also to understand how tools are used to facilitate the learning and teaching process (refer to the table 3).

The findings related to this section are presented as twelve questions derived from the confrontation of the UNISA's VLE tools used to deliver online education to students based in Rwanda and the Laurillard's Conversational Framework.

1 Does UNISA's VLE allow the teacher to describe conception ?

All respondents confirmed that the course provides details on course goals, learning outcomes, course structure/ overview, assessment criteria, course entry prerequisite. Respondents also stated that guidance on how to organize for E-learning was provided. Collected data revealed that UNISA VLE provides different tools which can be used by teachers to describe conception to students. Tools that are used by the UNISA teachers to describe conception or present learning material in general were webpage, syllabus, email, wiki, forum and chat.

Six out of the nine respondents confirmed that they use Webpage, syllabus, email and forum. This implies that the mentioned tools are the most used to facilitate the conception description and presentation of other learning materials. Only two students out of nine who participated in the research recognize the need to have used chat and wiki tools. It showed that although wiki and chat are used by teachers, students do not participate in communication through these two tools.

2 Does UNISA's VLE allow the student to describe conception;

Teachers used the two way communication tools to describe conception, students also used the same tools to express their ideas about teachers' communication. Basing on collected data it was found that Webpage, syllabus and email are the tools most used by students. Forum was rarely used and chat was not used for this activity. Although students have access to tools which can allow them to express their ideas and understanding on the course; all respondents reported that they did not have the opportunity to negotiate learning goals and evaluation criteria.

3 Does UNISA's VLE allow the teacher can redescribe (the conception) in light of Student's conception or action;

This activity was not performed because students do not have space or are not encouraged to negotiate goals, evaluation criteria or other suggestion related to the

teacher's description of conception. One student responded by simply saying that "Students don't suggest anything".

4 Does UNISA's VLE allow the Student to redescribe (the conception) in light of Teacher's redescription or student's action;

This activity resulted on the exchange of ideas between students and teacher about the description of conception. It merged here that students do not have enough negotiation rights to alter the teacher's description of conception; makes this activity not applicable. However, as shown in the previous chapter, participants have access to tools which may facilitate the accomplishment of the task.

5 Does UNISA's VLE allow the teacher to adapt task goal in light of Student's description or action;

Due to the absence of sufficient discussion on the participants' description of conception, the tasks goals exposed at the beginning of the course did not change. In spite of the availability of tools to support participants at this stage, this activity becomes also not applicable in the learning and teaching process for the current case study.

6 Does UNISA's VLE allow the Teacher to set goals;

It was found that teachers used collaboration tools mentioned above (webpage, syllabus, email, forum, chat and wiki) to inform students on goals set and discuss on how they will be carried out. Assignment and email tools are used to send assignment and exercises to students. These were confirmed by the nine students who filled the questionnaire.

7 ***Does UNISA's VLE allow the student to act in order to achieve task goal;***

The VLE used by UNISA provided a number of tools which can be used to support this activity. However a few of these tools are used in local UNISA's VLE. Respondents said that they carried out the assigned tasks with the use of standalone application like Microsoft Word and submitted to the teacher through email or used drop box tools. Some assignments or exams are sent through post office as hardcopies.

8 Does UNISA's VLE allow the teacher to set up world to give intrinsic feedback on actions;

UNISA teachers send task to students through collaboration tools mainly email or send the hardcopies via post offices. They sometimes upload tasks on VLE through assignment tools. The feedback from teacher to student is given either by email or through assignment tools. Marks are published through grade book tool or sent through post office (if the assignments are submitted on hard copies). As it is shown in the following chapter which discusses the findings, the VLE used by UNISA provide tools which can facilitate this activity but they are not used by participants in the concerned environment.

9 ***Does UNISA's VLE allow the student to modify action in light of feedback on action;***

Students learn also through the feedback from teachers. One Student claimed that they "come to know what was expected and improve". Other eight also expressed that feedback from the teacher helped them to perform better in following assignments. When they have to resubmit their work they use email, drop box or assignments tools.

10 Does UNISA's VLE allow the student to adapt actions in light of teacher's description or Student's redescription;

With more assignments given by the teacher, the UNISA students believed that they would their marks. "The feedback helps in applying theory into real life to sort out practical problems". Said the student. The interaction aiming the link of action and participants' description are channeled by collaboration tools like email, forum, wiki and chat.

11 Does UNISA's VLE allow the student to reflect on interaction to modify redescription

At this level of the learning process, the student thinks deeply on the whole learning content and related discussions in order to have a holistic understanding of the course. Students used the collaboration tools used in previous steps to reflect on interaction between themselves or with their teacher.

12 Does UNISA's VLE allow the teacher to reflect on student's action to modify redescription.

Students don't really have a lot to say on teacher's future action and thinking.
Information collected from students was not really helpful to answer this question.

Findings presented in this category were based on data collected from the case study field. Questionnaires collected from nine UNISA students based in Rwanda helped in finding out the SAKAI tools used by those students to carry out their studies. The information provided by respondents was organized in the way that I could find tools used and how they are used to support each of the activities in the Conversational Framework. It was found that tools available in SAKAI support eight of the twelve necessary activities for effective learning of UNISA students based in Rwanda.

Activities number 3, 4, 5 are not supported, not because SAKAI tools cannot support them but rather because they are not considered in the course design. The activity 12 is not included in the activity supported because I could not find reliable information from students.

For the eight supported activities, I found that six of them (activities number 1, 2, 6, 9, 10, 11) are fully conducted online and use almost all the available tools to support those respective activities. Activities number 7 and 8 are partially carried out online. Some assignments and tests are sent through post office as hardcopies and the feedbacks are sometimes sent via the same way.

Briefly, I found that SAKAI provides enough tools to support all activities necessary for effective online learning of students based in Rwanda. However, those tools are underused or not used at all (portfolio tools, glossary. blog and Announcement) to support the learning and teaching process. The following chapter provides an in-depth discussion of these findings.

5.5 SUMMARY

In this chapter, research findings are presented into two themes related to the two main research questions. The first theme focuses on requirements for effective online academic learning while the second concerns the assessment of the local UNISA's VLE in terms of the Conversational Framework. The findings presented in this chapter derive from data collected through two methods. Data collected from the field and the summary of the literature related to the study. The findings presented in this chapter are discussed in the following chapter.

CHAPTER SIX : DISCUSSION OF FINDINGS

6.1 INTRODUCTION

This chapter discusses the research findings related to the issues raised from the study on the assessment of UNISA's local VLE in terms of Conversational Framework. The findings are discussed under two main themes. The first theme focuses on discussion aiming to answer the first research question. It focuses on findings related to the requirements for effective online learning. The findings are grouped under three dimensions which are pedagogical, technical and managerial. Findings in this section were based on data collected from documentary analysis.

The second section provides a discussion aiming to answer the following research question: *Does the E-learning platform used by UNISA support in meeting requirements for effective online learning?*

The issues related to the above question are discussed into two parts. It starts with the discussion on the capability of the VLE used by UNISA in facilitating the learning activities summarized in Laurillard's Conversational Framework. The discussion in the first part will help to find answers to the following sub question which arose from the mentioned research question.

- What are the educational tools (media) available on UNISA's online platform?

The discussion continues with the assessment of the same VLE against the Conversational Framework but brings in a new factor which is use. The assessment based on data collected through questionnaires. Questionnaires were distributed to online students to find out how the VLE is used to facilitate the learning process. In order to adequately assess how the local UNISA's VLE is used, the study attempts to find answers to these three subquestions:

- What are the educational media used by UNISA?
- How are those media used to help in achieving UNISA's educational goals?
- To what extent do those media help in Conversational Framework?

The chapter concludes by providing a synthesis of findings discussion.

6.2 WHAT ARE THE LEARNING REQUIREMENTS FOR EFFECTIVE ONLINE ACADEMIC LEARNING SITUATION?

The research findings showed that effective online learning is the one which achieves the learning and teaching objectives. It was also revealed that E-learning is function of inter independent and interrelated factors that affect the online learning process. Those factors are prerequisite to the success of online learning and ignoring them or a careless consideration will likely lead to the failure of online learning projects. In the literature review, the factors which can affect positively or negatively the online learning projects have been referred to as critical factors to the effectiveness of online learning. As mentioned in the literature review, researchers suggested different factors to be considered as critical to the effectiveness of online learning. After realizing that it is hard, if not impossible, to make an exhaustive list of factors affecting online learning, I decided to consider three main factors which can include numerous sub factors. As it is discussed in the following sections, online learning is affected by different factors which can be common to all online learning programs or may differ because of different learning environments and situations. However, no matter how common or contextual factors may be, I argue that those factors can be grouped into three groups which are: pedagogical, technological and managerial factors. The three main factors will then include sub factors which can be common or contextual. In depth discussion on the significance of the three factors is provided in following sections.

6.2.1 PEDAGOGICAL FACTORS

I totally agree with the central argument of Laurillard (2008) in her book 'Rethinking University teaching' where she argues that

> "the promises made for E-learning will only be realized if we begin with an understanding of how students learn, and design the use of learning technologies from this standpoint".

E-learning promises are mainly the delivery of high quality, flexible and less expensive education to a more increased number of students through ICT technologies. For E-learning to be successful, it has to be guided by the goals it pursues (learning and teaching goals). It has to be guided by pedagogical factors. For in-depth discussion, I have restructured the pedagogical sub factors. Aspects of learning and instructional media sub factors have been merged into student and teacher sub factors. The reason behind the restructuring is that the discussion of requirements related to aspect of learning and instructional media can be done clearly and in integrated way under student and teacher sub factors. The discussion under the student and teacher sub factor will include the requirement for instructional media and their roles in learning process. The pedagogical factors will now be discussed in terms of ***student, teacher, instructional design and VLE assessment sub factors.***

- **Students**' needs which are partially reflected in course objectives should be the starting point of each learning program. It implies that E-learning program designer should firstly think on how learning objectives can be achieved. The awareness of necessary activities for online learning to take place will help in determining required VLE tools to support those activities. Laurillard developed a Conversational Framework (discussed in chapter Three) summarizing activities undertaken by student and teacher to achieve learning objectives. Relating the students' needs, learning objectives and

Conversational Framework to the critical factors for E-learning effectiveness resort the following assertions:

- The dialogue between students with their teachers and students among themselves is the pillar of learning process and should be considerably enhanced. Thus VLE tools should be equipped with efficient and reliable synchronous and asynchronous communication and collaboration tools.
- Students have to act to achieve goals; VLE should provide tools to assist students in completing their assignments or other learning activities.
- Students' actions have to be assessed by teachers or other students, VLE should have tools that allow students to upload or present their achieved work.
- Students may experience difficulties while accessing or engaging with material available on VLE. Students should have a technical support which can be in form of online troubleshooting information or an agent who can assist in case problems occur.

The above are common requirements that any online learning environment should meet in assisting students in their learning process. However, there are other requirements which may differ depending on the learning context: Student's entry requirement differs from institution to another, students' determination changes due to numerous causes and so on. These contextual requirement will not be discussed because are beyond the scope of this study.

- **Teachers** have the responsibilities of planning, implementing and assessing the learning process. Those responsibilities involves a number of factors but as far as this study is concerned, the discussion will limit to the relationship between teachers responsibilities, necessary teaching activities for learning to take place and virtual learning environment. The relationship of those three dimensions suggests the following requirement to be met as basis of a successful online learning:

- The VLE should provide to the teacher tools which allow them, firstly, to communicate and collaborate with students about the course. Secondly, the VLE should provide more tools in terms of presenting learning material to students.
- Teachers must assign tasks to students to trigger their critical thinking and guide them on how to achieve learning goals. The VLE should allow teacher to set scaffolding[7] activities.
- Teachers have to assess students progress and gives feedback which can help the student's improvement. Online learning environment should have assessment and feedback tools.
- More advanced technical support should be extended to teachers as they will at some extent guide students whenever they are stuck during the course.

- **Instructional design** is defined by Gagné and Briggs (1979) as "an iterative process that refers to the structuring and arranging of resources and procedures used to promote learning in an institution". Instructional design is a crucial aspect (sub factor) in creating a successful online teaching and learning environment. Instructional design has to be highly considered in relation with the course to be given, the VLE tools as well as students. Basing on the list of instructional events to be carried out by teacher as suggested by Laurillard (2008), I have suggested requirements related to instructional design.

  - ***Activating motivation:*** I agree with Salmon (2002) who argues that student's motivation is essential for achieving their institutions' learning goals. Teachers have to attract attention of students by clarifying the

[7] a teaching strategy in which instruction begins at a level encouraging students' success and provides the right amount of support to move students to a higher level of understanding. (Crede's website : 2010)

importance and relevance of the course to be covered. Examples of finished products or targeted production in form of images, animations or video is one way stimulating student's interest in the course. In online learning situation, The VLE should provide the possibility to upload images and support video and animation files. Teachers should get training on how to design multimedia material or be assisted by experts in multimedia design.

- ***Informing learners of the objectives:*** It is important to clarify learning goals to students at the beginning of the course. Learning outcomes inform the design of tasks to be assigned to students and how they will be assessed (Institution for higher education policy: 2000). VLE should give a convenient environment for presenting the course syllabus and allow the interaction for course goals negotiation between student and teacher.
- ***Directing attention:*** The learning content has to be organized into reasonably small parts to facilitate retention. Teachers should also consider different presentation methods to accommodate different learning styles. VLE tools should allow the teacher to divide the course into desired number of parts. It should also facilitate the course presentation in different forms (text, audio, visual or other multimedia formats).
- ***Stimulating recall:*** Teachers should help students to recall what they have learned; it is done by summarizing and emphasizing important concepts and other key information. Drawings and maps can help in stimulating recall. VLE must facilitate the design of learning material facilitating the recall like drawings, maps.
- ***Providing learner guidance:*** Teachers should provide examples of best practices and hints to achieve the desired goals. It can be done by simply providing guidance in text format which does not require special features. The guidance can also be provided through simulations and computer based tutorials (CBT) and other visual materials. In that case, a VLE should embed simulation builder or computer based tutorial maker. If a

VLE does not provide those facilities, it should support popular simulation and CBT formats files.

- ***Enhancing retention:*** Students should connect new knowledge to the existing one so for easy retrieval. Teachers should design task which enhances that connection. These can be done by providing real life examples. In online learning, it can be done by providing links to website with relevant examples which can be in different formats (text, images, animations or video). VLE should provide easy way of creating links to external resources.
- ***Promoting transfer of learning***: Students should be able to use the acquired knowledge in the environment outside the course; teachers must help students by encouraging them to apply the knowledge in their daily life. Teachers can provide examples of the contexts in which knowledge and skills learnt can be applied. Depending on the course taught, online teachers can use appropriate media of communication available in most of the VLEs.
- ***Eliciting performance***: After presenting a part of/ or the whole course content, students need to practice to sharpen knowledge and skills learnt. Teachers have the responsibility to create activities which help the students to perform better; those activities should also provide information on students' understanding of the course. VLE should provide a way of supervising and assessing students' activities and progress.
- ***Providing feedback***: Students must get feedback related to their performance from their teachers. The objective of student's assessment is to determine if the learning objectives have been achieved. If the desired learning has not occurred, teacher has to provide additional guidance to students. As Laurillard (2008) argue the feedback must:
    - Provide comments about the student's performance
    - Be immediate and frequent
    - Enable students to correct their own mistakes when possible

VLE should have tools which enables teacher to easily comment on student's activity in a quick and instructive way.

- **The assessment of online learning environment** is a systematic method for collecting, analyzing, and using information from the learning environment and a measurement of its effectiveness (Astin: 1993). Online learning institutions should have strategies to assess the achievement against the targeted goals. The assessment should provide weaknesses and strengths of the online learning environment. It should also recommend corrective actions to alleviate the drawbacks and encourage good practices for more efficient results.

6.2.2 TECHNOLOGICAL FACTOR

Basing on research findings, I considered hardware; software and technical knowledge as technological sub factors. Pedagogical factor is the basis of any educational program and ignoring that factor is like navigating a ship in a strange ocean without a map and compass. However, technology is of great importance because it makes possible the delivery of education program without physical contact between the main stakeholders .The delivery of online learning education is facilitated by technological tools integrated into systems referred to as VLE or LMS. Those are applications developed by software engineers and stakeholders to facilitate education delivery in virtual environment. Softwares require physical equipments to be useful and perform specific tasks. VLE like other softwares are installed on computers called servers and participants access them through the Internet by using personal computers (technically called clients). The installation and use of the system implies human intervention. In other words, the technological factor should be dealt with under software; hardware and human intervention (technological skills) sub factors.

- **Hardware** sub factors can be discussed into two parts. There are hardware requirements for the institution and for participants.

  For the institution the hardware choice will depend on the VLE that the institution intends to use, the expected number of courses to be offered and students to be registered. The system requirements for the server (the computer on which the VLE will be installed) are usually expressed in Operating system, Central Processing Unit(CPU), Random Access Memory Hard disk and the bandwidth [8]. Online learning institution must possess the hardware which meets the requirements of the system it intends to use.

  For participants, the choice of hardware set will depend on the course content and the technology used to deriver the course. User's hardware requirement are addressed in terms of CPU, RAM, Disk drives, network cards audio and video devices (if the course includes audio-visual materials or allows teleconferencing), and printers (for easier reading).

  Though requirement for institution and participants are different, there are common characteristics that should guide the choice of the product. In research findings, Fresen (2005) and Guribye (2005) suggested that technological infrastructure should exhibit reliability, adequate functionalities, accessibility and integration into existing infrastructure. The literature provides guidance related on choosing the product that will likely exhibit the suggested characteristics. I recommend eight dimensions of product quality proposed by Garvin (1987):

  - ***Performance*** refers to a product's primary operating characteristics.

[8] a rate of data transfer measured in bits per second (bps), Wikipedia : 2010

- ***Features*** are usually the secondary aspects of performance, there are characteristics that supplement their basic functioning.
- ***Reliability*** means the probability of a product without malfunctioning or failing within a specified time period.
- ***Conformance i***s the degree to which a product's design and operating characteristics meet established standards in design and use
- ***Durability*** concerns the measure of product life. ***Serviceability*** is the speed, courtesy, competence, and ease of repair.
- ***Aesthetics*** is a subjective dimension of quality. How a product looks is a matter of personal judgment and a reflection of individual preference.
- ***Perceived Quality*** relates to the reputation of the product among customers.

- **Software** sub factor can also be addressed in considering the institution and the participant.

  For the institution, the software matters are related to VLE as it integrates different softwares into one application. To be accessible, VLE has to be compatible with previously installed software and the existing hardware. It also has requirements that have to be met in order to satisfy participants.

  Software requirements during VLE's installation are related to the web server to ensure the accessibility of web pages and the database server which deals with storage, retrieval and management of information on VLE. The requirement specifications vary from one VLE to another.

  The requirements of the VLE towards participants' satisfaction are informed by pedagogical factor discussed above. VLE should provide tools which support all online activities necessary for learning to take place. In summary, VLE should provide tools to efficiently facilitate course presentation,

communication and collaboration, practice, and assessment. VLE improves day after day and more tools are integrated. It implies that more tools may be available in the future. The only thing to keep in mind is that the creation of each tool should be guided by pedagogical needs.

Software requirements on the end user side are mostly limited to the browser supporting the technology used by VLE and an adequate Internet connection. Some online learning program requires the installation of extra softwares.

Apart from the criteria of selecting the softwares mentioned above, Garvin's dimensions of quality (see hardware part) are also useful guidelines.

- **Technological skills** are required for the efficient use of the VLE. Human skills are required to bring together technologies and make sense of it. Experts are required to set up the hardware and install the applications. On the other side, participants have to acquire skills on how to use the VLE tools in the learning and teaching process. Teachers need sufficient skills to design and develop the course easily and at their preferences. They need also skills which allow them to explain to the students on how to access the course content, perform required tasks and submit completed tasks. Students should be familiar with using computers and be equipped with other ICT skills related to the course. If students are not comfortable with the VLE, they become frustrated and it affects their performance. It may also lead to a high rate of dropout. Staff skilled in VLE technologies should be available to support users in troubleshooting or provide guidance for efficient usage.

6.2.3 MANAGERIAL FACTORS

Management is viewed as essential mechanism of putting together resources in order to achieve institutional desired goals. Managerial process involves planning, organizing, coordinating, controlling and evaluation. (Wikipedia: 2010). In academic institutions whether online or face-to-face, there is a need to a plan according to the desired goals in the future. The institutions must organize means (material, human, capital) of achieving targeted goals. With a clear plan and means to achieve goals, activities must be coordinated and controlled for efficient result. Afterwards, a comparison of achievement and expected results is done to inform the institution on weaknesses and strengths. Finally, recommendations for improvement should be provided. That process which starts from planning to evaluation explains the necessity of managerial factor for the success of E-learning. In online learning institutions, Planning will address the institutional objectives and required resources to achieve them. Pedagogical oriented objectives should be primordial because they are the basis of any educational institutional success. Other objectives should be considered as secondary.

Organisation is concerned with advertising the program, staffing, and dealing with legal issues, acquire necessary resources for E-learning program to run. Coordinating activities in E-learning involves students' registration, setting the timetable, informing teachers and provide required teaching tools. Control is essential because there is a need to ensure that learning is being conducted as planned. Control may also involve the security of VLE data and authenticity of students. At the end of a program or at a certain stage of the program, an assessment needs to be conducted and should provide useful information for improvement.

The effective E-learning requires, at the first place, the awareness and consideration of learning and teaching objectives on each stage in the process of E-learning creation. This means that pedagogical factors should lead the design, development,

implementation and assessment of E-learning projects. However, pedagogical factor has to be considered along with technological factors to unable the delivery of educational programs through the Internet and related technologies. Managerial factor is also critical to the effectiveness of E-learning as it organizes inputs for optimal output.

As learning and teaching contexts vary, there are numerous things which are necessary for E-learning to be successful and some of them may have not been addressed in this study. However, I believe that most of the factors not already mentioned will fit in pedagogical, technological or managerial factors.

6.3 DOES THE E-LEARNING PLATFORM USED BY UNISA SUPPORT IN MEETING REQUIREMENTS FOR EFFECTIVE ONLINE LEARNING ?

In this section, I will discuss the findings related to the usage assessment of the UNISA's VLE to support learning process of online students based in Rwanda.

In order to find an appropriate answer to the above question, it is essential to discuss the research findings related to the capability of UNISA VLE in supporting the learning and teaching process in general. Information about the capability of UNISA VLE will be contrasted to the research findings related on the use of the same VLE in delivering education to students based in Rwanda.

6.3.1 UNISA'S VLE CAPABILITY IN SUPPORTING THE NECESSARY LEARNING ACTIVITIES.

The discussion in this section will base on research findings related to the tools available in UNISA's VLE (SAKAI) and their relevance in facilitating the online learning process. While presenting the findings, the tools of the VLE used by UNISA (SAKAI) have been contrasted to the Laurillard's Conversational Framework. The

purpose of that confrontation was to avoid the most commonly made mistake of listing the tools and their technical robustness without indicating the educational added value of the tool. I agree with Britain & Liber (2004) who argue that

> "Although feature sets give an indication of the individual tasks a software package [or tool] can perform they fail to capture the overall picture of how well designed the software [or tool] is for supporting the integrated student [and teacher] activities mentioned in Laurillard's Conversational Framework".

While presenting findings, I realized that there is at least one tool to support each of the twelve essential learning activities of the Laurillard's Conversational Framework. However, SAKAI still needs to be improved in terms of assisting teacher to demonstrate practical skills with tools like simulation and computer based tutorials.

6.3.2 THE USE OF LOCAL UNISA'S VLE IN SUPPORTING LEARNING PROCESS OF STUDENTS BASED IN RWANDA

Information about the use of local UNISA's VLE in supporting the learning process of students based in Rwanda will be discussed under the following three related sub questions.

6.3.2.1 What are the educational media used by UNISA VLE to support learning of students based in Rwanda? and how these are used?

I have grouped tools used by local UNISA's VLE basing on the reason motivating their use.

- Tools to present course material are webpage, syllabus, wiki, email
- Tools facilitation teacher-student interactions are email, forum, chat and wiki
- Tools for assessment are assignments, quiz, drop box, grade book
- Tools for feedback are email, forum, chat, grade box, assignment

6.3.2.2 To what extent are those media used to help in Conversational Framework?

The learning and teaching process of UNISA online students based in Rwanda is supported by the SAKAI VLE. Previously, I have discussed the capability of SAKAI and the actual use of SAKAI tools in the UNISA's local VLE. The discussion in this section will be done in two parts. The first part will focus on comparing the use of tools embedded in SAKAI in supporting the learning process of UNISA online student based in Rwanda against the SAKAI capability. The comparison will be done by finding out which tools are used by local UNISA's stakeholders out of the ones available in SAKAI VLE. The information about the comparison of the system capability and its actual use is useful to the VLE assessment as it provides foundation while drawing study conclusions and recommendations. The second part will focus on finding out at what extent tools used in local UNISA's VLE support the whole learning process as described in Laurillard's Conversational Framework.

6.3.2.2.1 Comparison of SAKAI capability against its use in local UNISA's VLE.

The comparison of SAKAI used tools against those available (in SAKAI) to support the learning process is summarized in the table below. The table is organized in three columns (available tools, used tools, unused tools) and in twelve rows representing the learning and teaching activities of the Conversational Framework.

Table 4 : Comparison of SAKAI capability against its use in local UNISA's VLE

SAKAI TOOLS --- **LEARNING ACTIVITIES**	**Available tools**	**Used tools**	**Unused tools**
1. *Teacher can describe conception;*	- Web pages, - Syllabus - lesson builder, - portfolio, - resources, - Wizard and matrices. - email, - discussion forum, - Glossary, - chat, wiki, blog	- Web pages, - syllabus - email, - wiki, - forum, - chat,	- Lesson builder, - resources - portfolio , - glossary, - blog, - Wizard and matrices.
2. *Student can describe conception;*	- email, - discussion ; - forum, - Glossary, - chat, - wiki, - blog, - portfolio tools	- Web pages, - Syllabus - email, - wiki, - forum, - chat	- portofolio, - glossary, - blog
3. *Teacher can redescribe in light of Student's conception or action;*	- Web pages, - Syllabus, - lesson builder, - portfolio, - resources, - wizard and matrices. - email, - discussion forum, - Glossary, - chat, - wiki, - blog	- Web pages, - Syllabus - email, - wiki, - forum, - chat,	- Portofolio - glossary, - blog

4. *Student can redescribe in light of Teacher's redescription or student's action;*	- email, - discussion, - forum, - Glossary, - chat, - wiki, - blog, - portfolio tools	- Web pages, - Syllabus - email, - wiki, - forum, - chat	- portofolio, - glossary, - blog
5. *Teacher can adapt task goal in light of Student's description or action;*	- Web pages, - Syllabus, - lesson builder, - portfolio, - resources, - wizard and matrices. - email, - discussion, - forum, - Glossary, - chat, - wiki, - blog, - announcement, - portofolio, - assignment, - test and Quiz	- Web pages, - syllabus, - email, - wiki, - forum, - chat, - Quiz and test, - assignment, - workshop, - dropbox	- portofolio, - glossary, - blog, - announcement
6. *Teacher can set goals;*	- Web pages, - Syllabus, - lesson builder, - portfolio, - resources, - wizard and matrices. - email, - discussion forum, - Glossary, - chat, - wiki, - blog, - assignment, - test and Quiz	- Quiz, - test, - assignment, - workshop, - Web pages, - syllabus, - email, - wiki, - forum, - chat,	- portofolio, - glossary, - blog

7. *Student can act to achieve task goal;*	- email, - discussion forum, - Glossary, - chat, - wiki, - blog, - portfolio, - Assignment, - drop box, - test and quiz	- Web pages, - syllabus, - email, - wiki, - forum, - chat, - Quiz, - test, - assignment, - workshop,	- portofolio, - glossary, - blog
8. *Teacher can set up world to give intrinsic feedback on actions;*	- email, - discussion forum, - Glossary, - chat, - wiki, - blog, - Assignment, - Test and quiz, - drop box, - grade book	- Quiz, - test, - assignment, - workshop, - Web pages, - syllabus, - email, - wiki, - forum, - chat, - drop box, - grade book	- portofolio, - glossary, - blog
9. *Student can modify action in light of feedback on action;*	- email, - discussion forum, - Glossary, - chat, - wiki, - blog, - portfolio, - Assignment, - drop box, - test and quiz	- Web pages, - syllabus, - email, - wiki, - forum, - chat, - Quiz, - test, - assignment, - workshop,	- portofolio, - glossary, - blog
10. *Student can adapt actions in light of teacher's description or Student's redescription;*	- email, - discussion forum, - Glossary, - chat, - wiki, - blog, - portfolio , - Assignment, - drop box, - test and quiz	- Web pages, - syllabus, - email, - wiki, - forum, - chat, - Quiz and test, - assignment, - workshop -	- portofolio, - glossary, - blog

11. *Student can reflect on interaction to modify redescription; and*	- email, - discussion forum, - Glossary, - chat, - wiki, - blog, - portfolio tools, - Assignment, - drop box, - test and quiz	- Web pages, - syllabus, - email, - wiki, - forum, - chat, - Quiz, test, - assignment, - workshop,	- portofolio - , glossary, - blog
12. *Teacher can reflect on student's action to modify redescription.*	- Web pages, - Syllabus - lesson builder, - portfolio, - resources, - wizard and matrices. - email, - discussion forum, - Glossary, - chat, - wiki, - blog, - announcement, - portofolio, - assignment, - test and Quiz	- Web pages, - syllabus tool, - email, - wiki, - forum, - chat, - Quiz, - test, - assignment, - workshop, - dropbox	- portofolio - glossary, - blog, - announcement

Source: Own drawing

As shown in the table above, most of the SAKAI tools with ability to support necessary learning activities are used to facilitate the learning process of UNISA students based in Rwanda. However, some tools which can improve the learning effectiveness are not used.

6.3.2.2.2 To what extent do those media help the learning and teaching process (as described in the Conversational Framework)?

As shown earlier, there is at least one tool to support each of the twelve essential learning activities of the Laurillard's Conversational Framework. Although there is at least one tool to support each of the learning activities of the Conversational Framework, there are weaknesses reported. The weaknesses are grouped into two: weaknesses related to the limited use of the system and the gaps in the system itself.

Talking about the under usage of the system, there are some SAKAI tools which may improve the learning and teaching process of UNISA students based in Rwanda which are not used. Those tools are mainly portfolio (which can help the teacher to follow students' performance) tools. Blog, resources and glossary are not used in the learning teaching process. I have realized that there are some students who do not use the tools, not because there are not available but rather they are not informed about tools present in the VLE. These can be confirmed from the fact that minimal number of students stated that they used the specific tools (for example chat) while the majority reported that they have not used that tools. There are some necessary activities (3, 4, 5 and 12) of the Conversational Framework which are not carried out in the learning process of UNISA students based in Rwanda, these explain also the under usage of tools embedded in SAKAI.

The system gaps found were related to the lack of a reliable assessment system which, if available, may eliminate the use of hardcopies and transport via post offices. Lack of simulation and computer based tools also limit the possibility of practices.

In attempting to answer the second research question, I argue that the SAKAI VLE used by UNISA has the capability to support all learning activities of the Conversational Framework but there is a need to embed more tools or improve the existing ones to efficiently support the learning and teaching process. Regarding the use of SAKAI tools to deliver online education to UNISA students based in Rwanda,

I realized that most of the tools are used but others are completely ignored while they have potential to improve the learning and teaching process. The used tools do not entirely support the whole learning process because of the reasons stated above.

6.4 SUMMARY

This chapter discussed the research findings on the main themes explored in the current study: The requirement for effective E-learning and the assessment of UNISA's VLE from which students based in Rwanda undertake their studies. The requirements for effective E-learning were discussed under three main factors influencing the success of E-learning: Pedagogical, technological and managerial factors. The assessment of local UNISA's VLE was carried out by answering the second research question: "Does the E-learning platform used by UNISA support students in meeting requirements for effective online learning?" and related sub questions.

CHAPTER SEVEN: CONCLUSION AND RECOMMENDATIONS

7.1 CONCLUSION

This study set out to assess, in terms of pedagogical Conversational Framework, the UNISA's VLE used to deliver online education to students based in Rwanda. The assessment was guided by the following main questions:

- *What are the learning requirements for effective online academic learning situation?*
- *Does the E-learning platform used by UNISA support in meeting requirements for effective online learning?*

To answer the above questions, data were gathered through analysis of relevant documents and questionnaires distributed to nine UNISA online students. Documentary analysis was a basis of the study's literature review, the conceptual framework and partly guided the presentation and discussion of findings. Questionnaires were used to collect field data which reflected the reality related to the learning and teaching process in a local UNISA VLE.

The literature review synthesized what have been written under four main subchapters: E-learning overview, Virtual learning environment, effective online learning and assessment of VLE. The literature review was guided by research questions and informed me on drawing the conceptual framework mainly based on pedagogical Conversational Framework.

The presentation and discussion of findings confronted collected data and the pedagogical Conversational Framework to determine the requirements for effective online academic and find out if the E-learning platform used by UNISA supports the learning delivery process of online students based in Rwanda.

The research revealed that the effectiveness of E-learning is function of different interrelated and inter independent factors that can be grouped under three main factors: Pedagogical, technological and managerial factors. It was found that pedagogical factor is the central pillar and the map in designing, implementing and evaluating any online learning program.

Concerning the second research question, it was found that the UNISA VLE used to deliver online education to students based in Rwanda provides at least a tool to support each learning activity of the pedagogical Conversational Framework. Although the VLE has the capability of supporting each of the necessary learning activity, it was revealed that the use of the VLE was not optimized to meet the learning goals. The reason for that can be classified as follow:

- Some necessary learning activities are not taken into serious consideration or are merely ignored while the VLE provides tools to support those activities
- Even for activities undertaken, learning stakeholders underuse the available system tools. Some tools which may efficiently facilitate the learning and teaching process are rarely used or simply not used at all. This is caused by the lack of familiarity with the system, user ignorance or less motivation to use the tool.

Another issue reported in the current study is the system shortcomings to support the learning activities as / or better than they are conducted in a face-to-face environment. Activities related to assessment and practices are weakly supported by UNISA's VLE when compared on how they are conducted in traditional education. This is the reason why learning stakeholders prefer to blend online with traditional learning. Students write exam on hardcopies which are sent to teachers and returned after marking. As reported by students, this learning environment lacks the space or tools for practical activities required in the learning process.

7.2 RECOMMENDATIONS

Research findings and related discussions inspired following recommendations:

- The Conversational Framework proposed by Laurillard is of utmost importance towards learning goals achievement as it has been put forward in the literature. It is recommended to teachers involved in delivering learning to UNISA online students based in Rwanda to consider activities for better results in future.
- I have mentioned, in the literature review chapter, that the use of too much technology does not necessarily lead to the education improvement; it is only beneficial to education when motivated by pedagogical reason. However, education stakeholders need to know the capability of IT tools and decide how to use them in facilitating the learning and teaching process. I recommend UNISA's VLE users(both teachers and students) to explore the range of tools available, and learn how to use them and integrate them in the learning process where relevant
- The gaps of VLE calls for VLE improvement. I recommend the developers to invest more efforts in integrating tools like tutorial and simulation creators as well as more reliable assessment tools in the upcoming version of VLEs. Meanwhile, current VLE users are recommended to complement VLE tools with different standalone technologies which can assist in improving the learning and teaching process.

7.3 AREAS FOR FURTHER RESEARCH

The research findings based on data collected from online students as one part of main learning stakeholders and considered one local UNISA's VLE. Some information on the use of the UNISA VLE could not be collected from students. I call

for a research which may be based on the data collected from both teachers and students.

The study considered one local UNISA VLE among numerous environments different from the case study. The findings cannot be reliably generalized to the whole UNISA VLE. To get findings on a larger (holistic) scale, I call for a similar study to be conducted on a representative number of UNISA's VLEs

Since assessment in E-learning environment continues to be problematic, I would encourage researchers from different fields to conduct studies addressing that particular issue of E-learning practices.

APPENDICES

APPENDIX A: QUESTIONNAIRE

1. Does the course provide the following? (Check all that apply):

	YES	NO	NON APPLICABLE	OTHER
Course Goals				
Learning outcomes				
Course structure/ overview				
Assessment criteria				
Prerequisite (to be unrolled on the course)				
Other (specify)				

2. Which presentation modes do teachers use to present/express their ideas to students? (check all that apply)

   - Text
   - Graphics
   - Audio
   - Video
   - Animation
   - Not applicable
   - Other (specify below)

   ……
   ……
   ……

3. Which system tools do teachers use to present/express their ideas to students?

   - Web pages
   - Syllabus tool
   - Email
   - Wiki

- Forums
- Chat room
- Other (specify below)

……
……
……
……

4. Is the course (content) presentation appropriately matched to the method of delivery?
    - Yes
    - No
    - Not applicable

Please, justify your choice

……
……
……
……

5. How effective is the mixture of multimedia attributes in creating a rich environment for active learning?
    - Very effective
    - Moderately effective
    - Not effective
    - Not applicable
    - Other, specify

      ……
      ……
      ……
      ……

6. Does the virtual learning platform allow students to have some control over the material to be learned,
   Check all that apply:
    - Students write up discussion questions
    - Students select the path to navigate through instructions
    - Students negotiate learning goals
    - Students select working group
    - Students negotiate evaluation criteria
    - Other specify

      ……
      ……
      ……
      ……

7. Which presentation modes do student use to present/express their ideas to teachers? (check all that apply)

    - Text
    - Graphics
    - Audio
    - Video
    - Not applicable
    - Other, specify

    ……
    ……
    ……
    ……

8. Which system tools do students use to present/express their ideas to teachers?
    - Web pages
    - Syllabus tool
    - Email
    - Wiki
    - Forums
    - Chat room
    - Other (specify below)

    ……
    ……
    ……

9. Can teachers and learners extend/change their presentations during the module's time period?

    - Yes
    - No
    - Sometimes
    - Not applicable

Please, justify your choice

……
……
……

10. To what extent is it possible for the teacher to adapt the module structure once teaching is underway?
    - Can a teacher add / change / delete resources?
    - Can a teacher add / change / delete fragments of module structure

- Can a teacher add / remove people? Can teacher split them into different groups?
- Can a teacher create and assign resources or learning activities to individuals?
- Other, specify

  ……
  ……
  ……
  …….

11. What types of learning activity are supported by the system?
    - Synchronous discussion (e.g chat)
    - Asynchronous discussion (e.g forum)
    - Quizzes and test
    - Assignment
    - Workshop
    - Wiki
    - Other (specify below)

    ……
    ……
    ……

12. Which tools do teachers use to assign tasks to students?
    - None
    - Quizzes
    - Tests
    - Assignment
    - Announcement
    - Email
    - Wepages
    - Other (specify below)

    ……
    ……
    ……

13. Do teachers provide a tasks which facilitate an intrinsic feedback (immediate feedback from action) e.g. : automated Quizzes
    - Yes
    - No
    - Not applicable

If yes, describe the media used

……
……
……

14. Which system tools do students use to present/submit their (accomplished tasks) work?

    - None
    - Drop box
    - Email
    - Assignment upload tools
    - Other (specify below)

    ……
    ……
    ……

15. What facilities are there to monitor how well learning is progressing on the module?
    - None
    - Grade book
    - Participation rate
    - Other (specify below)

    ……
    ……
    ……

16. How do teachers provide an extrinsic (right or wrong, approval or disapproval) feedback to their students?

    - None
    - Through email
    - Automated feedback
    - Other (specify below)

      ……
      ……
      ……

17. Can students monitor their own activity? Check all that apply
    - For example can they obtain statistics on what they are spending most time on,
    - Whether their time is being evenly shared or not?
    - Can students provide feedback on the quality of the module?
    - Other, specify

……
……
……
……

18. Does the course use easy-to-understand terminology?
    - Yes
    - No
    - Sometimes
    - Not applicable

    If no, explain

    ……
    ……
    ……

19. Does the course include a Frequently Asked Question (FAQ) page?
    - Yes
    - No

If yes, do you have chance to edit or add the content? How ?

……
……
……

20. Does the course provide any guidance to students on how to organize for online Learning?
    - Yes
    - No
    - Not applicable

If no, how do you proceed when stuck?

……
……
……

21. Do assessments provide students with the opportunity to demonstrate what they have learned in the course?

    - Yes
    - No
    - sometimes
    - Not applicable

Please, Justify your choice

……
……
……

22. Does the course provide practice items for learners on its various lessons?
    - Yes
    - No
    - Not applicable

If yes, explain how the practice is done and describe tools which are used to facilitate practice sessions? (e.g : simulations, games,…)

……
……
……
……

23. Does the course include authentic assessment strategies to evaluate real-world Skills ?
    - Yes
    - No
    - Sometimes
    - Not applicable

Please , justify your choice

……
……
……

24. If yes, how is assessment done and which tools are used to facilitate those assessment?

    ……
    ……
    ……
    ……

25. If there is something you would like to add, the space below is reserved for you

    ……
    ……
    ……
    ……
    ……

THANK YOU!

APPENDIX B: Invitation letter and consent form

Dear UNISA student

My name is Gilbert MUNYEMANA and I am a Masters of Education student at WITS. I invite you to voluntarily participate in my research project**.** The purpose of my study is to conduct a pedagogical assessment of the UNISA's virtual learning environment from which online students staying in Rwanda undertake their studies

My study is of a qualitative nature and requires your participation where you will be asked to complete individual written questionnaire. You are invited to describe your experience with UNISA's online learning environment in Rwanda.

Your participation is voluntary. You may withdraw from the study at any time and there are no adverse consequences for choosing to do so. You will not be asked to give your name in order to guarantee your anonymity. The data collected from the questionnaires will be kept confidential and analyzed for research purposes only. At the end of the study you will be informed about the research findings.

Please provide your consent to ensure that you will complete my research questionnaire. Please add your contact number and/or email address to make the necessary appointments.

Yours faithfully

Mr. Gilbert MUNYEMANA
M.Ed. student
Contact Number: + 27 0734845740.

Research supervisor: Prof Ian Moll

I……. (Name & surname), understand the nature, requirements and benefit of participating in the study, consent to participate in the study.

Contact number:…….. and/or

Email address ……..

APPENDIX C: ETHICS CLEARENCE

Wits School of Education

27 St Andrews Road, Parktown, Johannesburg, 2193 • Private Bag 3, Wits 2050, South Africa
Tel: +27 11 717-3007 • Fax: +27 11 717-3009 • E-mail: enquiries@educ.wits.ac.za • Website: www.wits.ac.za

Student Number: 416594
Protocol: 2010ECE08C

Mr Gilbert Munyemana
National University of Rwanda
P O Box 117
BUTARE

09 July 2010

Dear Mr. Munyemana

Application for Ethics Clearance: Master of Education

I have a pleasure in advising you that the Ethics Committee in Education of the Faculty of Humanities, acting on behalf of the Senate has agreed to approve your application for ethics clearance submitted for your proposal entitled:

A critical assessment at local level of UNISA's virtual learning environment in terms of the pedagogical conversational framework

The Protocol Number above should be submitted to the Graduate Studies in Education Committee upon submission of your final research report.

Yours sincerely

M Mabeta

Matsie Mabeta
Wits School of Education

Cc Supervisor: Prof. I Moll

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