

FACULTY OF BUSINESS AND ECONOMICS

**VIRTUAL CLASSROOM SYSTEM: A CASE OF MULTIMEDIA UNIVERSITY OF KENYA**

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**BUS-242-063/2013**

**A Research Documentation Submitted to the school of Business and Economics in Partial Fulfillment for the Degree of Bachelor of Business Information Technology**

**November 2017**

# DECLARATION

**STUDENT**

I declare that this proposal is my original work and has never been presented for the award of degree or diploma in any other University or Institution.

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# APPROVAL BY THE UNIVERSITY SUPERVISOR

I declare that this project documentation is presented to the University for Examination with my approval as the supervisor.

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# DEDICATION

This work is dedicated to my entire family who has always supported me and guided me throughout my education. I thank you for the mental and emotional support I have got from you. My God bless you all.

# ACKNOWLEDGEMENT

I wish to express my sincere gratitude to the course supervisor Mr. Ishmael N.A. who dedicated his limited time and effort to see this unit a success. May God bless him abundantly. Special regards also go to Multimedia University of Kenya for the opportunity and guidance through my four-year course in the institution.

Most of all, I give all the honor and glory to the mighty God for his abounding love and blessing throughout this period of research.

I acknowledge my family who saw to my financial and physical well-being. I also acknowledge my friends for their continued support and encouragement.

Thank you and May God bless you all.

# ABSTRACT

In the current world we are living in education and learning has become a key part of our society. Advanced technology opens broad teaching/learning opportunities though concomitantly providing divergent expectations concerning the quality of E-Learning. Many educators are using blended-learning and developing creative methods to integrate technology. Virtual classrooms and discussion forums are collaborative tools widely used in Higher Education*.* The mode by which education is passed from the teacher to the students play a key role in the final success of the student. The use of the internet is increasing in our universities most specific Multimedia University of Kenya (MMUK) as students use the internet frequently to aid their study. The research will be carried out in Multimedia University of Kenya. The study uses a population of 100 students and 20 personnel, grouped under samples of 10. The researcher extends the current understanding of information richness theory to suggest that use of multiple media can enrich the communication context and perceived learning. The Theory of Online Learning also discusses learning environments containing three main components which include students, instructors and content. A Virtual Classroom System would play a big role in the use of internet. Internet access would provide the users with an easy access to the VCS platform enabling an interaction between the students and the lectures hence enabling continuous learning. This will reduce the manual activities where the students must meet face to face with their lecture for any learning or discussion to take place. It will also reduce paper work where students have to manually write notes in class instead notes are provided to them in the platform and they can make short notes as they engage their lecture in the areas they don’t get difficulties. The project has been conceptualized to modernize and compliment the learning and teaching function of Multimedia University of Kenya (MMUK) by enhancing online learning among the university students within the boundaries of Multimedia University. There will be 3 interfaces in this project: Admin, faculty and Student where all three will be have unique tasks to perform. The admin will manage all the activities of the site. The faculties will be uploading notices about the activities in the colleges in the home page of the site which helps the students to take part in several activities. Staffs of different faculty will be conducting quiz on their courses which allows the students of that faculty to participate in the quiz. Study materials will be uploaded by the staffs to help students in their studies. Staffs can also interact with their students if the students have any doubts on their curriculum. Students can download the study materials uploaded by their faculty. Any doubts in their curriculum they can interact with their faculties and even other students of that course can clarify them. Students can take part in the quiz conducted by their faculty. They can also participate in with other students in discussion for much more understanding of their learning materials and solving of difficult problems. The objective of this project is to provide a single platform for students and faculties to interact with each other. The methodology to be used for the development of the system will be the RAD. The proposed system will be developed using PHP, JavaScript, JQuery, HTML, Bootstrap, CSS and MySQL

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# ACRONYMS

**CMC –** Computer-Mediated Communications

**ICT** – Information and Communication Technology

**IRT–** Information Richness Theory

**LAN –** Local Area Network

**MMUK** – Multimedia University of Kenya

**MOOC –** Massive Online Open Course

**MRT –** Media Richness Theory

**ODF –** Online Discussion Forum

**TSR –** Teacher Student Relation

**VCS** – Virtual Classroom System

**WAN –** Wide Area Network

**WWW –** World Wide Web

# CHAPTER ONE

# INTRODUCTION

#### **1.1 INTRODUCTION**

This chapter contains the background of the study, statement of the problem, research objectives, specific objectives, research questions, significance of the study, limitations and delimitations and scope of the study.

# 1.2 BACKGROUND OF THE STUDY

In recent years education has been a key element and a necessity for every individual. Every parent is investing heavily in the education of their children as it is perceived that good and quality education come a long with several benefits. In Kenya, there are several levels of education from primary school through secondary school to tertiary education which is seen as the most vital stage of education an individual can acquire. The manner in which such education is passed plays a big role in the success or failure of an individual. Some students are first learners while others take time before they can actually get grasp of the contents of what they are being taught. The primary mode of teaching in most of our universities in Kenya is the physical presentation of a student to a class which also requires the lecturer or teacher to be physically present in the class for learning to take place. In absentia of the lecturer means that there will be no class happening. The reason that many students cannot pass their exams well is due to lack of access to additional reading materials and engagement time with their lectures.

Now with the increasing demand for education, means there is increased number of students hence the level of commitment by the lecture must increase for each student to understand what is being taught in class. More innovative ways are now in great need to provide alternative methods to help in the delivery of education.

Information and communication technology (ICT) is rapidly increasing and is one of the major methods that can be used to conduct teaching. A virtual classroom system (VCS) would play an integral part in this highly computer dominated society such as Multimedia University of Kenya. A VCS will provide a means for off-class communication between the lectures and students. Students would be able to access reading materials as posted by their lecture, engage in discussion of any technicalities that the students may have come across while undertaking their course work. This would complement the in-class discussions that happens and a student who was not in class can follow the discussions from the virtual classroom to help them understand the contents that they missed in class. Lectures will find time to attend to each student in person. This means that at the end of the semester when examination time arrives, each student would be highly equipped with the knowledge in that unit hence there will be reduced cases of failure, reduced cheating which mostly occur due to lack of content by the student.

Information flow between the lectures, students and the faculty will be improved. The forum will also act as an Online Discussion Forum (ODF) where students can raise their issues and they get addressed. The faculty will also be able to pass any information they may have such as exam dates and timetable, information on supplementary exams and may other vital information which is always communicated manually.

# 1.3 STATEMENT OF THE PROBLEM

Multimedia University of Kenya is one of the many modern public University with the challenge lectures absenteeism and inadequate communication among students and faculty lecturers outside class. This is because in many cases the students, lecturers and the faculty personnel have to meet only in class probably once in a week for only three hours. Sometimes lecturers may be unable to make it to class due to other personal commitments leaving students idle throughout that entire time. There is also lack of communication between faculty administration and students where students can actually raise their academic issues and get addressed by the faculty dean. When such a scenario exists, students will actually be unable to communicate and have adequate time with their lectures outside class and faculty heads to address their concerns. Consequently, in order to solve such a problem, there is the need to implement a virtual classroom system to bridge the existing gap between the students, lecturers and faculty heads and improve continuous learning and communication between students and lectures in the university.

# 1.4 OBJECTIVE OF THE STUDY

### **1.4.1 Main Objective of the Study**

The general objective of the study is:

To create a virtual classroom system for Multimedia University of Kenya (MMUK).

### **Specific Objectives of the Study**

1. To enhance off-class consultation between the lectures and the students in Multimedia University of Kenya.
2. To create an online planform where students can engage each other in solving their academic problems.
3. Narrow the communication gap between the students and the faculty administrators.

# RESEARCH QUESTIONS

1. How will the system enhance off-class consultation between the lectures and the students in Multimedia University of Kenya?
2. To what extent will an online platform help students engage each other in discussions to help them solve their problems?
3. How does the system help to narrow the communication gap between the students and the faculty administrators?

# SIGNIFICANCE OF THE STUDY

The major beneficiaries of this system would be the students, lectures and faculty administrators. In Virtual Classroom System (VCS) there is one to one communication between the lectures and students, faculty administration and the students, students to fellow students outside the classroom at any given time. The lecturer will be able to offer one to one solutions to problems that their students at any time. This will help the students understand better what they may have been taught in class.

The faculty administrator will be able to communicate any information to a certain without the need to do manual memos which are very inconveniencing to students.

The lecture will not have to worry about sharing of notes and other learning materials as they can just upload the materials for the students to download hence saving on the hustle that the lectures go through while printing reading materials.

# LIMITATIONS AND DELIMITATIONS

**Lack of adequate Tools and Technology:** Online platform is not developed up to the mark yet, computer software have not developed enough in Kenya. Most teachers are not aware of ICT and computer technology, some are afraid of following the recent trends in education system. This can be solved by increased research and awareness on the ICT sector.

**Lack of Interaction with Learners:** There is no live interaction of learner with the teacher as well as co-learners, the effective teaching methodology that is Interaction and Question-Answer method is not possible to follow in VCS. The doubts of the learners remain unanswered, lapses the monitoring of the students. One of the basic principles of education is all-round development of the student which is not possible in this method due to lack of proper guidance and motivation.

**Technical Limitations:** Kenya is still a developing country, the computer technology and internet facilities are not available everywhere in the country which are essential for VCS. Intense technical training can help solve this problem.

# SCOPE OF THE STUDY

Multimedia University of Kenya is one of the fastest growing public University in Kenya and is bound to face pressure on the increasing demand for university education. This system seeks to provide an avenue where the students can engage their teachers outside class. It seeks to provide an online classroom hence MMUK forms an important area of study. The study will take place for four months and will help me understand all the operations that takes place in a normal classroom and the business operations that the students and lectures engage in.

# ASSUMPTIONS OF THE STUDY

While conducting this study, the researcher assumed that all the university Students lecturers and the faculty administration personnel have access to a computer connected over the internet with adequate computer knowledge to enable them use the system with no problem. Also, it is assumed that if such one cannot gain access to a computer, they at least have a smart phone to access such a system through their mobile phones. It is also assumed that this problem is pertinent in other institutions, and therefore the system can be adopted by other institutions across Kenya to streamline the student-lectures off normal class engagements.

# DEFINITION OF TERMS

**Classroom**: A room or a building where students gather to get taught.

**Discussion:** The action or process of talking about something, typically in order to reach a decision or to exchange ideas.

**E-learning:** Conducting the learning process online over the internet.

**Forum:** A place, meeting, or medium where ideas and views on a particular issue can be exchanged.

**Instructor:** A person guides students on their course work.

**Off-class:** Outside of the physical classroom.

**Virtual classroom:** An online platform created using the internet, computer devices in which the lecturer is not physically present or the students are remotely located.

**Virtual**: means a simulation of the real thing.

# CHAPTER TWO

# LITERATURE REVIEW

# 2.1 Introduction

This chapter looks deep at the large pool of existing literature relevant to my topic and its objectives. It gives an insight into the literature by other scholars and researchers on the aspect of Virtual Classroom Systems. It covers the past studies where it discusses literature related to the specific objectives of the study. It also presents literature on the critical review of major issue, summary, gaps to be filled and the conceptual framework.

# 2.2 Review of theoretical framework

This section provides an insight into the theoretical theories that show where the study has been based on. It also includes literature by other scholars and the existing systems as per the research carried out on the aspect of Virtual Classroom System.

### **2.2.1 The Theory of Online Learning**

The ‘Theory of Online Learning’ as proposed by Anderson (2004), argues that effective learning environment affords many modalities of interactions between the three macro components namely students, instructors and content. He consequently presents the six typologies of interactions namely student-student, student-instructor, student-content, instructor-instructor, instructor-content and content-content interactions that serve as the basis of educational process in learning environment or institutions. These interactions are described as critical to effective communication & learning and take place when the learning environment is learner-centered, knowledge-centered, assessment-centered, and community-centered. Interactivity has been considered as central tenet to the concept of ‘online learning theory’. Using online instructional tools provide unique opportunities for the instructor or administrators to engage students in various activities and offer a new dimension for interaction – active and higher-order. It changes the way students, instructors and administrators interact, motivating them to be more attentive and participative, and encourages the process of learning. The role of instructor in facilitating discourse becomes decisive to overcome restrictions due to individual characteristics such as personality traits and lead to enhanced communications. Additionally, students have to demonstrate strong internet efficacy for active participation and interaction.

Using online resources expand the opportunities for students to reflect upon their thinking and experience the discourse with other students and other institution’s personnel. It individualizes their learning experience facilitating development of deep level learning and “new knowledge structures” (Anderson, 2004, p. 37). The asynchronous communications facilitate personalization by allowing the students to learn at their own pace and according to their interest, previous knowledge and style. This represents the knowledge-centered view of online learning theory. It is noted by Anderson (2004) that assessment determines if the learning objectives of using online tools had been accomplished. The instructor needs to structure the online discussions to configure with classroom lectures, create experiences leading to outcome, and discuss and use assessment to improve learning. Additionally, feedback is an important part of this assessment- centered learning and influences the approach to learning. The last perspective of online learning theory is the community or social component of online learning. The interactions in the online forum promote a sense of community or social connectivity between the learners and instructors. The level of connectedness among the students results in formation of productive relationships among the class members and in collaborative exploration of the subject matter. Previous research has shown that learning communities exhibit increased student learning, and course satisfaction. As suggested by this theory, it is proposed that learning effectiveness in using VCS is influenced by the interactions and communication. The level of interaction depends on the learning environment (facilitating discourse, reflective thinking, assessment and feedback, and sense of community), learning process (personalization) and learner characteristics (personality and internet efficacy).

### **2.2.2 Information Richness Theory**

Information Richness Theory (IRT), also known as Media Richness Theory (MRT) is widely known theory of media use, posits that communication efficiency will be improved by matching media to the students’ task information needs (Daft and Lengel, 1986). The theory provides a framework for describing a communication medium's ability to reproduce the information sent over it without loss or distortion. The authors argue that media differ in their “richness” or the ability to convey information. This richness depends on media characteristics such as capability to provide immediate feedback, message personalization, available language variety, and communication and social cues. Critics of Computer-Mediated Communications (CMC) contend that the low richness of the text-based discussion forums and their lack of audio-visual and nonverbal cues, physical appearance and physical environment lead to communication ambiguity and loss of meaning (Ward et al. 1998). Non- verbal cues communicate feelings and attitudes and invoke students’ arousal or sensory stimulation leading to more intense interactions. In such case, according to this literature, the lack of cues in VCSs does not support social interaction among the members. However, contrary to the argument, we propose that the lack of cues may unbind the social hierarchy in the online environment resulting in more democratic and equal participation from members. According to Volery and Lord (2000), a rich medium should support both asynchronous and synchronous communications. Using web- based resources with face-to-face teaching can engage students in communicative exchanges with other participants through multiple mediums and can provide a richer communication context than a traditional lectures approach alone. Dennis and Valacich (2008) state that “choosing one single medium for any task may prove less effective than choosing a medium or set of media which the groups uses at different times performing the talks, depending on the current communication process (convey or converge)”. With face-to-face lecture being the richest media having multiple channels to communicate information (verbal and non-verbal), adding technology to the process enables more cues exchanged with greater opportunity for feedback. This can lead to a qualitatively different learning experience for the students. Using a combination of technologies can create a spectrum of media richness. Ruberg, Taylor and Moore (1996) viewed that social convention in the online environment encourages students to overcome the lack of cues and maximizes the interactions between students, instructor and content. When compared to face-to-face medium, CMCs encourage experimentation, provide opportunities to discuss, and facilitate social learning.

Most recent study proposes that use of web-based forums with face-to-face lectures can promote rich interaction among students, instructor and content resulting in improved learning understanding among students.

# 2.3 Review of Theoretical Literature

 Social constructivist, connectivism, and transformative learning theories have components of building communities through dialog, discussion and reflecting to allow learners to develop deeper understanding and gain knowledge on what they learn. Virtual learning has grown rapidly in the past few years in colleges and universities. There are barriers to avoid, as well as key components to include, when creating online learning environments. There are many technology options to choose from to deliver course material.

### **2.3.1 Enhancing Off-class Consultation**

Consultation is a key and a fundamental part of learning. In 1995, Baumeister and Leary published a review article focusing on the human need to belong, proposing the belongingness hypothesis, that ‘human beings are fundamentally and pervasively motivated by a need to belong, that is, by a strong desire to form and maintain enduring interpersonal attachments’ (p. 522). Subsequent research has demonstrated that quality relationships have an impact on human beings with respect to motivation, social competence and wellbeing in general (Bergin & Bergin,[2009](http://www.tandfonline.com/doi/full/10.1080/03054985.2014.921613)) but also in regard to specific outcomes across different educational contexts.

The need to belong also affects university teachers. Thus, it is likely that a positive relational classroom environment, including positive interactions and relationships, may also have positive effects on the teachers themselves on teachers’ positive emotions (Hagenauer & Volet, [2014](http://www.tandfonline.com/doi/full/10.1080/03054985.2014.921613)). Trigwell & Shale (2004) argue that given the increasing importance ascribed to excellence in university teaching, the significance of TSR requires detailed investigation. Virtual Classroom System can play a big role to enhance positive relationship between teacher – student in public universities in Kenya.

### **2.3.2 Creating Online Learning Platform**

Loyens and Gijbels (2008) argue that a key component of a constructivist learning environment is self-regulation. Students will not be successful in a constructivist learning environment if they are unable to set goals, develop a plan of action, and complete necessary steps to solve the problem. Students need opportunities to build deeper understandings when taking an online class. Learners build deeper understandings of the subject while working through a problem which are availed to them by the teacher in the virtual learning environment.

According to Dr. Ruth Brown (2001) there are three stages to building community in online/ virtual learning. First, students become acquainted. Second, students begin, through longer interactions, to discover similarities and differences between themselves and their classmates and begin to interact with the course content.  In the third stage, students begin supporting one another and taking their friendship outside the course requirements. Students new to online classes will need more support from the instructor compared to veteran students. Beginning students are happiest with short assignment and prefer frequent feedback from their professor and supervisor. Veteran online students do not need as much hand-holding by their professor. Their conversations show connections from shared past points of view and from courses they have taken together (Brown, 2001).

The effectiveness of the learning community can be seen when all members share ideas and reflect on the process together. Online virtual classes work best when members enter into relationships by getting to know each other, by participating in online discussions about the learning material, and by supporting one another’s learning and understanding (Silvers, P., O’Connell, J., & Fewell, M.,2007). Silvers, O’Connell, and Fewell (2007) identified several strategies for building community. Some of the strategies are journaling, responding to discussions, emailing, creating digital presentations, and collaborating.

### **2.3.3 Using Virtual Classroom System to close communication Gap**

Onah, Sinclare & Boyatt (2007) argue that Online Discussion Forums have been used as online learning tools since 1999 to increase student motivation and also facilitate interactions between the various stakeholders in academic institutions. The latter has continuously prompted the creation of Massive Online Open Course (MOOC) via which different learning activities are coordinated. This is because the latter has been described as a disrupting force changing the landscape of management in almost all institutions (Onah, Sinclare & Boyatt, 2009). However, the latter has been improved by an increase in the speed and power of computing, high coverage, fast and cheap networks as well as increased levels of computer literacy in modern institutions. The authors further affirm that with the rising dependency on the internet, the rising alternatives of Internet Service Providers and High speed network topologies such as the Local Area Networks (LAN), Wide Area Networks (WAN), Metropolitan Area Networks (MAN) and the high efficiency of the World Wide Web (WWW), it is possible for institutions to amplify the use of Virtual Classroom System (VCS) and Online Discussion Forum (ODF) in other domains (Onah, Sinclare & Boyatt, 2009). This is because once implemented in other domains, far from eLearning, such a forum can be used solve problems within the institution by reducing the communication gap. In all the above discussed paragraphs, Onah, Sinclare & Boyatt (2007) describe the power of online discussion forum in closing any existing communication gaps between students, faculty administration personnel and any other stakeholder to learning institutions.

# 2.4 Critical Review

This section critic the literature by other scholars and researchers on the aspect of Virtual Classroom Systems. It also presents the views that have not been discussed by the researchers and the objectives that have not been mentioned.

# 2.4.1 Review of the existing systems

# a) Existing physical class attendance system

Many of the existing system of learning in the Kenya is physical attendance of class where everything is done manual. The instructor must be present and the students too must be present for any learning to take place. Notes and learning materials are deliver manually which require manual writing. This system is difficult and it involves a lot of paper work which is not only tiresome but also costly and time consuming. With the current technology and cheap internet packages, improvements need to be done to help students save on unnecessary costs. This web based Virtual Classroom System is designed to fill the gap by providing an online platform for conducting learning which is friendly to students and instructors. The system will also help in easing the congestion found in offices whenever the students have an issue to be addressed by the faculty administrators. This manual poses a challenge when it comes to accessing notes and learning materials in case a student is unable to attend class. This system entirely is dependent on availability of instructor and the students. If any of the two parties are not available, no learning can take place. The system does not make use of existing technology adequately.

**Limitations of the system**

They system does not enhance off-class consultation as in accordance to objective one which is to ensure off-class consultation between the students and the instructor. The proposed Virtual Classroom System will solve this problem by offering a platform where students and instructors are able to engage each other at their convenient time outside the class hours.

This manual system is also affected by the communication gap present between the instructor-students and administration-students. The proposed system will avail an online platform where each of the parties can present any formal communication that require passage to the other party. This will eliminate the manual use of memos to pass information and reduce paper work hence save on our environment in the long run.

# b) ELecta Live Virtual Classroom

ELecta Live is virtual classroom software and a real-time online collaboration environment designed for teaching and training over the Internet. With eLecta Live you can arrange live classes, online lectures, web meetings, group sessions, individual one–on–one sessions and webinars, all taking place real-time over the web. For your web conferences you only need a computer with an internet connection. It is a universal online training solution supported on multiple platforms. With ELecta Live, you can easily and effectively host web based meetings, significantly reducing teleconferencing and travel costs and decreasing time away from job. Teachers and administrators save significant amounts per year by not having to travel long distances for meetings and professional development. And this doesn’t take into effect the elimination of the cost of substitute teachers for those on the road.

**Limitation of the system**

the system provides live streaming which is essential but very uneconomical. Live streams require a very large bandwidth to support it. Most public universities in Kenya are unable to provide adequate network connectivity to support real time live steaming of videos. High performing computers are also required for live meetings. The proposed system of Virtual Classroom System offer a text based platform that can be supported by audio that does not require large bandwidth. This saves on cost and helps the students and the institution to save for the future.

# 2.5 Research Gap

There is a wide field that is un-researched on the area of virtual learning and online discussion forums and there exists a need to integrate the massively growing use of technology in our learning process. Blended learning promotes student centered learning and encourages increased student interaction (Davies & Graff 2005).

Evidently, all past scholars have focused on other domains MOOC systems but failed to recognize the need for collaboration in the system. Most MOOC systems are live streams which require a larger bandwidth hence need to develop an online learning environment that does not really require live stream hence saving on the internet cost by the individuals using the system.

The researcher’s main concern it to build an online discussion and learning platform that can accommodate use of technology to its fullness without much cost on the internet cost.

# 2.6 Summary

The literature review highlighted the need for a web based learning environment. Literature review on other existing systems has been reviewed for the purpose of comparison and have led to realization of the need of the gap the proposed system can fill.

Literature review from the existing learning environments show that learning in most Kenyan public universities is done manually where students must attend the class manually and the instructor must be present for any form of learning to take place. This manual system is difficult to use since it involves a lot of paper work which are not only tiresome but also costly and time consuming.

The online teaching environment is a powerful medium for promoting higher-order thinking skills in public university students, though the concept of virtual cooperation is highly problematic. It is not pedantry to assert that the popular “telework” notion of “telepresence” does not fully coincide with complete interaction that characterizes ideal teamwork (Pyoria 2007). Educators have taken advantage of the internet because it is a popular global platform which can independently support education through creating, sharing, and distributing knowledge. Peer socialization and the establishment of a peer network are a crucial component of educational experiences for graduate students (Luo 2010).

It is held that blended learning promotes student-centered-learning and encourages increased student interaction (Davies & Graff 2005). Online collaboration allows students to experiment with technology, develop their own technical skills, and become sensitized to the technological environments and capabilities of others. Interactive tutorials with timely feedback, simulating multimedia environments with live-like visualizations, flexible time and learning environment are factors that empower students to actively control their learning environment and engage in critical thinking (Garrison & Kanuka 2004; Dzuiban, Hartman, & Moskel 2004).

It has been noted that VCS and ODF provides an effective training ground, an opportunity to improve student’s communication skills, create a positive learning attitude, address different learning styles, enjoy using technology, and cater to those who work best with others (Curtis & Lawson 2001; Ravenscroft 1997; Ellsworth 1995; Kolb 1984). Nonaka and Konno (1998), argue that as students work with others, they sort out differences, negotiate meaning, figure out how to conduct their project together, make decisions together in order to arrive at synergy in performance (Adler 2002).

# 2.7 Conceptual Framework

**Independent variables**

|  |
| --- |
| Consultation |

|  |
| --- |
| Virtual Classroom System |

**Dependent variable**

|  |
| --- |
| Online Platform |

|  |
| --- |
| Communication |

|  |
| --- |
| Network availability |
| Computer knowledge |
| Computer hardware and software availability |

**Moderating factors**

**Figure 2. 1 Conceptual Framework (Author, 2017)**

**Dependent variable**

The dependent variable is the Virtual Classroom System. It is the main dependent factor and does not change throughout the study.

**Independent variables**

**Consultation –** This is an independent variable of the system. Implementing the system will enhance off-class consultation between students and lectures.

**Online Platform –** The second independent variable is an online platform that can enable the users to learn as well as interact. It directly affects the Virtual Classroom System as the level of education of the users directly affect their system usability functions.

**Communication –** Effective communication is an independent variable of the system. For effective and reliable communication between the students and the administration, the system is dependent on this factor.

**Moderating variables**

These are factors that facilitate the usage and operation of the system. They include network availability, computer knowledge and literacy and availability of computer hardware and software.

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