IMPROVING THE USE OF DIGITAL LITERACY BY TEACHING STAFF AT KYAMBOGO UNIVERSITY ON THE E-LEARNING MANAGEMENT SYSTEM (KELMS): A CASE OF MASTERS IN VOCATIONAL PEDAGOGY

BY

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DECLARATION

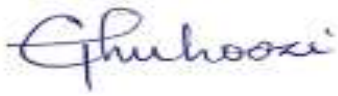
I the undersigned declare that this is my research dissertation and is my original work and that it has never been presented anywhere else for any academic endeavour and that any other material used herein has been duly acknowledged as references.

Kikonyogo Robert

Sign: …… **Date:** ……

APPROVAL

This is to certify that this dissertation has been done under our supervision and is now ready for submission to be examined.

Sign: 

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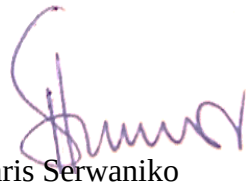
Sign: 

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DEDICATION

I would like to dedicate this dissertation to my wife Prossy Nakattudde, my mother Nakayiza Cissy, Sisters Nankya Angel, Nakazzi Damalie, Namubiru Phionah and Brother Derrick Mutebi.

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LIST OF ACRONYMS

AR	Action Research
DVD	Digital Optical Disc Storage
FW	Future Workshop
ICT	Information, Communication Technology
ITEK	Institute of Teacher Education Kyambogo
KYU	Kyambogo University
KELMS	Kyambogo University E-Learning Management System
LAN	Local Area Network
LMS	Learning Management System
MVP	Master of Vocational Pedagogy
NORHED	Norwegian Support for Higher Education
PAR	Participatory Action Research
UNISE	Uganda National Institute of Special Education
UPK	Uganda Polytechnic Kyambogo
VET	Vocational Education and Training
WBT	Web Based Training

ABSTRACT

Kyambogo University (KyU) a second biggest public University in Uganda has adopted Learning Management Systems (LMS) customised as Kyambogo University E-Learning Management System (KELMS) towards teaching and learning enhancement at the University. Action research was conducted which aimed at "Improving the use of digital literacy by teaching staff at Kyambogo University on the E-Learning Management System (KELMS): a case of master's Degree in Vocational Pedagogy (MVP)". To achieve the aim of the research, research objectives are centred on: analysis on KELMS use, factors affecting KELMS use, implementation and evaluation of the interventions. The study used a qualitative research design and purposive sampling to select the respondents from MVP community (Cohort VII students, facilitators/lecturers, mentors and administrators). The methods of data collection include; interviews, observation and focus group discussions among others. The data collected was then transcribed, coded and presented under themes following the research objectives. The findings show that administration is the key factor amongst digital illiteracy. The interventions include among others; introduction of LMS to new facilitators, mentors, MVP students, lead researcher ensures KELMS is used in all MVP facilitation. The results on impact of improving the use of KELMS in teaching and learning processes reveals that digital illiteracy affect use of KELMS in teaching and learning processes. To that effect, it is strongly recommended that students, facilitators and mentors should have continuous hands on training on LMS to acquire practical skills. MVP administration should digitalise all teaching content and be accessible via online and make sure that LMS is included on timetable so that every week there is facilitation on LMS so that skills acquired are practiced.

CHAPTER ONE: INTRODUCTION AND BACKGROUND

1.0 INTRODUCTION

This chapter presents background on vocational education, personal introduction, situational analysis, motivation statement, statement of the problem, research questions, purpose, objectives, scope, justification of the study and significance of the study and finally operational definition.

1.1 Background of Vocation education and Vocational pedagogy

According to Cornford (2005), Vocational Education and Training (VET) prepares individuals for a vocation and so it is directly linked with a nation's productivity and competitiveness (CEDEFOP, 2011). Most literature generally considers that the concept of Vocational Education and Training (VET) is restricted to non-University training. Gone are the days when vocational training was confined to certain professions like weaving, radio technician, tailoring and motor vehicle mechanic, the horizon has however expanded with time. Today, a wide range of job functions such as telecommunication, information communication and technology, tourism management, fashion and design, food and beverage management, among others all subscribe to vocational training.

Nilsson, (2010) and Sinha (2013) pointed out that Vocational Education and Training was an engine for economic growth and vehicle for social inclusion through its capacity to improve per capita income through self-employment, general service delivery and additional gross domestic product. According to Barber (2003), skills acquisition takes place in society largely through on-the-job training that may or may not result in recognized qualifications (Tamkin et al, 2004). I agree with Barber especially when an electronic technician is exposed to electronic machine maintenance at place of work he/she will be exposed get hands-on knowledge and experience. During the process, different methods, approaches, styles and tools are employed to ensure that learning takes place and validation of learning outcomes is achieved by the learners' capacity to respond to specific outcomes as may be required for a unit or a qualification as classified under the National qualifications' framework.

The education system therefore, has provided further to credit and appreciate possession of employable skills irrespective of where one has undergone training by issuing a workers' pass that precisely spells out one's potential for practice in the labor market.

Loyalk et al (2013), asserted that to effectively build human capital to promote and sustain economic growth, it is critical to most developing countries. A number of developing countries Uganda inclusive currently have identified vocational education and training as a way out. There is increasing interest in VET among policymakers; however, there is little evidence from developing countries as to whether vocational high school, especially in comparison to academic high school, helps students acquire specific and general skills. Although VET is an ideal way to acquire specific skills it should be supplemented with general or life skills if we are to attain sustainable economic growth. The International Literature shows that a solid foundation of general and cognitive skills for example, in math, reading and science helps employees succeed in the workplace (Jerald, 2009). Similarly, (Tyler, Murnane, and Willett, 1995) observed that the mastery of general skills has been shown to have a significant and long-term impact on the wages of high school graduates (Grodsky, 2008). I agree with this assertion, because of mastery of general skills can certainly attract high pay as talent is a critical source of competitive advantage, therefore securing and training the right talent is key to tomorrow's success. Often, companies can't find the right workers who have the right skills at the right time and human resource (HR) departments face the difficult task of finding people who can help the organization reach its strategic goals.

Furthermore, the labor market consistently adjusts to technological innovations and impacts on the job stability for individuals as well as economic stability for countries. This calls for lifelong learning, which is dependent on a foundation in general skills (Kezdi, 2006). VET is a catalyst in the shift towards a knowledge intensive and practicing economy. The benefits of vocational education and training, 2011) adds that by 2020, almost all jobs will require a medium-level qualification that will often be achieved by some form of VET. Thus, the need to acknowledge the transformation in attitude towards VET over the years in training job creators by the beneficiaries of education.

It is worth noting that the paradigm shifts within the BTVET plan for sustainable and resourceful appropriate budget allocations to VET, collaborative training programs amongst institutions and world of work, and a dynamic curriculum development process, citizen sensitization and vocational teacher development programs (Fellow, 2001/2002).

1.1.1 Background to the study

The background to the study is divided into four sub-sections: significance of digital literacy followed by Vocational Pedagogy as a field of study, the historical perspective and finally, the presentation of the situation analysis at KyU.

1.1.2 Significance of digital literacy as part of vocational education in technical institutes and Universities.

Digital literacy means having the skills you need to live, learn, and work in a society where communication and access to information is increasing through digital technologies like internet platforms, social media, and mobile devices (Western Sydney University, 2020). Digital literacy is the knowledge, skills, and behaviors used in a broad range of digital devices such as smartphones, tablets, laptops and desktop PCs (Western Sydney University, 2019). Digital literacy helps to support everyone in day-to-day life at school, university, home and society. It provides a foundation for information transfer as quickly as possible, transfer of knowledge through digital learning platforms, such as learning management system. Learning management system is an online system that provides a variety of assessment, communication, teaching and learning opportunities (Bohlander and Snell, 2009). This dissertation focuses on LMS platform available at KyU: case of MVP programme. Digital literacy is the ability to use information and communication technologies to find, evaluate, create, and communicate information, Digital illiteracy is when one lacks the competencies required for full participation in a knowledge society. It includes lack of knowledge, skills, and behaviors involving the effective use of digital devices such, as smartphones, Ipads, tablets, laptops and desktop PCs for purposes of communication, expression, collaboration and advocacy. Therefore, digital literacy has been increasingly debated and discussed since the publication of Paul Gilster's seminal Digital Literacy in 1997.

1.1.3 Vocational Pedagogy as a field of study

Vocational Pedagogy is a field of study oriented towards trades, occupations and professions. A large part of vocational pedagogy is based on understanding the relationship between learning in school life and learning in work life. The programme largely promotes action-oriented and interactive research, where social research for change and the simultaneous creation of valid social knowledge. The purpose of the program is to strengthen capacity in higher education institutions to contribute to a better qualified workforce, increased knowledge, evidence-based policy and decision making and enhanced gender equality.

1.1.4 Contextual Background

Kyambogo University is a relatively new University created with the aim of promoting and advancing knowledge and development of skills in Science, Technology and Education and such other fields having regards for quality, equity, progress and transformation of society. The vision of the university is to be a centre of academic and professional excellence.

Kyambogo University (KyU) is Uganda's second largest public university established by the Universities and other Tertiary Institutions Act 2001. It is a merger of former Uganda Polytechnic Kyambogo (UPK), the Institute of Teacher Education, Kyambogo (ITEK), and the Uganda National Institute of Special Education (UNISE). Kyambogo University is the second largest university in Uganda with enrollment of more than 30,000 students on-campus.

Kyambogo University (KYU) was established with the main aim of promoting and advancing knowledge and development of skills in Science, Technology and Education and such other fields having regards for quality, equity, progress and transformation of society.

The University that now sits on Banda Hill is one of Uganda's largest public Universities established by the Universities and Other Tertiary Institutions Act 2001 and the Universities and Other Tertiary institutions (Establishment of Kyambogo University) instruments of 2003.

Uganda Polytechnic Kyambogo – (UPK) started in 1928 as a small technical school on the Makerere Hill and was transferred to Kyambogo Hill in 1958 as Kampala Technical Institute. It was renamed Uganda Technical College and finally Uganda Polytechnic, Kyambogo (UPK).

Institute of Teacher Education Kyambogo (ITEK) with a motto "NOTHING WITHOUT LABOUR" started as a one-roomed Government Teacher Training College (GTTC) in 1948 in Nyakasura, Fort Portal and transferred to Ruharo and then Ntare Hill all in Mbarara, western Uganda in 1949 and 1950 respectively. After about four years it had to be moved to Kyambogo hill due to the projected high numbers of students. It is clear that in 1952 the then Director of education proposed the foundation of a Central Government Teachers Training College at Kyambogo to produce a new type of teachers with practical training in handcraft. Regarding the choice of the Site at Kyambogo, it was advantageous to have the CGTTC near the new Kampala Technical College. In fact, it was to become the Uganda Institute of Education. It transformed into a National Teachers College in 1965 to start handling Diploma Courses. The creation of new NTCs around the country in the mid-1980s created room for the Institute to concentrate on programmes for Teacher Trainers through in-service degree programs. In Sept 1987, the then principle of ITEK wrote to the Minister of Education to indicate that the institute was ready to take on Bachelor of Education (B.Ed) degree courses for the 1987 intake for in-service students. The Institute of Teacher Education Kyambogo was finally legally born following the passing of the Institute of Education act. 1987 which made ITEK an autonomous institute for the first time.

Uganda National Institute of Special Education (UNISE) on the other hand started as a Department of Special Education at ITEK in 1988 and later became an autonomous institution by act of parliament in 1998. The three institutions were merged to form Kyambogo University, the third public university to be established in Uganda (Adupa & Mulindwa, date)

Although Kyambogo is a new university, it has a rich history that dates as far back as 1928. As mentioned earlier KyU is an amalgamation of former ITEK, UNISE, and UPK and it was faced with array of challenges in delivering knowledge and services to the students. These challenges made the university come-up with innovations to solve them. One of the solutions was to introduce Information Communication and Technology (ICT) platform. The term, information and communication technologies (ICT), refers to forms of technology that are used to transmit,

store, create, share or exchange information. This broad definition of ICT includes such technologies as: radio, television, video, Digital Versatile Disc (DVD), telephone (both fixed line and mobile phones), satellite systems, computer and network hardware and software; as well as the equipment and services associated with these technologies, such as video-conferencing and electronic mail. ICT in education means teaching and learning with ICT.

Researchers globally have proved that ICT can lead to improvement of students' learning and better teaching methods. A report made by the National Institute of Multimedia Education in Japan, proved that an increase in student exposure to educational ICT through curriculum integration has a significant and positive impact on student achievement, especially in terms of "Knowledge Comprehension", "Practical skill" and "Presentation skill" in subject areas such as mathematics, science, and social study. While we recognize that the use of instructional technology in the higher education teaching and learning processes, it is still in its infancy in Uganda, instructional use of ICT is vital to the progress and development of faculty and students alike. Higher education institutions, have adopted ICT as a means to impart to students the knowledge and skills demanded by 21st century educational advancement (Oye, 2012).

MVP is one of the Master programmes in Kyambogo University which has adopted the use ICT in facilitation of its course units. All the plenary presentations for example are done by use of overhead projectors, all MVP students are availed with laptops for carrying-out their research project and also to access online tutorials to supplement their learning processes. KyU like any other universities, in a bid not to lag behind in the use of ICT, it has gone ahead to adopt learning management system (LMS), innovation that will see better method of delivering teaching and learning. From the ICT infrastructure at KyU, e-Learning is one of the steps the University is implementing to take classroom learning and teaching to online platform.

1.2 Situational analysis

A situation analysis was carried out to determine areas for improvement in LMS usage particularity. In the area of teaching and learning processes, two approaches were used for the situation analysis namely; that is work process analysis and future workshop.

Situation analysis is a systematic collection and evaluation of past and present economic, political, social and technological data, aimed at identification of internal forces that may influence the organization's performance and choice of strategies, and assessment of the organization's current and future strengths.

A situation analysis done with the stakeholders revealed that there was no resident KELMS administrator at MVP, fear to use technology, poor KELM infrastructure, poor follow-up, inadequate LMS training, poor perception, administration reluctance to implement KELMS, poor ICT usage skills, poor internet connection despite vast amounts of investment on ICT equipment.

According to (Independent Newspaper, 23rd June 2020), Dr. John Okuonzi, the Director of Information Communication and Technology at Kyambogo University told the Independent Newspaper of 23rd June 2020 that "Management approved the decision to invest in online learning platforms after realizing that the Covid-19 pandemic may take long to warrant face to face learning, the 400 million Uganda shillings will be spent on training lecturers how to use online tools, purchase online teaching equipment and induct students, unlike other universities which have developed independent Learning Management Systems-LMS, Kyambogo will use Google classrooms and meeting platforms" Dr. Okuonzi told URN that the ICT Directorate was working with faculties, schools and heads of departments to organize an intensive training program for teaching staff and induct students to use the online tools for teaching and learning (Dr John Okuonzi, 2020).

The researcher carried out work process analysis on the KELMS management, interviewed key informants and students, organized focused group discussions and made observational strategies. He identified the work process activities, tasks involved and competences required to facilitate and learn over KELMS. The activities involved in imparting knowledge to learners were identified during situational analysis as: Administration and orientation; Teaching and learning process, assessment and evaluation of students in order to bring up competent KELMS user as shown in table 1.1.

Work Process Analysis

Table 1:1 Work process analysis in the production of LMS User

Work process	Tasks involved	Competence required
University Admission	▪ Answers questions about the University ▪ Communicate with new students ▪ Evaluates potential applicants ▪ Guidance for students ▪ Joint Admission Board Selection of learners. ▪ Maintain appropriate records, including details of student enquiries, applications, interviews ▪ Publishing names of successful applicants on the notice board. ▪ Recruit Students ▪ Issue out of admission letters. ▪ Registration of new learners. ▪ Interpretation of University rules and regulations ▪ Introduction of staff and students leaders to the new entrants.	▪ Administrative skills. ▪ Analytical skills ▪ Carrier guidance skills ▪ Good communication skills ▪ Interpersonal skills. ▪ Records management skills. ▪ Secretarial skills ▪ Social Media Skills ▪ Use of Information and Communication Technology (ICT) skills
KELMS Teaching and learning processes	▪ Actual teaching and learning ▪ Planning ▪ Preparation of instructional materials (T/L aids) ▪ Preparation of lesson notes ▪ Preparation of schemes of work and lesson plans	▪ Communication skills ▪ ICT skills ▪ Interpersonal skills ▪ Knowledge of the subject matter ▪ Management skills
Assessment and evaluation of learners	▪ Class work assignments ▪ End of course exams ▪ Final projects	▪ Communication skills ▪ ICT skills ▪ Knowledge of the subject

	▪ Formative assessment ▪ Learners feed back ▪ Mid-term tests ▪ Observations ▪ Projects assignments ▪ Set test items ▪ Summative assessment-at the end of an instructional unit	content ▪ Professional ethics ▪ Time management skills

1.2.1 Motivation for undertaking the study

The researcher is a Website Assistant/ICT Technician who designed the Kyambogo University website, whose major role is to maintain and update the KyU Website, E-mail Directory, conduct ICT practical's for students, provide ICT technical support to students, staff members and do maintenance of all ICT equipment in the University. The researcher has served the University for over 9 years and performs tasks diligently with the purpose of inculcating up to date competences and improving the training among students. Considering the objectives and concerns of the University, my interest is to improve the delivery of instruction using LMS to foster innovations and development.

Through MVP modules in Vocational Action Research Methods, curriculum development, implementation and evaluation and research expeditions, the researcher is endowed with the competence to facilitate stakeholders to organize and participate in Future Workshops (FW) as platforms where they could identify challenges, air out their views justifiably and come up with agreeable implementable interventions to improve situations. The researcher is further motivated as participant through action research approach, which makes it possible for him to implement his idea as an agent of change.

1.2.2 The Future Workshop Procedures Carried

The Future Workshop (FW) was planned and carried out on the 22nd February 2019 from 1:00 p.m. – 5:00 p.m. from Computer Centre. FW was used as research tool at this point to identify gaps and lay out possible strategies for improving the situation of Kyambogo University E-

learning Management System (KELM) use for effective teaching and learning tool. It is made of five phases namely: the planning phase, critique phase, utopian phase, reality phase and follow-up phase. During the future workshop, only four phases were critically observed notably; preparation phase, critical phase, utopian/fantasy phase and reality phase.

1.2.3 The preparation phase

During the preparation phase, researcher identified and invited the stake holders, purchased the writing materials (Pens, papers, markers and manila papers).

Future workshop (FW) developed by Robert Jungk (1970); is a method that enables a group of people to develop new ideas or solutions when working, for instance, with social problems.

A future workshop was organized together with the stakeholders so as to discuss the challenges faced during the use of KELMS to facilitate teaching and learning process.

The researcher organized a meeting before a call for FW. Stakeholders who attended this meeting included MVP program administration, Facilitators/lecturers, ICT KyU staff, MVP Cohort 7 Students and LMS administrators. This meeting was important to determine who were to be invited as stockholders, methods, time schedule, rules and regulations to guide the FW session. The aim of organizing FW was to: improve the usage of KELMS at MVP.

The future workshop was conducted on 22nd February 2019 date was chosen as day for holding the FW meeting and time was between 1:00 p.m. to 5:00 p.m. and the venue agreed was Computer Centre. It was important that the future workshop was organized, because the researcher had no idea. He came with haze ideas which gathered during work process analysis into the FW meeting. Following critical analysis, the gaps resulting to poor KELMS use was discovered. These gaps were attributed to the fact that there was poor will for administration to enhance use of KELMS; or lack of KELMS administrator at MVP. Through a future workshop, solutions to the challenges and allocation of responsibilities were awarded to different participants to perform so as to cause change. According to Apel, (2004) futures workshop is the technique used to shed light on a common problematic situation, to generate visions about the future, and to discuss how these visions can be realized (Elkins, 2009). This study took on a futures workshop method as opposed to other methods of problem analysis because it is

democratic and provides a platform where all participants in the teaching-learning process contribute their ideas freely.

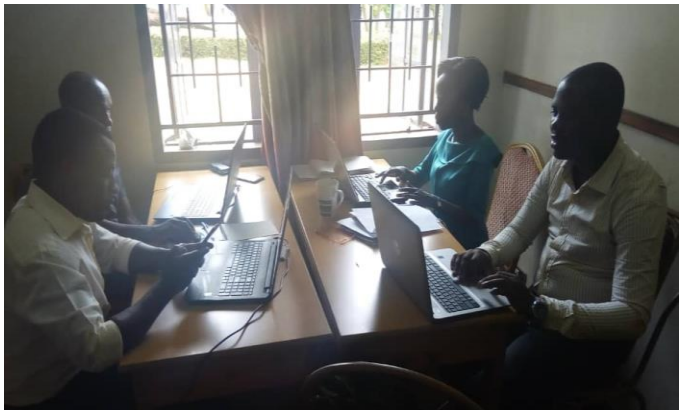
The Workshop went through typical phases namely; preparation, critique, fantasy/ utopia and reality. In the preparation phase, the researcher identified participants and formally invited them to the workshop by email and phone text SMS. Participants were Cohort Seven students, facilitators, mentors and both KELMS and KyU administrators. Other activities included preparation of the workshop venue and materials. During the critique phase, practical skill acquisition was introduced to the participants for brainstorming.

Stakeholders: Facilitators, mentors, ICT KyU staff, MVP and LMS administrators and students (Cohort Seven) attentively listening on procedures of identifying problems and action research process.

1.2.4 Critique phase

Critique phase provides a thorough and critical investigation of the challenges such as poor administration, poor attitude, digital illiteracy and external factors which were identified. The challenges were subjected to section where a pair wise matrix was used to rank them in order to identify the most pressing one. This is done through a visualized brainstorming of the problem. The challenges were identified, visualized, categorized, documented and prioritized. Digital illiteracy was ranked most pressing in using KELMS, then the other challenges could simply be a walkover with a knowledgeable and consistently practicing KELMS use.

Figure 1



Primary Source: NOMA House I plenary

Figure 1: Stakeholders engaged in group discussions

This led to findings presented in table 1:2 below: **Through brainstorming data was collected by structuring and grouping of ideas into main sub-themes.**

Participants' generated ideas store while observing the rule of thumb as the guiding principles – first idea generation, no criticism, and respect for everyone's idea, short responses and combination of ideas permitted.

Table 1.2: Summary of the challenges identified in the critical phase of the FW

SHORT TERM	MEDIUM TERM	LONG TERM
▪ Little knowledge on ICT for students ▪ Poor perception ▪ Poor technical support ▪ No link between training and practice for mentors, students and facilitators ▪ Communication gap ▪ No content ▪ Unusual experience ▪ Poor attitudes towards use of technology in teaching and learning ▪ No schemes of work and lesson plans ▪ Unusual experience ▪ Lecturers do not upload their course into the KELMS ▪ Poor implantation	▪ No resident KELMS administrator at MVP ▪ Not practically assessed ▪ Requires lots of time ▪ Indiscipline among learners ▪ Fear to use technology ▪ Inactive course leaders ▪ Poor KELMS infrastructure ▪ Poor local technical support ▪ Bureaucratic administrators both (KELMS and MVP)	▪ External factors - Change internet Scriber Provider - Procure modern ICT equipment at MVP - Collaboration with international organization in the area of LMS.

▪ Digital illiteracy among lecturers, mentors and students ▪ Inadequate training on KELMS ▪ Poor follow-up		

The above identified gaps were arranged starting from the most critical ones up to the least ones. Coding was done to show major challenges that can be easily solved without resources as shown in Appendix 4. Challenges were arranged in order according of critical ones (as shown from numbers) and coding was done according to numbers 1 (short term), 2 (medium term) and 3 (long term). Therefore, this action research focused on category 1 (short term). This was because, this category required short time and require minimum or no resources. The major challenges under short term were fantasied in order to generate solutions of which details are presented in table 1:3.

1.2.5 The Fantasy phase

During the fantasy phase, which is sometimes referred to as Utopian stage; participants turn all challenges or negative from the critique list into positive in forming the goal. It also suggests ways or solutions to get to the goal excess. During this stage, participants were free to record, photography and note taking. The social fantasies of the participants are developed in this phase allowing them to liberally dream big.

It should be noted that; participants tried to work out Utopian solutions without any restrictions as shown in Table 1:3. Stakeholders generated ideal solutions which could be implemented without resources.

Table 1.3: Fantasized solutions

	Solutions
Digital literacy	▪ Allocate time for LMS trainings for Mentors and Facilitators ▪ Conduct one on one trainings on LMS with those mentors interested ▪ Facilitation/trainings on LMS for the mentors/lecturers to enable them use LMS ▪ ICT trainers are ready to train the students and lecturers/mentors ▪ Individual trainings ▪ Need for experiential learning from world of work ▪ Practical examination of LMS so as to improve interest in students ▪ Those interested can go on and learn by themselves ▪ Trainers or support staff should direct what to do or not to do for the person who has a challenge with their computers ▪ Training (capacity building) for mentors and students ▪ Use of SMS and LaserJet printers through (rudimentary)
Administration	▪ Allocate time for LMS trainings for Mentors and Facilitators ▪ Contact internet providers like RENU, NITA-U, MTN, Airtel etc. to provide better internet bandwidth with fast internet speed ▪ Follow-up (strict) of the works on LMS for student's assignments or a directive that after the deadline on LMS has passed there should be no hard copy and online deadlines has passed

	▪ Improvement in the infrastructure and technical support ▪ Make the LMS as hands-on subject examination for MVP ▪ Mentors need facilities to enable them use technology internally and externally ▪ Organize for experiential learning from world of world experts ▪ Practical examination of LMS so as to improve interest in students ▪ University policy that every lecturer must put his/her coursework online
Attitudes	▪ Allocate time for LMS trainings for Mentors and Facilitators ▪ Conduct one on one trainings on LMS with those mentors interested ▪ Facilitation/trainings on LMS for the mentors/lecturers to enable them use LMS ▪ Individual trainings ▪ Practical examination of LMS so as to improve interest in students ▪ Reward System to mentors ▪ Those interested can go on and learn by themselves ▪ Enforce the University policy that every lecturer must upload coursework on LMS

1.2.6 Reality phase

This is stage where evaluation of the "idea store" starts focusing on the most realistic ideas or solutions under the circumstances.

Participants generated ideas while observing the rule of thumb as the guiding principles - first idea generation, no criticism, respect for everyone's idea, short responses and combination of ideas permitted. Together with the stakeholders, gaps were identified; visualized and possible

strategies to fix the causes of the challenges identified were suggested in the FW. Many critical points were generated and categorized into short term, medium term and longterm challenges as follows:

Short term: Administration support; though infrastructure support is imperative, KyU especially MVP always come up with good intentions to support use of KELMS. It normally does not last long when they abandon the idea for students, mentor or facilitators to use KELMS to facilitate teaching and learning. Furthermore, digital illiteracy, administration and poor attitude factors are among other issues that contributed to poor use of KELMS due to lack of pedagogical skills.

Medium term: During the future workshop meeting with all the stakeholders it was pointed out that MVP should consider recruiting KELMS administrator who should be resident at MVP department.

Long term: Rewards to student who use KELMS, MVP administration will consider motivating factors that are relevant to facilitators and mentors when creating MVP development program that supports their needs. As noted in the findings of this study, salary, responsibility and achievement are the prominent factors that MVP considers important when considering the motivation factors that influence their decision to adopt a learning management system into their instructional practices. MVP staff development program should provide monetary stipend, reinforce MVP staff responsibility to teach and help them achieve their goals and advance their knowledge of teaching using a KELMS.

This is the ideal situation and together with the stake holders, we agreed to zero on short term challenges since they did not require a lot of resources to be implemented. We decided to use pairwise matrix ranking (Appendix 7) to get the most pressing challenge. Using pairwise matrix, we ranked the problems and administration came topmost ranked as 1st and followed by digital illiteracy for both students and mentors or facilitators as pressing issues responsible for poor KELMS use to facilitate teaching and learning at KyU. It was against this background that we zeroed on: “improving the KELMS to teaching and learning tool” as being the most pressing challenge and needed to be addressed with immediate effect. The other pressing short-term problems acted as our objective store in mitigating the identified gaps so as to improve use of KELMS at KyU by students, and facilitators.

1.2.7 Implementation of Action Research

In the Implementation phase (stage 4 of the future workshop) stakeholder's implemented solutions following an action work plan. This is supported by psychologists like Walton who asserts that, feeling that you are part of the team can spur you to take on tasks (Walton, 2014). In this study, the roles of students, facilitators and administrators were clearly agreed upon and my role as a researcher was to follow up on action implementation by the responsible persons and track on what is being implemented and what is not working well.

In the Reality/Implementation phase (stage 4), stakeholders agreed on how solutions were to be implemented, when and by who (Walton, 2014). The roles of students, lecturers and administration were clearly agreed upon and my role as researcher was to follow up on the issues to be observed within seven months.

The implementation phase was characterized by checking and evaluating ideas found in the fantasy phase leading to what concerned their practicability. The data obtained were used to make an action plan.

The study being cyclical in nature, was concluded with the reflection and re-planning phase. Interventions were identified and reflected upon and the ways to improve the current situation were noted for further intervention. In this phase, the sequence of activities that were performed included working out an action plan, implementing action points, follow-up (reflection), evaluation, and re-planning where it was found necessary. During this phase, data about the progress of the project was documented using an observational checklist, a pen, journal, camera, audio-visual recorder as tools to record sequence of events as they unfolded. Information gathered was helpful for individual and team players' reflection. Results were used to execute desirable changes to re-plan or improve situations. Techniques for observation were continuously used, Responsible persons (team players) formed focus discussion groups to reflect and discussed on reports on the effects of the changes observed during the implementation of their respective assigned tasks.

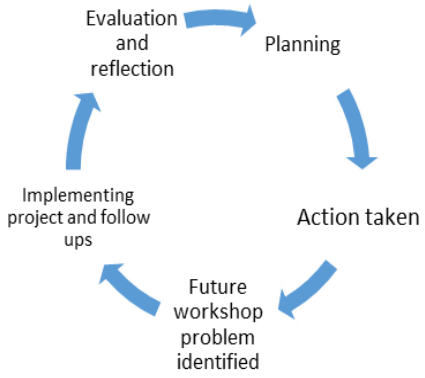
1.2.8 Follow up on implementation of action work plan

Follow up and monitoring was conducted on the KELMS use by mentors, facilitators, students and administrators to find out if there was any change and improvement exhibited within the timeline of the action research from November 2017 to August 2018. In addition to that, evaluation was conducted to determine the success or failure of the Future Workshop to solve the problem, recommendations are made, and the next course of action taken (details in chapter 4 and 5).

Research method employed was Action Research, which is a cyclic process. Whitehead & McNiff, 2006 affirmed that an action research process is often described as a recurring spiral of planning, doing, observing (or evaluating) and reflecting, in order to generate positive change. Therefore, since action research is a continuous cycle, through evaluation we can determine whether the problems were minimized (Stringer et al, 2010). Evaluation process revealed that some of the gaps that were identified during future workshop were minimized. However, recommendations that were identified at the end of this research need reflection so as to plan for another future workshop again; to come out with possible solutions. Once it is solved, we cannot relax but we continue to reflect on other problems through observations and start planning again until when the workplace is problems free. This experience has enabled me acquire competence in working with the community on how to identify problems and solutions to such existing problems through conducting future workshop with stakeholders. Therefore, the previous knowledge and experience has enabled me employ action research as an approach in carrying out this study.

The workshop was conducted to evaluate the research study, validate results and information was disseminated. Stakeholders were involved in all activities as supported by (Meyer, 2000) who maintains that action research strength lies in its focus on generating solutions to practical problems and its ability to empower practitioners', by getting them to engage with research and the subsequent development or implementation activities (Koshy, 2011).

Figure 2. Processes of action research undertaken in the study at MVP



Secondary Source: Action Research Cycle (adapted from Kemmis and MC Taggart, 1982).

1.3 Statement of the problem

Following the discussion from both the future workshop and the work process analysis process, it is evident that Kyambogo University has significantly invested in the use of ICTs through the Ekampus initiative to improve efficiency in digital use and application in the teaching and learning process. Although this infrastructure is in place, findings from FW indicate that the digital competence among lecturers/facilitators and its application through KELMS is still wanting. Digital literacy gap was vividly identified during the FW that it affected the teaching and learning processes causing undesirable effect on students, lecturers, mentors/facilitators and administrators respectively. The study therefore, is in quest to improve facilitators skills through development of a curricular (training manual) that enables them acquire competencies in KELMS for better implementation within various departments.

1.4 Purpose of the study

The purpose of the study is to strengthen the digital literacy among teaching staff to improve the usage of Kyambogo E-learning Management System (KELMS) to support teaching and learning process.

1.5 Objectives of the Study

i. To design appropriate strategies to improve usage of KELMS and digital literacy.

ii. To implement the developed strategies.

iii. To evaluate the strategies aimed at improving the use of KELMS to support teaching and learning processes.

1.5.1 Research questions

i. What strategies can be used to improve digital literacy and the use of KELMS at KyU?

ii. How can the identified strategies be implemented to improve usage of effectiveness of KELMS to facilitate digital literacy to improve teaching and learning processes?

iii. How can the intervention strategies in improving usage of KELMS to facilitate teaching and learning be evaluated?

1.6 Justification of the study

Web Based Training (WBT) and its newer and more general synonymous term e-Learning are two of today's buzz-words in the academic world. Decision-makers associate with its new ways of learning that are more cost efficient than traditional learning strategies. It allows students to better control the process of learning because they can decide when, where and how fast to learn. The emergence of e-leaning has tremendously transformed information – handling and management in academic environments (Ani & Ahiauzu, 2008). A number of e-learning initiatives have been put in place to assist in the development training and use of electronic resources in a number of academic institutions. However, information gathered from document review, future workshop and focus group discussions with stakeholders revealed that gaps in use of KELMS for teaching and learning at MVP existed. Therefore, this study was needed to establish and resolve the factors that were responsible for the challenges that affected use of KELMS at MVP.

1.7 Significance of the Study

This study will be of value to the TVET institutions, Higher Learning Institutions, MVP programme graduates, mentors, facilitators and MVP programme administrators who may be able to attain the required digital skills and competences to enhance teaching and learning processes. In addition, teachers may have the opportunity of using action research to explore

common problems encountered in use of KELMS to teaching and learning processes with the purpose to bring about change.

Furthermore, according to (Parkin, 2009), involving the stakeholders in the action research process which is collaborative, investigative and participatory provides opportunity to work together to identify common problems, design action plan and find solutions, follow up to see observable changes or improvement on the problems raised.

The study contributed to the body of existing knowledge pertaining to teaching and learning. On the other hand, the information generated by this research might serve as source of literature for future researchers.

1.8 The Scope of the Study

The scope highlighted the geographical location, content and the time frame for the study.

1.8.1 Geographical scope

The study was conducted at the Computer Centre and NOMA House, Kyambogo University (KyU). KyU is situated East of Kyambogo; approximately 10 kilometers from Kampala Uganda's capital city.

1.8.2 Content scope

The study is based on the three research objectives. The first objective is to design appropriate strategies to improve usage of KELMS and digital literacy. Objective two is to implement the developed strategies. The third objective focused on evaluating the strategies aimed at improving the use of KELMS to support teaching and learning processes.

1.8.3 Time scope

The study addressed administration, digital literacy and attitude factors which was affecting use of KELMS. It also covered the time when the key stakeholders identified gaps in implementation of KELMS at NOMA. The key concerns identified were: administration, digital illiteracy, attitude and external factors on use of LMS by MVP students, facilitators and mentors. The researcher together with stakeholders at the time of Future Workshop suggested to have the

first cycle of action research on this topic to cover the period from October, 2018 up to August, 2019.

1.9 Definition of operational terms

Action research: According to (Lingard et al, 2008) action research is also known as participatory action research, community-based study, co-operative enquiry, action science and action learning. It is an approach commonly used for improving conditions and practices in a range of environments.

Learning Management System: A learning management system (LMS) is a software application for the administration, documentation, tracking, reporting and delivery of electronic educational technology (also called e-learning) courses or training programs.

Teaching: is the deliberate intervention that involves planning and implementation of instructional activities and experiences to meet intended learner outcomes according to a teaching plan.

Learning: According to Wenger (1998) learning is defined as a relatively permanent change of experience in an individual's behavior (knowledge, skills and attitude) that can occur at any time or place as a result of conscious.

Teaching learning process: It is the most powerful instrument of education to bring about desired changes in the students.

Vocational Pedagogy: Is workshop learning and learning in working life. It is not teaching but learning that is at the centre of vocational didactics (Nilsson, 2000). Nilsson argues that in order to understand what it is that creates good learning situations arise and change for teachers, and how progress occurs, one must study more that the content of the teaching.

CHAPTER TWO: LITERATURE REVEW

2.1 Overview

This chapter presents the theoretical underpinning, related literature reviewed from various scholarly materials to the two main objectives of action and reflection. Related literature for evaluation is based on three main gaps identified during the future-workshop namely, digital illiteracy, administration and poor attitude which affect effective use of KELMS at KyU.

2.1 Theoretical perspective

Driscoll (2000) defines learning as "a persisting change in human performance which come about as a result of the learner's experience and integration with the world" (Siemens, 2005). I may add that learning is a process where an individual interacts with the environment to acquire new knowledge to get experience.

Literature provides numerous learning theories employed by vocational and technical education researchers to explain the learning processes with the aim of improving teaching. Among the common theories are the:- behaviorist, cognitive social learning, psychodynamic, and humanistic learning theories. According to (Dario et al., 2006) the behaviorist model involves a teacher-centered approach in which the educator's role is to manipulate the environment for students to elicit a specific response. Behavioral change in a desired direction is the main goal of this learning orientation. For the cognitive theorists, knowledge acquisition is a mental activity involving internal coding and structuring by the learner and suggests that learning happens best under conditions that are aligned with human cognitive architecture. It is further suggested that instruction should be based on a student's existing mental structures or schema to be effective (Yilmaz, 2011).

While the aforementioned theories provide an understadinng of learning, the environment is equally improtant in determining which theory best suits a particular circumstance. Learning that takes place in general education differs from that of Vocational and Technical Education setting.

Learning management system has become nearly ubiquitous in the modern college experience and essential elements of the modern college expereince. KyU, like other higher inistitutions of

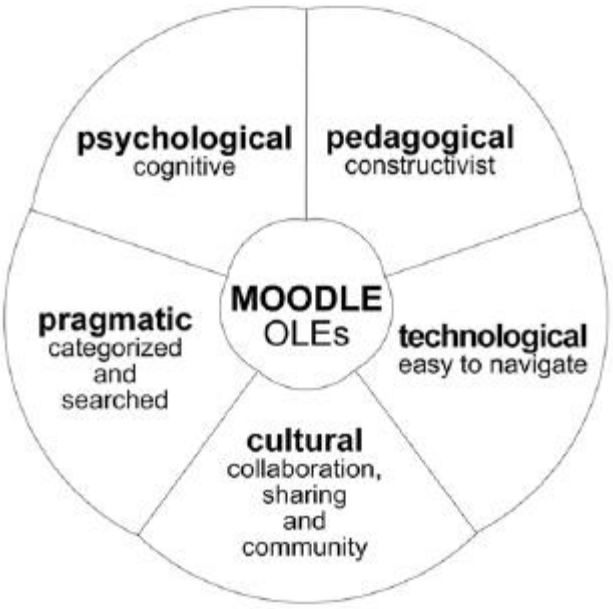
learning is moving towards use of LMS to faciliate most of the course units using the platform. This needs patiences and effort to achieve the dream. The introduction of learning management systems, along with increased use in the home and in business has brought an increasing number of students and teachers to the online learning enviroment (Favvo & Johnson, 2007).

A learning management system (LMS) is a software application or web-based technology used to plan, implement, and assess a specific learning process. Typically, a learning management system provides an instructor with a way to create and deliver content, monitor student participation, and assess student performance online. The LMS may also provide students with the ability to use interactive features such as threaded discussions, video conferencing, discussion forum, blogging on topics of one's passion and messaging. LMS is also called Course Management System, or CMS. In the KyU context, Moodle (Modular Object Oriented Dynamic Learning and Environment) LMS has been customized as the Kyambogo University Electronic Learning Management System (KELMS).

According to (Embi, 2011) and (Itmazi & Megias), Moodle is the leading open source in North American and European universities. The main driving factor is the zero implication costs to these higher learning institutions. Other than its free nature, Moodle is attractive because it is much more interactive than the blackboard. Additionally, most courses offered online use Moodle as a supplementary learning tool (Beatty & Ulasewicz, 2007). This is supported by (Martin & Serrano-Fernandez, 2009) who argued that Moodle as LMS has helped to reinforce students' abilities and knowledge. They further concluded that Moodle is the best platform for educators to "organize, manage and deliver contents."

Moodle's function as developer of constructivist (student-centered learning) environment's (Dogiamas & Tylor, 2003) is examined by (Antonenko, Toy & Niederhauser, 2005) through use of a framework developed by (Hannafin & Land, 1997). The framework consists of five components: psychological, pedagogical, cultural, and pragmatic. Fig 5 highlights the five components of these core foundations as applied to the design of student-centred learning environments.

Figure 3. Framework of Moodle in Building Student-Centred Learning environments



The field of education has been affected by ICTs, which have undoubtedly affected teaching, learning, and research (Yusuf, 2006). A great deal of research has proven the benefits to the quality of education (Al-Ansari, 2006). ICTs have the potential to innovate, accelerate, enrich, and deepen skills, to motivate and engage students and facilitators, to help relate school experience to work practices, create economic viability for tomorrow's workers, as well as strengthening teaching and helping schools A great deal of research has proven the benefits to the quality of education change (Davis & Tearle, 1999). As Jhurree, (2005) states, much has been said and reported about the impact of technology, especially computers, in education.

Computers and applications of technology became more pervasive in society which led to a concern about the need for computing skills in everyday life. Hepp, Hinostroza, Laval & Rohbein, (2004), claim in their paper "Technology in Schools: Education, ICT and the Knowledge Society" that ICTs have been utilized in education ever since their inception, but they have not always been massively present. Although at that time computers have not been fully integrated in the learning of traditional subject matter, the commonly accepted rhetoric that education systems would need to prepare citizens for lifelong learning in an information society

boosted interest in ICTs (Pelgrum & Law, 2003). The field of education has been affected by ICTs, which have undoubtedly affected teaching, learning and research (Yusuf, 2005). ICTs have the potential to accelerate, enrich, and deepen skills, to motivate and engage students, to help relate school experience to work practices, create economic viability for tomorrow's workers, as well as strengthening teaching and helping schools change (Davis & Tearle, 1999; Lemke &Coughin, 1998; cited by Yusuf, 2005). In a rapidly changing world, basic education is essential for an individual be able to access and apply information. Conventional teaching has emphasized content. For many years, courses have been written around textbooks. Teachers have taught through lectures and presentations interspersed with tutorials and learning activities designed to consolidate and rehearse the content. Contemporary settings are now favoring curricula that promote competency and performance. Curricula are starting to emphasize capabilities and to be concerned more with how the information will be used than with what the information is. However, with introduction of KELMS at KyU few faculties embraced use of the platform to enhance the traditional method teaching and learning. MVP is one of the programmes using the LMS platform to facilitate the learners. It is also important to note that KELMS is embraced regardless of sex or disability status.

2.3 Examining factors affecting use of KELMS as teaching and learning aid

The factors identified involved facilitators, mentors and students' KELMS use and are categorized into four macro groups; administration, attitudes, digital illiteracy and external facilitators.

During the future workshop meeting, administration was top on the list of factors that have contributed to less use of KELMS at MVP to facilitate teaching and learning at MVP. This factor was very important: administrative support, as the system was under implementation at the MVP programme and various organizational, structural, and infrastructural issues inevitably occur. To this research we added the technological aspect, for the same reason, as the system was not fully enhanced to carry-out teaching and learning. However, it is important to note that the most influential factor appeared to be the human factor, namely perceptions and attitudes of three groups of stakeholders: students, mentors and facilitators.

Administrative support is critical to the successful integration of LMSs into teaching and learning processes. Administrators can provide the conditions that are needed, such as ICT policy, incentives and resources. The commitment and interest of the top management and other leaders at every level is the most critical factor for successful implementation of ICTs. According to (Cameron and Ulrich, 1986), a transformational leadership is a leadership that involves a process of fundamental change which is required for the institutions to adapt to changes brought about by the information society. Dwyer et al., (1997) emphasize that for the integration of LMS to be effective and sustainable, administrators themselves must be competent in the use of the technology, and they must have a broad understanding of the technical, pedagogical, administrative, financial, and social dimensions of ICTs in education. These ideas are consistent with international studies in terms of identification of major areas of dissatisfaction and perceptions of quality online teaching and learning (Weaver, Spratt, & Nair, 2008) and the importance of the role of teachers for the successful implementation of LMS (Steel, 2009). For many Ugandan universities, using online learning systems is a new experience and we consider it relevant to study and highlight probable challenges.

Attitude was another gap that was identified that needs to be closed if KELMS is to be improved at KyU. Attitude is a predisposition to respond favorably or unfavorably to an object, person, or event. To successfully initiate and implement educational technology in school's program depends strongly on teachers‟ support and attitudes. Among the factors that influence successful integration of ICT into teaching are teachers "attitudes and beliefs towards technology". If teachers' attitudes are positive towards the use of educational technology, then they can easily provide useful insight about the adoption and integration of ICT into teaching and learning processes. Attitudes towards computers influence teachers' acceptance of the usefulness of technology, and also influence whether teachers integrate ICT into their classroom.

It is important for all stakeholders in the institution to know the existing ICT facilities and services and their importance in relation to their specific tasks. However, according to Tusubira and Mulira (2004), there tends to be some vague knowledge about ICTs, some interpreting them as simply advanced technologies that require a lot of money and very advanced skills. They are not appreciated as a means of creating efficiency and cost-effectiveness. Lack of awareness goes

along with attitude. Positive attitude towards LMSs is widely recognized as a necessary condition for their effective implementation (Woodrow, 1992). Full involvement of all stakeholders in the implementation process is a key to addressing awareness and attitude problem. Formally organized awareness programmes, visits to similar institution where success has occurred, and short trainings can contribute to raise the awareness and change the attitude and perception of stakeholders towards facilities and services.

*Attitudes (positive or negative) comes from society, students, facilitators and mentors themselves and can be made visible in how people perceive e-learning (LMS) as not being 'as good' as face to face teaching. Attitudes can become major challenges for e-learning if not addressed openly (*Gammill et al, 2005). *In the bachelor's degree in information technology (BIT) case attitudes are manifested in the way society, students, facilitators and mentors are questioning the credibility of e-learning courses as such.*

It appears that many academics have poor attitude towards use of ICT platforms such as LMS so as to enhance teaching and learning. Based on the observations, their 'ignorance' can be contributed to factors such as refusal to accept new technologies in teaching and their belief that the LMS will totally replace them. This research argues that these two perceptions can be changed if they are willing to attend the training provided by the KELMS and MVP administration. They were first introduced to the LMS and shown how easy it was to utilize the platform for their teaching and learning purposes. The training starts with opening an account for the LMS, where they are going to visit the LMS itself online.

Attitude is considered as an essential factor influencing language learning. Attitudes are important to us because they cannot be neatly separated from learning. It means that learning and attitudes have relation so that they can influence students' learning process (Carnduff and Reid, 2003, p.33). Similarly, Fakeye (2010, p.206) stated that the matter of learners' attitude is acknowledged as one of the most important factors that impact on learning language. In this case attitude is seen as one of the personalities that affects the learning process. So, the researcher

concludes that attitudes are closely related to learning because attitudes are internal factors that can affect learning

The effectiveness and success of e-learning are determined by the skills and commitment of the instructor, students and mentors. It is believed that the effectiveness of e-learning depends not so much on information technology but on how the instructor, students and mentors makes use of the IT (Collis, 1995). These should be expressed by effectively managing an LMS-based course and by using and encouraging feedback and two-way communication with students and mentors. The next to be emphasized is willingness to adopt new technology (Abrahams, 2010). The adoption of educational technology is a complex issue; often instructors' pedagogical conceptions and values do not include using ICT in educational settings even if technology does not constitute any difficulty for them (Steel, 2009). Consequently, ubiquitous implementation of e-learning is limited by the absence of a holistic view of what should be done to make it effective and resistance to change amongst academic staff (Blin & Monro, 2008; Keaster, 2005). Personal innovativeness and its antipode computer anxiety are therefore another challenge that may be critical for the success of LMS. Personal innovativeness in an information technology context is an individual's attitude reflecting a tendency to experiment with and to adopt new information technologies independently of the communicated experience of others (AlBusaidi & Al-Shihi, 2012a). This is often difficult for academics for various reasons: lack of experience, skills, and technological mind-set (Watts, 2007).

Adopting this new approach to education would require another considerable investment and time. Although one of the main goals of ICT in education is to speed up the process, many scholars underline that continual management of the e-course makes instructors' work time consuming (Abrahams, 2004; Gillard, Bailey, & Nolan, 2008). Another important issue is the effectiveness of learning management systems which can be analyzed through several parameters: the extent to which LMS is used by stakeholders and their satisfaction (Naveh, Tubin, & Pliskin, 2012). It is necessary to consider that every study in the area of e-learning has a specific focus prioritizing such different issues as technical, social, psychological, and pedagogical.

Integration of ICT in teaching and learning does not only deal with introduction of new hardware and software, but both trainers, the facilitators, mentors and the students have to adopt new roles, and change their ICT behaviours and ways of teaching and learning. As (Farrell, 1999) points out, training and workshops are needed not only to improve the skills of the instructors, but also as a means of getting them involved in the process of implementing and integrating ICTs in teaching and learning. For example, faculty staff (facilitators, mentors, and administrators) requires training not just in the choice and use of appropriate technologies, but more fundamentally in how people learn and in instructional design (Bates, 1997). Pelgrum (1999) recommends staff training to be a continuous process to be regular with the development of ICTs. These trainings are to eliminate digital illiteracy.

It is critical that stakeholders contribute to and own the ICT learning process policy and the plan. Institution-wide consultations are necessary in the identification of challenges, and in proposing areas for ICT application. Stakeholders must agree on the projects to be implemented, including their role therein. Employees must see ICTs as tools rather than as competitors for their jobs.
Studies have shown that an individual's experiences with a specific technology influences perception for ease of use and usefulness of that technology. In addition, Kerka (1999) argued that learner success in distance learning depends on technical skills in computer operation and internet navigation as well as the ability to cope with the substantive subject matter. I totally agree with Kerka argument; that explained why MVP had to organize many ICT training sessions for both students and facilitators. Morss (1999) found empirical evidence that older students who had more experience of the technology used e-learning management system more than younger students with less experience of IT. I disagree with Morss's empirical evidence; this as not the case found at MVP. It is instead the young students, facilitators and mentors who embrace the use ICT enhance their teaching and learning process at MVP.

As if attitude was not enough, digital illiteracy came prominent during future workshop where some students, facilitators and mentors have low ICT knowledge. Digital literacy is an emerging concept. The National Curriculum Framework for All (NCF, 2012) sees Digital literacy as a cross-curricular theme where students, "acquire computer skills that include confidence and critical use of IT for communication, work and leisure. Similarly, the Royal Society for DL in

the “Shut down or restart” report which came out in January 2012 states: “Digital literacy should be understood to mean the basic skill or ability to use a computer confidently, safely and effectively, including: the ability to use office software such as word processors, email and presentation software, the ability to create and edit images, audio and video, and the ability to use a web browser and Internet search engines. These are the skills that teachers of other subjects at secondary school should be able to assume that their pupils have, as an analogue of being able to read and write”. Digital illiteracy can mean stakeholders not having basic hands-on ICT skills.

The external gaps arose during the FW. These were gaps that required time and huge finances. These included professional e-Learning trainers, upgrade the existing ICT infrastructure.
Sound information and communication infrastructure plays a key role in successful the delivery of online content to distance students (Nanayakkara, 2007). Nanayakkara also reported that more often institutions have at least core ICT infrastructure needed to support distributed learning. However, developing online courses requires additional equipment and specialised software, for example, additional servers and KELMS administrator. Student, facilitators and mentors access requires network bandwidth and modem pools or internet service provider connections. These facilities need to be well managed and maintained to achieve a high degree of reliability. Lack of reliability, performance and timely support on infrastructure could inhibit both the tutor and the student from accepting this technology. Similarly, (Tucker & Gentry, 2009) reported that successful implementation of eLearning programs and curriculum depends upon the infrastructure being firmly in place. Galamoyo, (2011) noted that the ultimate delivery of an eLearning solution relies on the availability of appropriate and adequate technology. Once the development process is solid – the learning platform is in place and proven, then roll out strategies can be implemented.

Graves (2000)) as cited by (Nanayakkara, 2007) asserted that most institutions had adopted eLearning technologies, however, they lacked sufficient integration to other administrative systems within the organization. In addition to providing online courses, the institutions needed to provide electronic access to student services such as distance library services, course enrolment, student advice and support services, financial aid and the bookstore (Nanayakkara,

2007). Nanayakkara and Whiddelt, (2005) investigated the factors that influence or inhibit the adoption of eLearning systems in the universities, institutes of technology and polytechnics in New Zealand. The study revealed that external systems characteristics such as capacity and reliability of IT infrastructure were significant factors for user adoption (100% of respondents). It was also observed that establishing a wide range of distance administrative systems such as distance library services and distance student support services would significantly enhance the staff adoption in eLearning technologies (90% of respondents).

Infrastructure often describes a bottom – layer 1 of an architectural description or diagram, indicating network hardware components, communications processes, services and protocols (Blinco, Mason, McLean, and Wilson, 2004). However, for others, it can also serve as a label that includes the ―applications layers or even more broadly, the entire platform required to deliver services. Networks and connectivity are almost universally assumed to be critical to the development of successful infrastructure (Blinco, Mason, McLean, and Wilson, 2004). The development of eLearning products and the provision of eLearning opportunities is one of the most rapidly expanding areas of education and 29 training (Attwell, 2006). Whether this is through an intranet, the internet, multimedia, interactive TV or computer-based training; the growth of eLearning is accelerating.

One of the important challenges of most developing countries is lack of high speed internet access, due to a myriad of factors including but not limited to intermittent electricity, use of expensive low bandwidth satellite technology and inadequately trained personnel (Omidinia, Masrom, and Selamat, 2011). Bates, (2009) reported that given the particular challenges faced by universities in Africa (poor and expensive Internet infrastructure, relatively high cost of computers, shortage of quality IT staff and eLearning specialists, and the need for more knowledge-workers, universities need to be very focused and strategic in their use of eLearning.
Unwin, (2008) also reported on the challenges of eLearning in Africa. In a survey of 147 eLearning practitioners from 34 countries in Africa only 33% reported that they were delivering eLearning in a variety of different ways (Hollow, 2008). KENET, (2007) also reported lack of operational course management systems for eLearning in many institutions and recommended the setting up a course management system. A few institutions had installed course management

software like Moodle, WeBCT or Blackboard and were using them to supplement their classroom teaching but none of the institutions had data on the percentage of courses that were using the eLearning platform (KENET, 2007).

Low bandwidth and access to updated equipment were reported to cause problems for the implementation of eLearning low use of KELMS at MVP. This can be seen at the time KELMS is either downloading or uploading document or a file.

Technological factors include perceived usefulness, perceived ease of use and ICT infrastructure. Perceived usefulness is a major determinant of peoples' intention to use computers. Similarly, perceived ease of use has a significant direct effect on behavioral intention over and above attitude and usefulness. The capacity and reliability of IT infrastructure are significant factors for user adoption of eLearning.

2.3. Implementation of strategies identified during FW to improve usage of KELMS to facilitate teaching and learning

Implementing a learning management system is a large decision for a higher education institution. A large consideration of this decision is the financial cost. Most vendors offer a robust learning management system product but require upfront costs and yearly site licenses. These costs may be especially cost prohibitive if it is a single department or even a small university which is considering purchasing the learning management system. To overcome these issues, some schools have developed their own learning management open source system, such as OpenUSS (Grob, Bensberg & Dewanto, 2004). Institutions should consider exactly what objectives they wish to achieve through the LMS before acquiring a system. Iqbal and Qureshi (2011) suggest the following factors as the most important considerations when selecting a learning management system: organizational goals and objectives, technical specification and support, design specifications, clear and user-friendly graphical interface, well designed course repository, course administration capability, capability of interaction among users, evaluation and feedback, student's profile, and pedagogy. Whether developing an in-house system, opting for an open source solution or purchasing a large system, these issues shape the learning management system decision. The KyU adopted Moodle which is open source LMS systems which has been customised as Kyambogo University E-Learning Management System

(KELMS). The university utilizing constructivist principles with a focus on authentic tasks, cognitive realism, and suspension of disbelief can help facilitate more opportunities for an authentic experience within a learning management system. Creating deeper learning within a learning management system presents challenges within the online environment (Herrington, 2006). Deeper learning principles can be utilized in a variety of ways in a learning management system, but often faculty must think outside the box to implement these strategies. Virtual chat, discussion boards and announcement postings all allow for the social learning element, encouraging interaction between faculty and students. Interactive tests with immediate feedback facilitate active learning where practice and real-world tasks are emphasized. Carefully chosen hyperlinks to websites let students and lecturers explore additional information in a contextual way, integrating the knowledge into the student's world. Engaging learning, respecting multiple talents in a high challenge, low threat environment can be achieved through the use of audio/visual tools and multimedia. Utilizing the learning management system to enhance the ability of students to seek answers quickly can empower them autonomously and allow them to take control through student-owned learning, (Iqbal & Qureshi, 2011)

In addition to ensuring that students are achieving meaningful learning, it is also of utmost importance that they are having a positive experience in the learning management system environment. E-learning is only going to have a greater impact of the learning of students going forward and it is obvious that learning management systems as a resource to students are clear. Materials are available at any time and from any location on or off campus, lectures or difficult topics can be re-accessed multiple times for optimal understanding, and the combination of audio/visual slides and notes serves students of differing learning styles (Raj, 2011). Students have voiced concern over issues within learning management systems. Raj (2011) found that students found the design to not be user friendly, with an unintuitive layout and had difficulty reading from the screen. The stakeholders in FW? also raised the same issue Raj had mentioned about Moodle; that the quality of content from instructors online also varied considerably. Students also appreciated the ability of learning management systems to provide a central repository for information and course announcements. This ease of access allowed them to meet deadlines and have more efficiency with their time.

2.3.1 Kolb - Learning Styles

David Kolb published his learning styles model in 1984 from which he developed his learning style inventory. Kolb's experiential learning theory works on two levels: a four-stage cycle of learning and four separate learning styles. Much of Kolb's theory is concerned with the learner's internal cognitive processes (Kolb, 1984).

Kolb (1984) states that learning involves the acquisition of abstract concepts that can be applied and flexibly in a range of situations; In Kolb's theory, the impetus for the development of new concepts is provided by new experiences. "Learning is the process whereby knowledge is created through the transformation of experience" (Kolb, 1984, p. 38).

In addition, the effect of LMS systems should be especially considered with unique populations of learners such as those learning a language through a learning management system. How well the learning management system conforms to communicative language learning theories, the nature of distance learning and the capability and potential of the system should all be considered when considering this type of coursework in the learning management system (Wang & Chen, 2009). Ensuring that a learning management system is used and developed in a way to serve all learners and facilitate the college experience is of utmost importance. This is seen evidently see at MVP; as the administrators working so hard to achieve KELMS use.

While student concerns are important, MVP issues cannot be forgotten, as facilitators and mentors are the key to guide the educational experience of students. Facilitators and mentors may come to e-learning in a variety of different ways. MVP and KELMS administrators consider having a mix of face to face and online elements. Facilitators and mentors may be pressured by their intuitions to use a learning management system or they may wish to reach a broader audience of students. Some instructors have an interest in technology assisted learning (Wagner, Hassanein & Head , 2008).

KyU presents a variety of concerns in utilizing a learning management system for teaching. Technical sophistication requirements, acceptance of the tools among students and the time it takes lecturers and mentors to create and administer e-learning courses are all issues presented

from faculty (Wagner, Hassanein & Head , 2008). Time concerns have been brought up with regularity from facilitators, lecturers and mentors. Vord and Pogue's (2012) research suggests that while face to face instruction requires more time per student, certain aspects of online teaching take considerably more time per student than in a face to face classroom. Facilitators and mentors do value tools within the learning management system and overall feel value from its interaction. They especially value the ability to transmit documents and efficient communication enabled through the system. Lecturer perception of the value of learning management systems to teaching and learning was highly variable, similarly suggesting along with student's views, that there is a high variability in the content and experience provided on an instructor by instructor basis (Lonn & Teasley, 2007). Concerns and values presented by instructors should carefully be considered when acquiring or utilizing a learning management system.

In educational settings, Dori *et al.* (2002) classified four groups of teachers in the process of technology adoption: "the initiator and path-finder" the enthusiastic, confident facilitator or mentor, willing to implement online technologies; "the follower" the conformist facilitator or mentor, applying online technologies when convenient; "the avoider" the facilitator or mentor using technologies when he or she is forced to; and "the antagonist" one who will not use technology in university under any circumstances. However, for the MVP there were cases where some facilitators are against use of technology to teach and learn.

An additional perspective in considering how to fulfill the potential of technology in education is to examine the nature of the change process for the university as a whole. Fuchs (1995) suggested a theoretical framework for the classification and evaluation of the change process in educational institutions. Implementation of a transformation is influenced by the individuals involved in the process, stakeholders, and the whole university culture. According to Fuchs, for a change process to be substantial, it has to include, among other factors, interactions among circles of various stakeholders not only within the internal circle of an educational institution (i.e. between school principals and staff) but also with students and their parents.

Inevitably, technology has become the most powerful tool in almost every aspect of humans' daily lives. Technology is regarded as a major revolution, and this has had a significant impact on education. The use of information technology (IT) and the internet are the new paradigms of learning in the twenty-first century. These technological advancements allow people to access, gather, analyze, and transfer data and knowledge easily. This makes it possible for them to function as teachers, study-mates, and, more importantly, as tools to improve the entire teaching and learning process. This current development, which relates to the role of IT and the internet shows that the whole educational system has changed.

E-learning experiences are improved when the institution assigns LMS administrator; at MVP whose primary responsibility to ensure the quality components of KELMS course offerings, not the least of which is to provide adequate professional development opportunities for programme in the area of MVP. In fact, administrators must recognize that staffing is both the key to a successful KELMS program and the source of most of the complaints about online programs.

According to Judrups (2015), the development of knowledge management and e-learning unsurprisingly are developed for years as both disciplines deal with knowledge capture, sharing, application and generation; have vital technological components to enhance learning; and contribute to building a continuous learning culture. Judrups (2015) found that knowledge management and e-learning brings both disciplines closer and supports integration. Model analysis confirmed several integration approaches. The more general approach is to base integration on common ground, which is identified as learning. Nevertheless, these approaches are not implemented in production environment and require necessary technical specification and application support.

2.4 Evaluation the usage of KELMS at Kyambogo University

In all action research interventions, evaluation is vital in assessing whether implementations were successful and as such it becomes a vital step for future planning. By evaluation, we ensure

the validity and reliability of action research interventions. When evaluation is done, action built by all stakeholders of an education intervention for this matter leads to making informed transformations of practice in line with the purpose of the intervention; and in this case becomes guiding document on formulation of effective lesson objectives (Tashakkori & Teddlie, 2003).

Several studies (Ansorge and Bendus, 2004) reported that LMS have contributed positively to both instructional and learning needs. Similarly, (Kabassi et al., 2016) argue that the incorporation of e-Learning tools and, specifically, the open source e-Learning platform LMS has paved a new road in the educational procedure and has enriched the traditional teaching methods by encouraging the interaction among teachers, students and educational material. I truly support Kabassi and his team in that LMS can also support long life learning and those students who are already working.

In action research, evaluation is carried out in a formative inquiry, with an aim of bringing about improvement in various aspects of the intervention as it proceeds to next round.

Evaluation can also be done using stakeholder's opinion on the intervention being piloted. Javad et al., 2015 used the opinions of responses for the educational intervention on improvement of teaching skills to evaluate the intervention. The action research study also employed the same approach to ascertain the stakeholders' opinions on the guiding document on formulation of effective lesson objectives.

CHAPTER THREE: METHODOLOGY

3.0 Introduction

This chapter presents a detailed plan, clearly indicating the research design, area of the study, study population, sample size and selection, procedure of sampling technique, data collection methods and instruments, pre-testing (validity and reliability) procedure of data collection and quality control methods, data analysis techniques, ethical considerations and limitations. This is in line with Todd (2012) description of methodology as procedures used to obtain and analyze data.

3.1 Research Design

The study employed participatory qualitative action research design guided by the FW model to collect in-depth primary qualitative information from stakeholders. Both descriptive and comparative analysis were done while undertaking the participatory planned interventions to solve the identified problems. Descriptive analyses involved surveys and various fact-finding enquiries while comparative analysis involved use of pre-post-test evaluation. Secondary qualitative data was collected during document and work process analyses in the preliminary phase of FW. The quantitative part of the study relied on using quantitative measuring tools including an observation checklist and questionnaire. Babbie (2017) agrees with Newman (2006) that the best study design uses more than one research method, taking advantage of their different strength (Babbie, 2007; Kohlbacher, 2006).

3.1.1 Area of the Study

The area of study is Kyambogo University, MVP as focus, targeting mainly, KELMS and MVP administrators, facilitators, mentors, and the students. The researcher is both a student of MVP Cohort Seven and Website Assistant of KyU. The researcher identified the respondents through the face to face interviews and focus group discussions.

3.2 Study Population

The population size of MVP community comprised of stakeholders from MVP Cohort Seven, mentors, administrators of KELMS system and KELMS. In summary form the community is

comprised of 74 students as of August 2017, with 50 (67.57 %) male and 24 (32.0%) female with total of 20 facilitators, mentors and administrators, comprising of 13 (65%) male and 7 (35%) female. However, with special reference to this study, the target population comprised of 34 participants in the following categories: 20 students, ten (10) facilitators and Four (04) administrators.

3.2.1 Sample Size and Selection

Using Krejcie and Morgan (1970) table of sample size determination, I arrived at the sample size of 34 participants as indicated in Table 4

Table 4: Composition of study Participants:

Population, Sample Size and Sampling Technique

Stakeholder Category	Sample Size Target	Actual Sample Size	Sampling Technique
Head of Learning Management System (LMS)	1	1	Purposive
NORHED Coordinator	1	1	Purposive
LMS System Administrator	1	1	Purposive
Mentor	1	1	Purposive
Facilitators/Lecturers	10	10	Purposive
MVP Students Cohort Seven	20	20	Purposive
Total	34	34	

***Secondary Source**: Krejcie and Morgan (1970) table of sample size determination*

The key participants involved in this study were 34 as indicated in table 4. The selection was as follows: Ten (10) facilitators and mentors were purposively selected because they belonged to the MVP program, program where the KELMS research was carried out and helped in the implementation of the agreed strategies for the improvement of the situation. The 20 Cohort Seven (7) students were purposively selected because they had different challenges and were able to give their experiences so as to improve the situation and 04 both KELMS and MVP administrators were purposively selected because they are the decision makers, influential and can make things move to make the situation better. This enabled the researcher to collect valid

information relating to the study and follow up the implementation processes with key participants.

3.2.2 Sample Size

According to (Trochim, 2016), sampling is the process of selecting units (e.g. people, organizations) from a population of interest so that by studying the sample we may fairly generalize our results back to the population from which they were chosen. Sample can be defined as a segment of the population with the same characteristics as the population on whom the study is conducted Burns and Grove (2003). The study had a sample size of 34 respondents for both interview and Focus Group Discussion (FDG) methods that involved 20 students, 10 facilitators and mentors and 04 administrators

3.2.3 Sampling and Technique

As mentioned by (Creswell, 2007), that "the inquirer selects individuals for study because they can purposely inform an understanding of the research problem and central phenomenon in the study", the purposeful sampling strategy was used. The researcher actively selected the most productive samples of all the stakeholders to participate as elucidated by (Patton, 1990) that "the logic and power of purposeful sampling lies in selecting information rich cases for in depth study. Basing on that, the Snowball sampling technique was employed whereby information rich key-informants were identified. A framework in form of an interview guide with the research variables based on the researcher's practical knowledge of the research area; available literature and evidence from the situation analysis were used.

3.3 Data Collection Methods and Instruments used

The study involved 34 voluntary participants and the stakeholders of MVP. The researcher facilitated the participants in Focus Group Discussions (FGD) of 6 participants in each group guided by FW approach of action research. Group members were purposively selected, and its usefulness was based on the conviction that quality and relevant data would be obtained from willing respondents as they interacted during the plenary session of FW. Ultimately, in-depth analysis related to the central issue being studied was realized. Many researchers believe that small group work increases higher-order thinking skills and a higher ability to reason (Berk &

Winsler, 1995). Ideas about the implementation of the intended interventions were generated and discussed in regard to how they could be realized as action research involves the engagement of stakeholders in problem solving to ensure implementation of the suggested solutions (Billett et al., 2012).

Focus Group Discussion (FGD), observation, photography, interview, and reflection were some of the FW methods used to collect data. Tools used include checklists, interview guides, reflection guides, camera, and journal, and survey questionnaires. A combination of such instruments were used in sequence as complementary approaches to the research question. The purpose of the research interview was to explore the views, experiences, beliefs and motivations of individuals on specific matters at MVP as shown in table 5.0.

Table 5.0: Summary of data collection methods and tools

Method of Data Collection	**Tool**
Interview	Interview guide
Focused Group Discussion (FGD)	FGD Guide
Future workshop (FW)	Future workshop guide

3.3.0 Interviews

This technique was used in collecting information as the researcher dialogued directly with team players while on duty where the MVP students, administrators, mentors and facilitators were interfacing with KELMS platform. Interviews were an important part of the project as they provided the researcher with the opportunity to investigate further, to solve emerging problems and to gather data which could not have been obtained in other ways (Thoresen, 2001). Kvale (1996) regarded interviews as an interchange of views between two or more people on a topic of mutual interest. An interview is a direct face-to-face attempt to obtain reliable and valid measures in the form of verbal responses from one or more respondents (Key, 1997). Although the interviewer had a list of themes or questions that were to be covered the interview, guiding questions were converted to structured self-administered questionnaire and the participants responded to the questions at their convenience due to the nature of the MVP programme. This

enabled the researcher and the participants to share and learn from each other throughout the interviewing process in a collaborative manner.

3.3.1 Interview Guide

The researcher formulated a semi-structured interview guide based on the study objectives to gather information from the stakeholder (Cohort Seven students, mentors, facilitators, both KELMS and MVP) administrators) because they provided subject areas within which the interviewer was free to explore, probe and ask questions. This was opted for because it permitted the establishment of confidence and co-operation between the researcher and respondents, which made it easier for the interviewer to get vital information.

3.3.2 Document Review

Secondary data in form of documents that contained important information related to the area of study were analyzed (as already explained in the early chapter of this report during situational analysis). This was done to get secondary data from which the researcher obtained information, he presented to the stakeholders during the FW session that enabled the stakeholders make informed decisions. By doing this the researcher was able to get the perception and opinions of the MVP stakeholders (Cohort Seven students, mentors, facilitators, both KELMS and MVP) administrators) with respect to improving use of KELMS at KyU; especially MVP.

3.3.3 Photography

During the course of the research there were generated images which were widely used as ‘visual records’ or as ‘a visual diary’(Posser, 1998). Informed consent was obtained from voluntary participants before taking pictures. Photography is assumed to have the ability to perform a more multifaceted role in a study. The tools provided multifaceted information about the students, mentors, facilitators and about their interaction with the KELMS during their facilitation, as evidence to validate the research data, to stimulate discussions, to encourage participation in reflective thinking and as an aide-memoir.

3.3.4 Reflection

Reflection being the most important element in action research requires team players to reflectively discuss the progress of the carefully planned and assigned duties as per action plan made during FW session. Information on their beliefs and perception on how effective the proposed changes were; what the emerging issues to learn from, barriers to change and how these changes could be improved to make a better future was obtained. Critical reflections were taken both in isolation and within small group discussions where ideas and impressions were shared. Changes in attitude and practice among those concerned with the interventions to improve on KELMS use was emphasized (Kemmis, 1990), and reflective practitioners explored their thinking through dialogue (Schön, 1983).

3.3.5 Focus Group Discussions

This is in line with participatory action research approach which upholds that the problems within an institution should be based on group discussions (Mikkelsen, 2005). The focus group discussions were used especially during situational analysis process and during data collection, validation and report writing. This method helped the researcher to understand participant's responsibilities, benefits, desires, research issues and to plan for improvement. Focus group discussion is a participative method that involves a homogenous group of respondents in the discussion of issues of common concern through a moderator (Mbabazi, 2007). The study had five FGDs (three of students and two of facilitator, mentors and administrators) of six respondents each. A focus group typically consists of discussion among six to eight participants who are interviewed by a moderator (Jupp, 2006). In this research 34 respondents (Cohort Seven students, mentors, facilitators, both KELMS and MVP) administrators).

3.3.6 Participant observation

Since action research aims at promoting change, a record of the situation before, during and after the change was done and kept in recorded form in a journal. Participatory observation offered the researcher an opportunity to gather live data from a naturally occurring social situation. Observational data collection technique was used to collect data on evidence of teaching methods, assessment methods, availability of skills to ICT facilities, and suitability of skills

acquired. Observation is also very instrumental in measuring the performance of students, mentors and facilitators while using ICT equipment as well as use of LMS. Students, mentors, and facilitators were monitored, observed and rated as they used LMS platform.

Miller (2006) said that observation means using ears and eyes to obtain data about people, events and places. This method involved recording all those phenomena (ICT gadget, KELMS practical encounters with KELMS administrator, KELMS platform etc.) which are visible to the human eye. It involved making critical analysis of events, seeing, hearing and smelling things. The tool was instrumental in gathering detailed and accurate first-hand data. This method was helpful in triangulating the information acquired from the interviews with the information got from FGDs.

3.3.7 Future Workshop Guide

Unlike in the situational analysis (sub-section 1.2.3) where FW was used as problem identification tool, at this stage, FW was used as a data collection tool. As a tool, FW supported participants in identifying common problems and to develop visions and ideas. It was originally developed for native groups with limited resources who wanted to have a say in the decision-making process. It helped to shed light on the common challenging situation, generate visions about the future and to discuss how these visions can be realized. FW is a good tool for tackling complex problems where many, often seemingly contradicting views have to be fitted together (Lauttamäki, 2014). FW was developed by Robert Jungk and Norbert Mullert in the 1970's (Apel, 2004) as an investigative way to highlight problems and look for suggestions to solve them. This method involves the participants of the institution in the process of working out solutions according to the existing situation.

I employed this tool because once stakeholders are directly involved in the process, they are often recognized as being the best players to make suggestions about improvement in their own work environment. Empowering them by counting on their opinions provides them with authority, responsibility and accountability for required decisions (Jose 2004, vol. 10 No 2).

3.3.8 Validity and Reliability

The researcher logically documented data gathered from group dialogues with students, facilitators, mentors and both KELMS, MVP system administrators, and also from personal logs

and field notes ensuring their validity and relevance to the study (Loh, 2013). A broader concept of validity is considered as the degree to which a method investigates what it is intended to investigate (Brinkmann, 2008). The reliability of this qualitative study was ensured by giving the students, mentors and facilitators the pre-post-test in order to measure the effect of the interventions done to improve on their use of KELMS.

For the purpose of this research, triangulation of methods as one form of validation was frequently used. Triangulation is a concept perceived as the use of different methods to obtain views on the same object of the study. This concept is supported by Diane Millar where she suggests that it is better for action researchers not to rely on only one source of information or on one method of data collection or on only one data collection tool (Millar, 2008). She argues that research is stronger if the information is collected in many ways and that triangulation helps in providing more meaningful data analysis.

One merit associated with triangulation (mixed) approach is that it tests the consistency of the findings obtained through different instruments. Triangulation increased chances to control or at least assess some of the indulgences or multiple causes influencing our results (Patton, 2001) and became a device for enhancing the credibility and persuasiveness of a research account (Bryan, 2002). For purpose of this study the researcher used different methods including unstructured interviews, participatory observation, conversational interviews, discussion and dialogue, photography, document analysis and also different data collection tools which included field notes, camera and audio-visual recorder with an intention that each method or tool supplemented the results obtained using the other. According to Merrian, (1995), use of multiple investigations, multiple sources of data or multiple methods helps to confirm the emerging findings.

3.4 Procedure of data Collection

Data was collected using the future workshop model which involves four phases: preparation, critique, fantasy, reality and implementation phase.

In the preparation phase, the researcher presented an introduction letter from Kyambogo University seeking for permission to carry out action research and verbally explained the purpose

of the research to the NORHED and KELMS/ICT Coordinator of Kyambogo University. The researcher organized meetings to draw the work plan for all the activities that were done during the action research process. The researcher together with the participants carried out work processes analysis of what stakeholders go through from the start to the end use of KELMS and after their presentation, the following work processes were agreed upon as: Admission; KELMS teaching and learning processes, assessment and evaluation of learners. Participants observed that all work processes needed improvement but dealt with the more pressing ones that could be handled within the short time frame.

3.4.1 Data Analysis

Data from the interviews and focus group discussions were coded, analyzed manually by first identifying major themes and sub-themes based on the study objectives and questions. The schematized data frequencies that were got from interview findings were coded, edited and arranged and analyzed. The data obtained was manually tabulated with frequencies and percentages which were used in the decision making, comprehensive interpretations and other related inferences. From the qualitative data obtained, the emerging ideas, opinions and beliefs were critically analyzed and synthesized with what other writers have said in the literature review in order to make them more comprehensive. This was done in order to fill the literature gaps.

3.4.2 Ethical Considerations

The research method used was Participatory, and participatory action research (PA) is a broad approach to research that treats human participants as collaborators rather than subjects. Often employed in projects concerned with policy and practice or service delivery, PA also aims to demystify the research process and enable non-professionals subsequently to do their own research. Punch (1994) discusses ethical issues which include informed consent, dishonesty, privacy, harm, identification and confidentiality for example, Informed consent was obtained from voluntary participants before taking pictures. Photography is assumed to have the ability to perform a more multifaceted role in a study. Many argue that PA research is inherently ethical, because this type of work involves placing a high degree of responsibility on the research

participants, and demands continuous reflexivity about, and sensitivity to, emergent ethical issues as the programme of research unfolds.

To address the ethical issues, the researcher presented an introductory letter to the respondents from the faculty of Vocational Studies, department of Art and Industrial Design of Kyambogo University so as to avoid bias and give focus of the study. Principles of ethics were purely taken into consideration in the course of the research. Respondents were left to retain the independence of their minds and free decision-making process.

Confidentiality: The participants were guaranteed that the identified information would not be made available to anyone who is not involved in the study and it will remain confidential for the purposes it is intended for.

Permission: The researcher sought permission to carry out the research from the University

Informed consent: The prospective research participants were fully informed about the procedures involved in the research and were formally asked to give their consent to participate as per attached appendix 8: Informed Consent Form.

Anonymity: The participants remained anonymous throughout the study and even to the researchers themselves to guarantee privacy.

The researcher also ensured privacy of the information given since it was for academic purpose and therefore the privacy of the participants was guaranteed. The issue of anonymity was considered, that is to say the information provided by the respondents was in no way revealing their identity and lastly the researcher ensured maximum accuracy of the information.

Recording responses during the interviews and focus group discussions was done under the permission of the participants to avoid fear and suspicions.

CHAPTER FOUR: ACTION IMPLEMENTATION, RESULTS AND EVALUATION

4.1 Introduction

This chapter presents the finding of the study. The presentation of the findings follows the objectives of the study as reflected in chapter one; to design appropriate strategies to improve usage of KELMS and digital literacy, to implement the developed strategies, and to evaluate the strategies aimed at improving the use of KELMS to support teaching and learning processes.

4.2 What are the possible factors affecting use of LMS at KyU?

On 29th October 2018 at computer centre laboratory in the future workshop meeting which was conducted; A list of factors that hinder use of KELMS in the learning processes at MVP were identified and they included the following: digital illiteracy, little or lack of basic knowledge on ICT for students, poor technical support, no link between training and practice for mentors, students and facilitators, communication gap, no content, unusual experience, poor perception towards use of technology in teaching and learning, no schemes of work and lesson plans, lecturers do not upload their course into the KELMS, digital literacy not good among lecturers, mentors and students, inadequate training on KELMS use, no resident KELMS administrator at MVP, students not practically assessed, requires lots of time, indiscipline among learners, fear to use technology, inactive course leaders, poor KELMS infrastructure, poor local technical support, bureaucratic administrators both (KELMS and MVP), change internet Scriber Provider, procure modern ICT equipment at MVP, collaboration with international organizations in the area of LMS, inadequate computers/laptops for use, many end-users sharing one computer, KELMS not integrated with ZOOM video conferencing facilities, lack of ICT training skills by the end-users and lack of webinars for the learners and mentors.

The factors affecting the use of KELMS at KyU were then clustered into 4 categories: i) administration ii) poor attitude iii) poor internet connection iv) digital illiteracy and v) external factors. A democratic process was carried out to choose the critical challenge and the results were as follows: administration 15 votes; poor attitude 3 votes; digital illiteracy 3 votes; poor internet connection 0 votes and external factors 0 votes. The challenges were further scrutinized during the Future Workshop (FW) as a methodology applied, and subjected to pair wise matrix

(appendix page 86) leaving only three categories namely, administration, digital illiteracy and poor attitude.

The researcher asked the stake holders to choose that category which could be handled within their means and the time available. However, the major problem which the participants identified which could be solved within their means and available time was administration. Therefore, it was agreed by the participants that organization of administration to improve the use of KELMS in teaching and learning at MVP was the major problem that needed implementation or intervention?

Furthermore, unanimously it was later agreed that the administration, digital illiteracy and poor attitude all be implemented as well since one could not be handled without the others.

4.3 Action Plan for Participatory Implementable Interventions

The study involved 34 stakeholders of which 20/34 (58.8%) were Cohort Seven students, 10/34 (29.4%) were facilitators and mentors, 4/34(11.8%) were both KELMS and KyU administrators. The team players were the voluntary participants who took part in implementing the assigned tasks to ensure that the research questions get the intended solutions.

After analyzing the situation of the KELMS through using work process analysis and future workshop methods (Refer 1.2 situational analysis above), the stakeholders came out with an action plan as indicated in Appendix 2: Action plan to implement the best solutions.

4.4 Implementation of the strategies to improve use of KELMS in teaching and learning at MVP

Under this objective, strategies that were adopted during future workshop were clustered into seven (7) categories and were recommended for implementation by the participants. The following were the strategies identified: set compulsory practical tasks on KELMS, upload class activities on KELMS, lead researcher ensures course leader uploads courseware, lead researcher to ensure active use of KELMS by student, involve technical persons in use of KELMS, provide LMS gadgets and ensure KELMS accessibility and flexibility.

The implementation of the strategies was based on improving administration, digital illiteracy and poor attitude amongst Cohort Seven students, mentors and facilitators.

4.4.1 Set compulsory practical task on KELMS

The implementation to be effective in the use of KELMS, there were series of tasks provided to students to help them to get them to use system. These tasks were; assignments, blogging, and participation in forums that were set by facilitators.

This made effective use of the system and made students polish their skills to get used to the system. Setting compulsory practical tasks on KELMS to some extent helped administrators to improve the use of the system. They followed the deadlines for submissions of some tasks while some students requested for some more time to submit their assignments.

Digital literacy improved amongst both student and facilitators as there was no choice, but to learn how to use ICT to learn and facilitate respectively. This made stakeholders to appreciate the beauty of using ICT to facilitate and learn.

Poor perception amongst some of the students, facilitators and mentor changed with compulsory uploading all tasks into KELMS.

4.4.2 Upload class activities in KELMS and follow-up

The future works uploading class activities into the KELMS to be one of the interventions. This meant that all the facilitators, mentors and students were supposed to upload their course unit assignments into the system, blog. This was followed up by both MVP and KELMS administration.

This did not work well as some of the assignments were not uploaded into the KELMS system by respective course leaders. Therefore, the intervention was not to fully utilized. I suggested that this strategy could work in the second cycle of the research.

The administration (both MVP and KELMS) was in the centre of ensuring that all class activities were uploaded into the system. There were some sessions organized specifically for mentors, facilitators and students to upload their coursework tasks into the system.

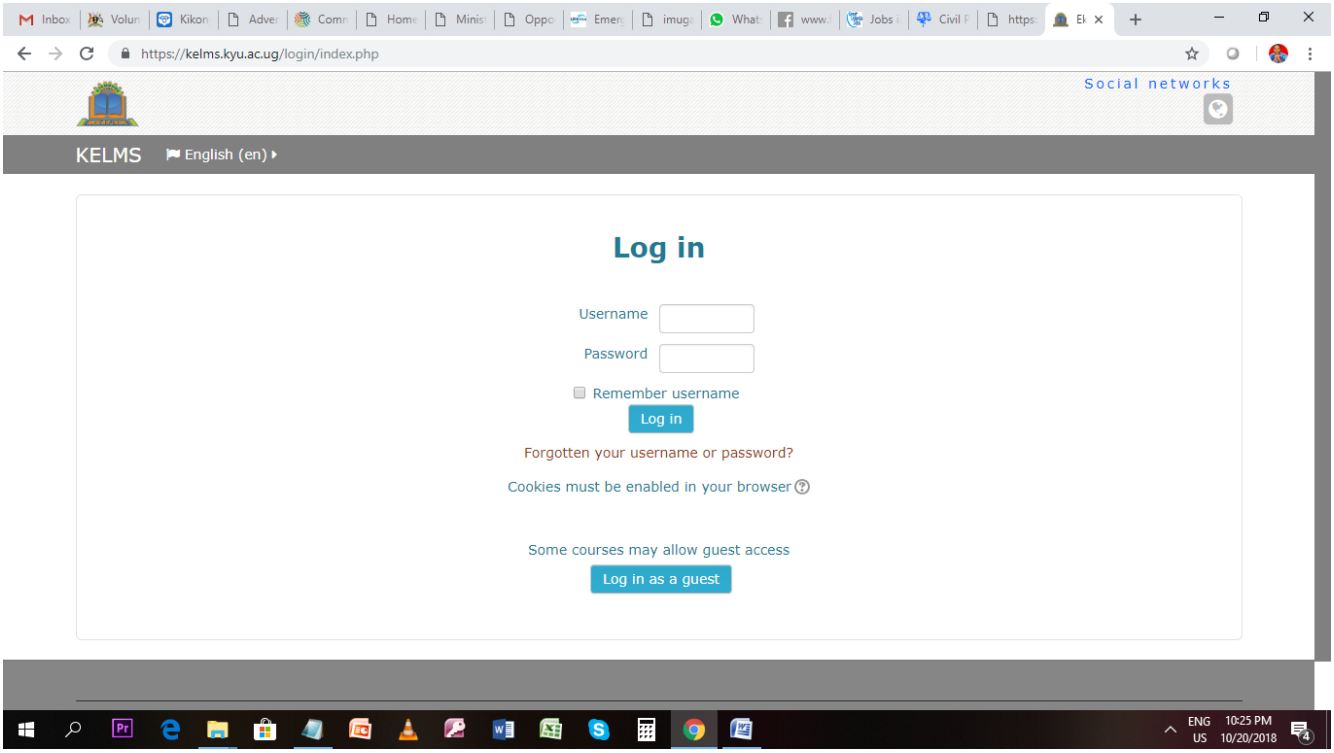
This intervention worked ensuring ICT and LMS skills attainment. This engaged stakeholders which made them to acquire hands on skills and further changed poor attitude towards KELMS use.

4.4.3 Involve technical persons in use of KELMS

This intervention was implemented during implementation phase. The ICT staff (Computer Centre) of Kyambogo University, and lead researcher were fully involved to ensure that the KELMS administrator was fully involved in KELMS user trainings.

The KELMS administrator in the E-Kampus office together with leader researcher were most times available to help any stakeholder who had challenges. The technical team (KELMS administrator and lead researcher) were mainly on uploading and downloading, how to log into the KELMS system, and updating user profile.

Figure 4. How to log-in into KELMS



Primary Source: How to login on to Kyambogo University Learning Management System (KELMS), www.kelms.kyu.ac.ug/login

4.4.4 Lead researcher ensures active use of KELMS by learners

The MVP Cohort Seven students were led by the lead researcher ensuring that ICT facilitations were organized. The first interventions were to make sure that the students were introduced to hands-on computer use and then later to KELMS training. The students had more than five KELMS trainings which were organized by MVP administration in collaboration with KELMS ICT system administration.

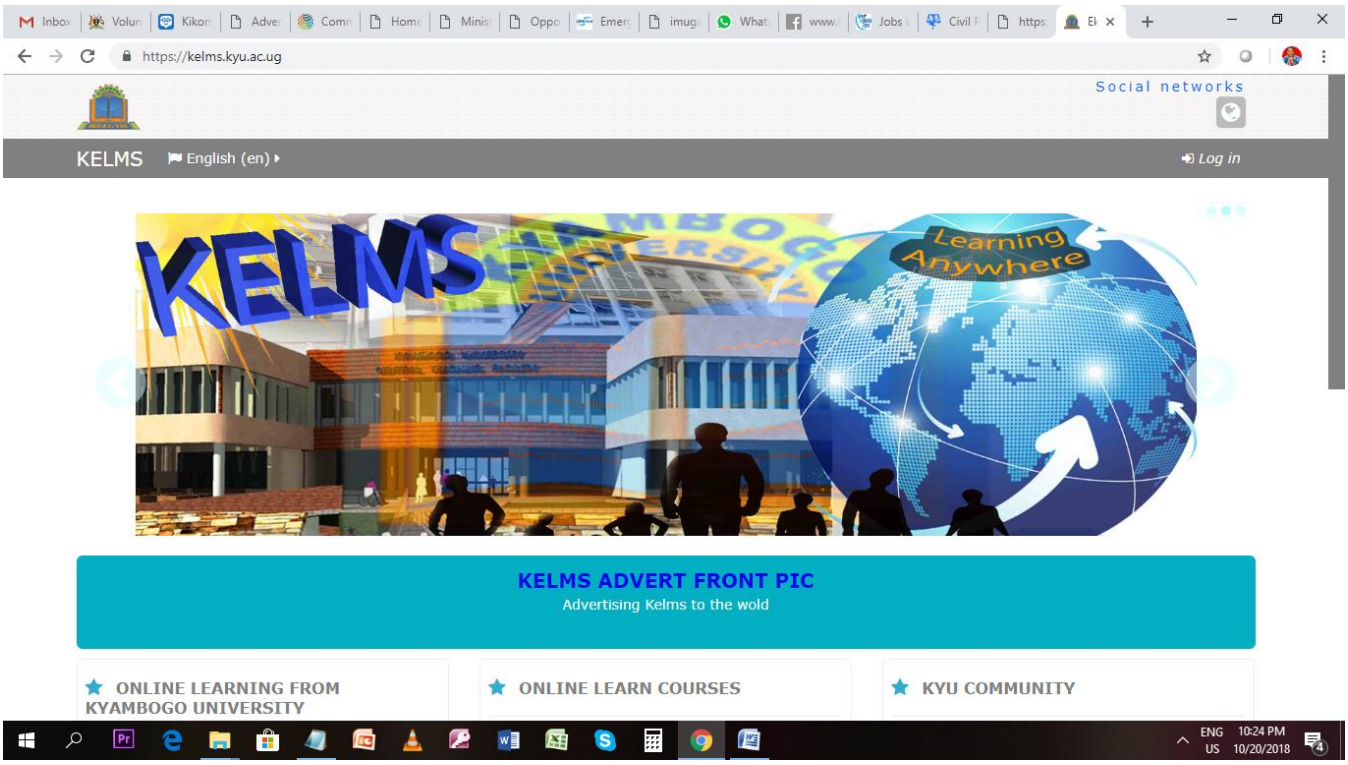
However, the trainings comprised of how to log-in, to update their profile information, location of their course, uploading and downloading their docs, blogging, participate in discussion forums and sending messages among themselves.

The students were able to upload their course unit assignments through the platform, although others still needed some help from KELMS administrator and lead researcher.

The lead researcher made sure the ICT/KELMS facilitations were included on the MVP timetable. This intervention worked to some extent, but some students were sometime absent.

In conclusion, students were able to link their KELMS account with social media accounts including Facebook, Twitter and LinkedIn accounts.

Figure 5: KELMS User Interface



Primary Source: KyU Learning Management Systsem (KELMS)

Lead researcher with MVP Cohort Seven Students on how to submit their assignments.

Being a Website developer, the lead researcher further helped in the absence of the KELMS system administrator to facilitate MVP cohort 7 students on KELMS use. These trainings were in consultation with MVP administration. This meant that administration was fully committed in KELMS use at MVP.

With constant follow-up by lead researcher, imparting ICT skills needed in KELMS use was made easy and all stakeholders benefitted even most participants changed the attitudes towards ICT use.

4.4.5 Lead researcher to work with the course leaders on uploading course work and follow-up on KELMS

Implementation intervention worked to some extent with mentors and facilitators in uploading courseware into the KELMS. This is because some facilitators had not prepared courseware for some of their course units to be uploaded into the system. It should be mentioned here that most MVP course units namely: VP611, VP 612, VP 613, VP 621, VP 622, VP 623, PS 511, PS 512, VP 711, VP 712, and VP713 are already uploaded by some facilitators and mentors into the KELMS. We cannot run away from the fact that the KELMS is still a challenge to some of facilitators and mentors. This will take some time to bring all of them on board with continued trainings and facilitations.

4.4.6 Provide LMS Equipment

The Learning Management System (LMS) is ICT based teaching and learning platform which require the following gadgets; laptops, desktop computers, internet connection, power to charge, tablets, Ipads, web-based applications and the like. It was very important that stakeholders have access to ICT gadgets to access the KELMS platform.

It was noted during the implementation of this research that MVP Cohort seven students had no personal computers/laptops. This made implementation difficult as after they were out of the MVP computer laboratory, they could not access laptops or computers to practice what they had learnt and even to beat deadlines to submit their tasks for marking. However, the ICT Ekampus department of KyU made it easy to access the KELMS on all the wireless hotspots within the Kyambogo University community. As shown in the fig. 9 below.

Figure 6: Kyambogo University KELMS User Network Map

Primary Source: Kyambogo University Network Map for all hosts, 10.40.0.11/nagios

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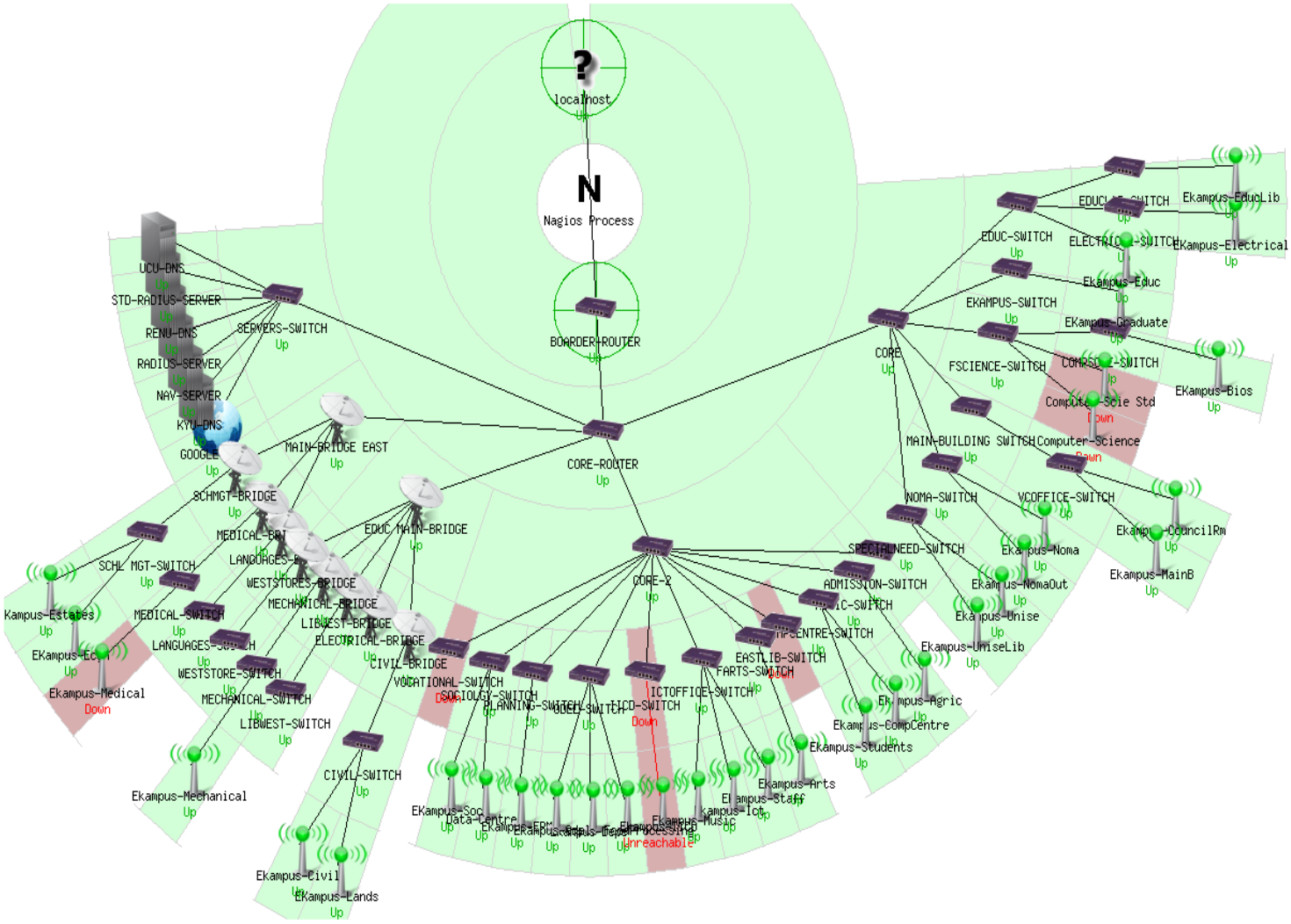

MVP Cohort Seven Students acquired digital literacy skills

Most of the MVP cohort Seven students did not own personal laptops that would help them to practice and even work on their tasks on time for assignment submission.

Providing computers and laptops to MVP students meant that the administration was motivated to support the KELMS and learners to improve use of KELMS and facilitate learning processes. With sharing the laptops and desktops in the computer laboratory the students were further motivated to ICT and KELMS to enhance their teaching and learning processes. The attitude of learners changed towards ICTs.

4.4.7 Ensure KELMS accessibility and flexibility

During the examination of the factors affecting KELMS use, it was found that there were challenges with accessibility of the system. The KELMS users would take very long time to access the system. The intervention by the KELMS administrator was to increase more internet bandwidth so that the KELMS web page browser could easily be reached and allow users to access their accounts. Another intervention was to organize more training for the end-users to get hands-on practice to master the inputting of their usernames and passwords.

By the end of the research period, the KELMS accessibility had improved and users could easily log-in into their KELMS accounts to upload and download their files. The KELMS platform portal was worked on where the course units were well arranged for access. MVP administration wanted the portal to look attractive more appealing to change that poor attitude towards KELMS. This change of portal motivated stakeholders to use the platform to teach and learn.

4.5 Action implementation, results and evaluation

Appraisal of action implementation results was conducted with the help of an interview guide and a focus group discussion guide. The results were compiled from students, facilitators, mentors and KELMS systems administrators and results are presented accordingly in Tables 4.2 and 4.3.

4.5.1 Evaluation from stakeholders

Feedback from evaluation was collected from 34 stakeholders as shown in Table below.

The stakeholders (Cohort Seven students, facilitators and mentors,) were evaluated based on the following: participate in forum, uploading (courseware, assignments etc.), and blog, send email, chat or send message amongst themselves as shown in (Appendix 3).

Table 4.1: Evaluation responses collected from stakeholders after implementation

Strategy	**Response**				
	Strongly Agree	**Agree**	**Disagree**	**Strongly Disagree**	**Total**
▪ Set compulsory practical tasks on KELMS	21(61.8%)	10 (29.4%)	3 (8.8%)	0	34
▪ Upload class activities in KELMS	16(47.1%)	8 (23.5%)	9(26.5%)	1(2.9%)	34
▪ Lead researcher to work with the course leaders on uploading course work and follow-up on KELMS	17(50%)	7(20.6%)	6(17.6%)	4(11.8%)	34
▪ Lead researcher ensures active use of KELMS by learners.	23(67.6%)	8(23.5%)	3 (8.8%)	0	34
▪ Involve technical person in KELMS	16(47.1%)	12(35.3%)	6(17.6%)	0	34
▪ Provide LMS gadgets	23(67.6%)	7 (20.6%)	4(11.8%)	0	34
▪ Provide easy accessibility and flexibility on KELMS	6 (17.6%)	6 (17.7%)	9(26.5%)	13(38.2%)	34

Primary source: MVP survey, NOMA July 2018

4.5.2 Interpretation of findings

Responses from the stakeholders (MVP Cohort Seven students, facilitators and System administrators) about the strategies revealed thus: 61.8% strongly agreed to set compulsory practical tasks on KELMS, while 29.4% agreed and 8.8% disagreed. On uploading class activities in KELMS, 47.1% strongly agreed, 23.5% agreed, 26.5% disagree and only 2.9% strongly disagreed. About 50% strongly agreed that lead researcher working with course leaders

made an impact on KELMS use, while 20.6% agreed, 17.6% disagreed and 11.8% strongly disagreed. On the lead researcher closely following active use of KELMS by students, 23.6% respondents strongly agreed, 23.5% agreed and only 8.8% disagreed. Involvement of technical person in KELMS 47.1% strongly agreed, 35.3% and 17.6% disagreed, the provision of LMS gadgets 67.6% strongly agreed, 20.6% agreed; while 11.8% disagreed, KELMS accessibility provided the lowest percentages with 17.6% strongly agreed, 17.7% agreed to that strategy worked while 26.5% disagree and 20% strongly disagreed that the interventions that we implemented improved the KELMS use.

In conclusion, investment in LMS gadgets and follow up by lead researcher in active use of KELM were the factor that motivated and changed attitudes of stakeholder to appreciate use of KELMS in teaching and learning.

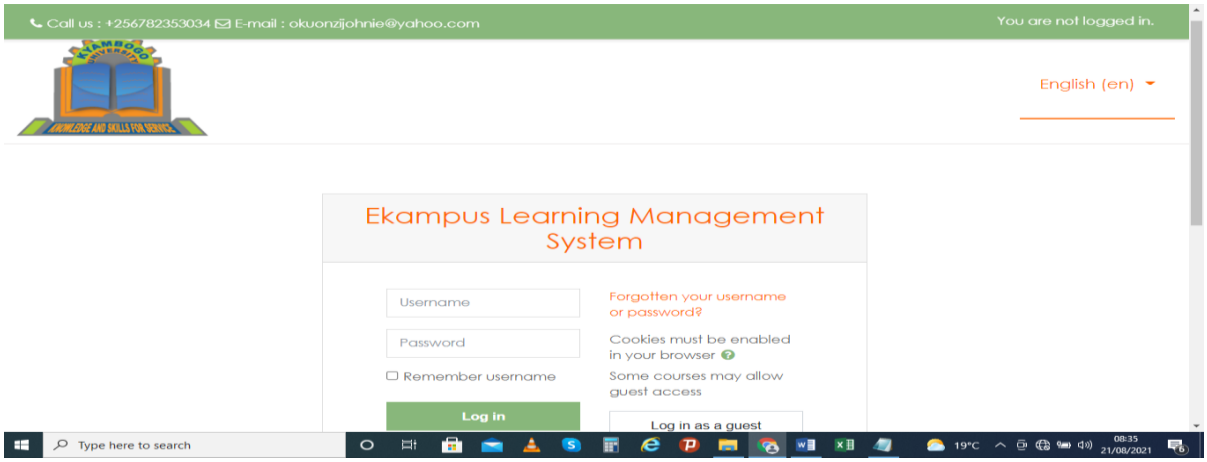

Figure: 7

Primary Source: Kyambogo University KELMS End-User Login Interface

https://kelms.kyu.ac.ug/login/index.php

Figure 7: Shows KyU KELMS End-User Login Interface

Digital illiteracy was strongly agreed; this made participants receive trainings on ICTs using KELMS End-user interface portal which was conducted by both LMS researcher and KELMS administration in many occasions.

CHAPTER FIVE: DISCUSSION, CONCLUSION AND RECOMMENDATIONS

5.0 Introduction

The study set out to strengthen the digital literacy among teachers to improve the use of KELMS in teaching and learning processes at KyU: case of MVP.

5.1 Discussion of findings

The discussion of findings is presented according to the objectives as follows:

5.1.1 Analyzing the use

After analyzing feedbacks from the stakeholders during evaluation period it revealed that there was improvement in the use of KELMS. KELMS administrators made sure that KELMS was used in some facilitation and some facilitators were able to get assignments feedback from the platform.

5.1.2 Examining the factors that affect KELMS use

The factors that were identified for improving KELMS use in teaching and learning were examined as per the details in Table 1.2. The stakeholders who included MVP Cohort Seven students, facilitators and mentors were involved in the processes of factors identification. Though many factors were identified, this study continued to examine those that could be implemented within the period of one year as per the details in Table 1:5. These factors examined were the administration, attitude, digital illiteracy and external factors. This is supported by (McNiff, 2016) who affirms that action research is about evaluating your practice; to check whether it is as good as you would like it to be or to identify areas that need improvement and to find ways to improve them.

Through action research, future workshop which was conducted in phases which enabled facilitators, mentors, students and administrators to analyze, examine and generate actionable solutions to the challenges democratically. Since action research was participatory, stakeholders contributed suggestions to solutions for implementation and were observed because their aim was to bring about change in KELMS to enhance teaching and learning processes at MVP. This

is supported by (Meyer, 2000) cited in (Hine & Laverly , 2014) affirmed that focusing on generating specific solutions to practical, localized problems, action research empowers practitioners by getting them to engage with research and the subsequent development or implementation activities. Similarly, accordingly to the transformative theory of learning, teaching and learning occurs when educators critically examine their practice and develop alternative perspectives of understanding their practice (Cranton & King, 2003).

Lysaker & Furuness (2011) affirms that educators critically examine the assumptions that underlie their practices. The consequences to their assumptions and develop alternative perspectives on their practice through conducting action research. In this study stakeholders analyzed and examined the gaps and agreed on the work plan, shared roles in implementation. Evaluation revealed some changes at MVP among students, facilitators, mentors and administrators. Similarly, Mills (2013, p. 8 cited in Hine and Laverly 2014) noted that the goal of educators conducting action research as: "gaining insight, developing reflective practice, affecting positive changes in the school environment, educational practices in general and improving student outcomes and the lives of those involved".

Furthermore, the factors identified by stakeholders included: fear to use technology, human and tool (Teaching and Learning Methods culture), rigidity to certain ways of work, no link between training and practice for mentors, inactive course leader, no content, poor follow-up, not practically assessed, poor self-motivation among students, external factors, bureaucratic management system, insufficient time for students, little knowledge of information communication and technology (ICT) for students, deliberate us of the system is not functioning, course leaders are inactive to prompt other mentors upload their content, willingness to engage in LMS technology/ICT, inadequate training, digital illiteracy among lecturers, lack of local content, poor implementation, lack of seriousness, lecturers do not upload activities into the LMS, insufficient technical support, poor perception (it is difficult), poor attitude towards use of technology in teaching and learning, poor infrastructure, require a lot of time that lectures don't have and no local systems administrator at NOMA. Though they were many identified factors, these factors were clustered together according to their similarity as shown in (chapter two table 1:4) literature review.

5.1.3 Implementation of the strategies

The stakeholders generated implementable solutions (refer to Table 1.2: implementation plan)

5.1.3.1 Administration

Administration was one the factors that was implemented. The aspect of administration comprised of KELMS and MVP administrators. During the implementation stage administrators were helpful in ensuring that the KELMS Cohort Seven students, facilitators and mentors were using the system. However, the KELMS systems administrator was responsible for updating, enrolling facilitators, students and so on. KELMS Moodle has a rich set of student-monitoring services such as Gradebook, Activity Reports, Block Reports, Logs, and Portfolios that are an essential part of the learning environment. The MVP administrators were helpful in ensuring that each semester there was LMS facilitation included on the MVP timetable.

5.1.3.2 Poor Attitude

Attitude is a predisposition to respond favorably or unfavorably to an object, person, or event.
To successfully initiate and implement educational technology in school's program depends strongly on facilitators' support and attitudes.
AI-Khaldi and AI-Jabri (1998) asserted that individual attitude consists of what a person feels about an object (affective), think (cognitive), and plan to do in the future (behavioral). The success of any initiative intended at implementing technology in an educational program depends strongly upon the attitudes of the faculty members involved (Al-Erieni, 1999; Clay, 1999; Davis, Bagozzi, & Warshaw, 1989; Hamdi, 2002; Zhao, et al., 2002). Faculty stakeholders who hold positive attitudes toward technology in general feel comfortable using it and are more ready to overcome arising obstacles (Albirini, 2006; Hamdi, 1991). Similarly, Yang and Yoo (2004) investigated the relationship between the affective attitudes and the cognitive attitudes of users and the extent of their usage of technology. Hence, if the faculty members have a positive attitude toward kelms LMS, they are more likely to be motivated to use kelms.

The success of any initiative aimed at implementing technology in an educational program depends strongly upon the attitudes of the faculty members involved (Al-Erieni, 1999; Albirini, 2006; Clay, 1999b; Hamdi, 2002). Faculty members who hold positive attitude toward

technology feel comfortable in using it and are more ready to overcome arising obstacles (Albirini, 2006; Hamdi, 2002). According to AI-Khaldi and Jabri (1998), the overall attitude the faculty members reflected toward computer technology directly influenced the extent of computer utilization. Experience has showed that some students, facilitators and mentors do not appreciate use ICT to facilitate or learning platform, they appreciate the traditional method of chalk and blackboard, while the lecture stands in front.

The learners, facilitators or mentors who have ICT skills grasped LMS concepts better through observing experiments and practicing what they observed and so did the KELMS users. In order to introduce the concept of "learning by doing", MVP cohort seven students were assigned tasks in some course units with the aim of integrating theory into practice. The concept of working by doing helped to practice what they learnt during their ICT facilitations. For example, one student was tasked to share her experience with KELMS and had this to say;

> *" During my first attempt to use KELMS, I failed, but after trying several times. I owned the learning process; lastly, I have mastered the process of uploading course materials into the platform". (Response from student).*

5.1.3.3 Digital illiteracy

Digital illiteracy is when one lacks set of competencies required for full participation in a knowledge society. It includes knowledge, skills, and behaviors involving the effective use of digital devices such as smartphones, tablets, laptops and desktop PCs for purposes of communication, expression, collaboration and advocacy. It should be stressed out that during the implementation process; so many ICT trainings were organized for students, facilitators and mentors including LMS. These trainings were organized to have digital literacy amongst the students and facilitators and mentors. Although students are generally technology savvy and thus able to manage computers well, lack of computer literacy is a major issue among students today. This training was organized for learners/students and facilitators. Many of them cannot operate basic programs such as Microsoft Word and PowerPoint and therefore are not able to handle their files. However, this was not found true with some mentors, facilitators and Cohort Seven student. During the implementation period, ICT trainings were conducted a bid to impact the digital literacy so as to use KELMS. Furthermore, many students find fixing basic computer

problems troublesome, as they have no knowledge in this area. However, technological proficiency is a must for following online courses, as it enables students to manage their assignments and courseware in an organized manner without struggling. Basic courses in computer literacy enhanced mentors', facilitators' and students' knowledge in the field; having a fundamental knowledge of KELMS to submit, upload their assignments and participate in forum discussions.

While digital literacy initially focused on digital skills and stand-alone computers, the focus has shifted from stand-alone to network devices including the Internet and social media. The term digital literacy was simplified by Paul Gilster in his 1997 book Digital Literacy. Gilster described digital literacy as the usage and comprehension of information in the digital age. He also emphasized the importance of digital technologies as an "essential life skill". From the analyzing point of view, Students at the current stake were able to submit their course assignments, participate in forum discussions and posts into their blog accounts about their passionate topics. However, the reverse is true for some facilitators and mentors who still have challenge in uploading or downloading courseware in or from respectively from KELMS platform.

5.1.3.4 External factors

These factors came into the discussion during the future workshop (FW); which comprised of external expatriates, change of ISP vendors to provide better internet services. There is a body of research that show that the assistance of external LMS expertise, consultants and vendors and their respective quality is one of the most important aspects of the LMS adoption and user process within LMS system (Ghobakhloo. M, Arias-Aranda, D., Benitez-Amado, J., 2011). Their professional abilities could have positive impacts on the LMS use and adoption process while most universities suffer from a lack of both IT experts and the hiring of external consultants (Walczuch,R.; Van Braven, G.; Lundgven, H. , 2000). According to Thong et al. (Thong, J.Y.L.; yap. c.S.; Raman, K.S., 1997) and Thong (Thong, 1999), external consultants and vendors are the main sources of external LMS expertise regarding LMS implementation within small businesses.

As action research is cyclic in nature, we implemented only the short-term factors

From the data interpretation of the findings refer to (Chapter 4.5.2), we can deduce that this action research which was conducted at MVP made significant mark and KELMS will never be the same.

In conclusion, investment in LMS gadgets and follow up by lead researcher in active use of KELMS were the factor that motivated and changed attitudes of stakeholder to appreciate use of KELMS in teaching and learning.

5.2 Conclusion

Conclusively most of the intervention strategies that were devised were successful. The findings of the study also indicated that most of the gaps that were presented by stakeholders at the future workshop to strengthen the digital literacy among teaching staff to improve the usage of Kyambogo University E-learning Management System (KELMS) to support teaching and learning process were achieved including: hands on ICT trainings, course ware materials and assignments were uploaded or downloaded from KELMS. However, much more is still needed to be done by the researcher, both KELMS and MVP administrators to ensure that KELMS is frequently used by MVP students, mentors, and facilitators in day to day teaching and learning processes at MVP program. KyU should continue to ensure LMS training is included on the timetable, conduct evaluation every semester and encourage teamwork among facilitators, students and mentors.

During the entire period of this research, Students and facilitators acquired digital skills and KELMS end-user skills. The stakeholders due to specified participatory set training objectives acquired good communication skills; teamwork, improved interpersonal relationship, regular reflection meetings, timely coordination and feedback were found to have been key instruments that resulted in the success attained.

The use of information and communication technology (ICT) tools including learning management systems (LMS) plays a vital role in enhancing students learning. The implementation rate of LMS in Kyambogo University is very promising. LMS helps to go beyond the traditional face-to-face classroom communication and provides an opportunity for the

students to acquire knowledge in their own pace and convenience. KELMS creates a virtual classroom in which the students can interact with the experts and teachers through video conferencing and other interactive mechanisms. This study sheds light to the level of usage of LMS in various educational institutions and reminds the need of technology enhancement in the teaching-learning process. Based on these benefits, LMS implementation in the institutions can be strengthened further to enhance efficiency. Technological advancements need to be seen as means to several potential ends, not just as ends in themselves.

Since action research is cyclic, the stakeholders should not relax after wiping out challenges but reflect on the second category of challenges that were identified; plan again, take action, implement, evaluate and reflect till when the challenges were minimized. This would lead to improve in KELMS use at Kyambogo University.

5.3 Recommendations

The following recommendations have been made based on the study findings:

- The MVP Program should be facilitated for solving the pending issues related to establishment of a Fully-User friendly KELMS and to ensure that KELMS is frequently used by MVP students, mentors, and facilitators in day- to- day teaching and learning processes at MVP program. KyU should continue to ensure that LMS training is included on the timetable, conduct evaluation every semester and encourage teamwork among facilitators, students and mentors. Kyambogo University should spearhead all reflective meetings which are key to improving situations and innovations in the LMS. Stakeholders should be facilitated to re-plan new strategies for solving the pending issues related to establishment of a fully-fledged KELMS and recruitment a resident full time KELMS administrator.

- Since action research is cyclical, stakeholders should be facilitated for another FW to revise the action points that were not done as per plan to improve on the existing situation for attainment of the anticipated lasting solution for study problem. The researcher believes that KELMS should be a platform for students, mentors and facilitators to discuss their ICT problems. If the platform is used to upload ideas, facilitating timetable

for MVP and this makes it very important for students; facilitators/ mentors, and administrators consult the system. The fresh KyU students, facilitators and mentors be introduced to KELMS from on-set. This makes them know that KELMS is part and partial of MVP.

- The MVP administration should include LMS on timetable so that every week there is facilitation on LMS so that skills acquired are practiced. It also makes it easy not to lose focus on KELMS. There should be frequent practical lectures on ICT so that mentors, facilitators and students can get more ICT skills. Timely feedback is a major key factor in motivating learning. There is a need to put in place an electronic evaluation and grading software system with various tools that are specific to stakeholders for purposes of evaluating not only the students but also the facilitators, mentors, students, administration and KELMS curriculum as a whole.

5.4 Study limitations

The opinions gathered from a small sample of team players may not have fully represented the view of the majority of practicing LMS experts who never participated in the study. This in turn could have affected the level of KELMS use to teach and learn. The limitation included the following:

- Limitation was that most facilitators were not having the system user rights to enrol their students into their course-units, and this made difficult to manage courses. It was observed that LMS hands on trainings were not reflected anywhere on the MVP timetable. It became very difficult to fix time to carry-out LMS learning sessions either with students, facilitators and mentors. Mobilizing stakeholders was costly in terms of funds and time as it was not easy to have them actively involved in all plenary sessions.
- As KyU is moving towards impressing use of LMS to enhance teaching and learning, some facilitators and mentors are uncomfortable to use LMS as they prefer traditional classroom method of lecturing students. This made the research even more difficult. The limited resources are shared and most of the time the researcher faced the challenge of organizing more LMS hands-on trainings to acquire LMS use skills.

- It was not easy to implement some of the activities in time, as MVP doesn't have resident KELMS administrator who should always be available (but was not) when problems arise.

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APPENDICES

Appendix 1: Introduction Letter of Kikonyogo Robert

KYAMBOGO UNIVERSITY

P. O. Box 1 Kyambogo, Phone: 041-285001/2 Fax: 041-220464
www.kyambogo.ac.ug
FACULTY OF VOCATIONAL STUDIES
Department of Art and Industrial Design
MASTERS IN VOCATIONAL PEDAGOGY PROGRAGRAMME

3rd November, 2018

…….
…….

RE: INTRODUCTION OF KIKONYOGO ROBERT

This comes to introduce to you KIKONYOGO Robert a student of Masters in Vocational Pedagogy (MVP) Programme at Kyambogo University. This student bears registration number 17/U/14850/GMVP/PE and in his final year. As a requirement for graduation, this student is expected to carry out Action Research through a collaborative process with world of work.

Any support rendered to him is highly appreciated.

Looking forward to your usual support.

Yours faithfully,

Chris Serwaniko
Coordinator, NORHED MVP Project
Masters in Vocational Pedagogy Programme

Appendix 2: Admission Letter for Master's Degree in Vocational Pedagogy Programme

KYAMBOGO UNIVERSITY

P. O. Box 1 KYAMBOGO
Tel: 0414 - 285037/287343 Fax: 0414 - 220464
Email: arkyu@kyu.ac.ug, Website: www.kyu.ac.ug

Office of the Academic Registrar

Date: 5th August 2017

Name: KIKONYOGO ROBERT
Reg. No: 17/U/14850/GMVP/PE
Student No: 171020014850

Nationality: Ugandan
Hall of Attachment: MANDELA
Year of Study: 1
Tuition: **2,200,000/= Per Semester**

Dear Student,

GRADUATE ADMISSION 2017/18 ACADEMIC YEAR

Iam pleased to inform you that you have been admitted to a programme of study leading to the award of Master in Vocational Pedagogy of Kyambogo University.

The duration of the Programme is two years. Your registration is by course work and research dissertation effective **5th August 2017** and expires on **2nd August 2019.** You will be required to enroll and register every semester upon receipt of satisfactory progress report from the faculty/school/institute. You shall be required to apply for extension of your registration (at a fee as may be applicable), in case you cannot complete in the stipulated time. It is mandatory that extension fees are paid before registering for an extension.

You shall be required to pay all relevant University dues as indicated on the fees structure at the back page. All payments are made through any of the **Stanbic/ DFCU/Eco bank** in Uganda using computer auto generated payment slip accessed from Kyambogo University website www.kyu.ac.ug.

You are expected to report and register within six weeks effective from **5th August 2017.** Please **NOTE** that your admission to this programme is provisional and subject to verification of your academic qualifications at the time of registration. Please bring your identity card/Passport and **three** photocopies of **all** your academic documents. The originals of all documents will be required for verification process.

Please also note that cases of impersonation, falsification of documents or giving false or incomplete information whenever discovered either at registration or afterwards, will lead to automatic cancellation of admission and criminal prosecution. Note that fees defaulters shall not be allowed to sit Examinations.

You are required to carefully study the information guide and University Research and Publication Policy and guidelines so as to comply with the provisions therein. Both documents will either be handed to you or downloaded from the Kyambogo University website www.kyu.ac.ug

I congratulate you upon admission to Kyambogo University; I extend my warm welcome and wish you success in your studies.

Yours Sincerely,

Dr. Peter Okello
AG. ACADEMIC REGISTRAR

Appendix 3: LMS competences required to improve use of KELMS

Kelms implementation in Relaying the Interaction among E-Learning Elements

No.	Relation	Relation
1	Student-student	chat, forum, email, assignment upload, blogging, profile, messaging, discussion, computer use
2	Student-KELMS content	download, search, view, create, assignment
3	Student-Facilitator/Mentors	chat, forum, email, message, tasks, assessment, results, computer use
4	Facilitators - Mentors	chat, forum, email, message, blogging, courseware development, computer use
5	Facilitator/Mentors - content	Upload courseware, view, create
6	Content-content	link files, indexing, assessment

Appendix 4: Action Research Work Plan 2018/2019

Activity	Oct 2018	Nov 2018	Dec 2018	Jan 2019	Feb 2019	Marc 2019	Apr 2019	May 2019	June 2019	July – August 2019	August – September 2019
Obtaining a letter of introduction Meeting workplace supervisors, HOD, HOS. identifying participants											
Permission to conduct study Visit and hold an interactive interview with world of work graduates and employers											
Meetings with stakeholders at workplace, planning, conducting future workshop											
Proposal writing and reading related literature											
Summing up, mock, presentation to panel, approval											
Implementation and follow up meetings											
Thesis writing, reading related literature											
Summing up. Validate results with stakeholders and evaluation											
Mocks, viva presentations. Final report.											
Submission of Thesis											
Graduation											

Appendix 5: Action plan to implement the best solutions

Task	Responsible officer	Resources	Roles	Measurement	Time frame
Set compulsory practical on KELMS	Facilitator and mentors	Internet access KELMS platform Note book Pen Personal computer Power	▪ Enrol students into their courses units ▪ Facilitate online ▪ Follow ICT and KELMS trainings ▪ Upload and download their courseware into the KELMS	▪ KELMS hands-on skills can be developed ▪ Knowledge how to facilitate through online ▪ Skills to acquire ICT knowledge	6 months
Uploads class activities in KELMS	Facilitator and mentors MVP Administrators Lead researcher	Personal computer Internet access Power KELMS platform Pen Note book	Facilitate KELMS and ICT Help students , facilitators and mentors	▪ Impart hands-skills to stakeholders ▪ Guide the stakeholder of issues related to KELMS and ICT	6 months
Lead researcher ensures course leader uploads courseware	Lead researcher	Personal computer Internet access Power KELMS platform Pen Note book	▪ Conduct farm visits ▪ General facilitator of the research process. ▪ General mobilization of all stakeholders ▪ General monitoring and evaluation ▪ Make a final documentation for record purpose ▪ Motivation of participants ▪ Provision of extension services- trainings	Observation Interviews	6 months
Lead researcher to ensure active use of KELMS by student	MVP Cohort VII Student	Personal computer Internet access Power KELMS	▪ Individual trainings ▪ Individual trainings ▪ Update their profile on the KELMS platform	▪ Knowledge how to facilitate through online ▪ Skills to acquire ICT	6 months

		platform Pen Note book	▪ Upload and download their tasks into the KELMS	knowledge ▪ KELMS hands-on skills can be developed	
Involve technical persons in use of KELMS	MVP Administrators	Internet access KELMS platform Note book Pen Personal computer Power	▪ Procure ICT gadget ▪ Recruit KELMS administrator ▪ Recruit MVP students ▪ Reward mentors/facilitators who use KELMS	▪ Acquire ICT and KELMS use skills ▪ Change altitude towards ICT ▪ Improve digital literacy	6 months
Provide LMS gadgets	MVP Administrators	Internet access KELMS platform Note book Pen Personal computer Power	▪ Procure ICT gadgets	▪ Acquire ICT and KELMS use skills ▪ Change altitude towards ICT ▪ Improve digital literacy	3 months
Ensure KELMS accessibility and flexibility	KELMS administrator	Internet access KELMS platform Note book Pen Personal computer Power	▪ Enrol students and mentors ▪ Facilitation/trainings on LMS for the mentors/lecturers to enable them use LMS ▪ Help update profiles for some KELMS users ▪ Improvement in the infrastructure and technical support ▪ Offer technical support ▪ Training (capacity building) for mentors and students ▪ Update the KELMS	▪ Change altitude ▪ Encourage student or facilitator to love online learning ▪ Interviews	3 months

Appendix 6: Budget

Item	Quantity	Unit cost	Amount
Future workshop 1	1	700,000/=	1,400,000/=
Communication Airtime (Communication)	6 months	600 ,000/=	600,000/=
Stationery	3 reams	20,000/= @	60,000/=
Log book	2	20,000/= @	40,000/=
Photocopying, Printing a proposal	3	50,000/= @	150,000/=
Flip chart	50	1,000/= @	50,000/=
Markers	20 pcs	4,000/= @	80,000/=
Cell tape	3	5,000/= @	15,000/=
Purchase of a Laptop computer	1	3,500,000/=	3,500,000/=
Evaluation Meeting	2	700,000/=	1,400,000/=
Future Workshop 2	1	1,000,000/=	1,000,000/=
Total cost			**8,295,000/=**

Appendix 7: Interview guide to assess the improvement in KELMS

Section A: Digital Illiteracy

i. What role do you have in the KELMS activities?
ii. Were you assigned a role?
iii. Which form of support do you receive?
iv. Before executing the tasks assigned to you how do you know what is required?
v. Do you receive comments about the KELMS usage/task accomplished?
vi. Professional ethics (what is your comment about the conduct of administrators, students and facilitators in KELMS use?)
vii. Rate the KELMS and challenges?
viii. Lecturers should be practical oriented (is ICT /KELMS facilitation practical?)

Section B: Administration

Students

i. How many students are you in this MVP Cohort Seven?
ii. Who is your group leader?
iii. How was the leader selected/ chosen?
iv. What roles does the group leader play during the ICT/KELMS facilitations?
v. What is the reporting mechanism between MVP, KELMS administrators and facilitators about your ICT/KELMS learning activities?
vi. In case of uncertainty who do you communicate to and how?
vii. During this practicum you learn by doing, can you talk about how tasks are assigned?

Mentor /supervisor

viii. How did you get these learners assigned to this unit?
ix. What is the link between you, KELMS administrators and facilitators and mentors?
x. Is there any form of accountability required?

Administrators, Students, Mentors/Facilitators/Lecturers

KELMS administrator

i. How do students and facilitators get involved in KELMS use?
ii. Who would you rate the abilities of your learners?
iii. Which aspects of the program have they showed mastery?
iv. Is there any improvement in KELMS use?
v. Has supply of new ICT gadgets help to improve KELMS use?
vi. Competence of both students, mentors and facilitators

Mentors, facilitators and MVP Cohort Seven Students

Section C: Poor Attitude

i. What challenges with use of ICT?
ii. What is your impression about KELMS platform?
iii. What is your comment about LMS gadgets at MVP? (consumables, tools, and safety)
iv. What have been your best learning moments with KELMS?
v. Point out the weakness encountered in the KELMS use that has affected your ability to learn or changed your attitude.
vi. What is your opinion about use ICT to facilitate learning?

Mentor /supervisor(s)

i. How do you comment on the learners' attitude in general terms towards KELMS use?
ii. What do you have to say about KELMS management?
iii. Are you able to upload and download your activities and courseware into KELMS?

Appendix : Table 8: Work process analysis in the production of LMS

	University Admission Office	**Reception at the Department (s)**	**Facilitators**	**Head of department**	**System Administrator (ICT Department)**
Activities	-Recruit Students -Communicate with new students -Answers questions about the university -Evaluates potential applicants -Maintain appropriate records, including details of student enquiries, applications, interviews Guidance for students	-Issuing, storing and receiving of student documents -Direct new students where to get offices at the University -Deal with general and specific enquiries Welcomes Students -Co-ordinating and maintaining information resources -Point of information dissemination -Take notes in meetings -Write a reports	-Enroll Student -Develop Content -Manage their courses Set Tests -Mark tests and examination -Award Marks -Assign tasks -Upload the course content -Print the results -Marks the attendance -Participate in course content development -Compile tasks -Submit results to Kyambogo University administration -Present tasks -Interact with course facilitators -Receive feedback on tasks -Attend to feedback	- Verifies the curriculum content that is loaded into the system - Ensures good management of the LMS - Participate in course content development - Compile tasks Submit results to Kyambogo University administration -Present tasks -Interact with course facilitators -Receive feedback on tasks -Attend to feedback	-Enroll students -Assign Username and Password -Introduce new lecturers into LMS -Solve registration problem -Solve registration ion problem -Interact with course facilitators -Receive feedback on tasks -Attend to feedback

Tools and materials	-Good internet connection -Power source -Laptops -Flip charts -Markers -Pens -Phones Books -Papers	-Good internet connection -Power source -Laptops -Flip charts -Markers -Books -Papers -Pens -Phones	-Good internet connection -Power source -Projectors -Laptops -Flip charts -Markers -Pens -Phones Books -Papers	-Good internet -connection -Power source -Projectors -Laptops -Flip charts -Markers -Pens -Books -Papers -Phone	-Good internet connection -Power source -Projectors -Laptops -Flip charts -Markers -Pens -Phones -Books -Papers
Competences	-Ability to plan -Research skills -ICT skills -Communication skills -Teamwork spirit -Report writing skills -Communication skills -Presentation skills -Time management	-Ability to plan -Research skills -ICT skills -Communication skills -Teamwork spirit -Report writing skills -Presentation skills -Time management	-Ability to plan -Research skills -ICT skills -Communication skills -Teamwork spirit -Report writing skills -Presentation skills -Time management -Curriculum Development Skills	-Ability to plan -Research skills -ICT skills -Communication skills -Teamwork spirit -Report writing skills -Presentation skills -Time management -Curriculum Development Skills	-Ability to plan -Research skills -ICT skills -Communication skills -Teamwork spirit -Report writing skills Presentation skills -Time management - Curriculum Development Skills -Multimedia Skills
Quality assurance	- attain the pass mark for admission -Has the required subjects for admissions	- Coordinates Lecturers few -Computers are installed with Antivirus -100% participation Submission of reports	-Creation of Username and Password -Course LMS Coordinator -Lecturers few -Computers are installed with Antivirus	-Creation of Username and Password -Course LMS Coordinator -Lecturers few -Computers are installed with -Antivirus	-Creation of Username and Password -Course LMS Coordinator Lecturers few -Computers are installed with Antivirus -100% participation -Submission of reports

			-100% participation -Submission of reports	-100% participation Submission of reports	

Appendix 9: Gaps that were identified during the Future workshop session

Gaps	Ranking			
	1	2	3	4
Fear to use technology (phobia)	1			
No local systems administrator at NOMA			3	
Require a lot of time that lectures don't have		2		
Poor infrastructure			3	
Poor attitude towards use of technology in teaching and learning		2		
Poor perception (it is difficult)		2		
Insufficient technical support			3	
Lecturers do not upload activities into the LMS	1			
Lack of seriousness		2		
Poor implementation	1			
Lack of local content	1			
Digital illiteracy among lecturers	1			
Inadequate training				
Willingness to engage in LMS technology/ICT				
Course leaders are inactive to prompt other mentors upload their content				
Deliberate us of the system is not functioning				
Little Knowledge of Information Communication and Technology (ICT) for students	1			
Insufficient time for students		2		
Bureaucratic management System			3	
External Factors				4
Poor self-motivation among students			3	
Not practically assessed			3	
Poor follow-up				
No content	1			
Inactive course leader			3	
No link between training and practice for mentors	1			
Rigidity to certain ways of work		2		
Human and tool (Teaching and Learning Methods culture)				

Appendix 10: Pair wise Ranking was used to group critical gaps for action

Fig. 1.4. Pair wise Ranking

	1	**2**	**3**		**Total Tally**	**Ranking**
1					2	2
2	1				1	3
3	3	3			3	1

Appendix 11: Informed Consent Form

Consent form for participation in action research at Kyambogo University

I accept to take part in this action research project by Mr. Kikonyogo Robert and I know that it is about improving his practice in improving the use of digital literacy by teaching staff at Kyambogo University on the E-Learning Management System (KELMS).

1. I have been briefed that my participation is voluntary in which case I will not be paid.
2. I know that I can withdraw my participation at any time without consultation with the main researcher.
3. I have been told that participation will involve being interviewed and that's alright with me.
4. I have accepted the researcher to take my photos and where necessary use them in his writings.
5. Am aware that my names will remain anonymous and the information I give will be confidential and for academic purposes only.
6. The researcher has explained the objectives. These include: i) To design appropriate strategies to improve usage of KELMS and digital literacy, ii) To implement the developed strategies, iii) To evaluate the strategies aimed at improving the use of KELMS to support teaching and learning processes
7. I am aware of the study's significance and scope to me and I have no problem.
8. I have been told to request for this form after filling it, in case I need another one.

Signature of participant……

Date …….

Signature of researcher…….

Date …….

Appendix 12: Kyambogo University End-User Login Interface