Online Repositories in Peer Based Learning: A case study of teacher Competency - based curriculum training workshops in Marsabit County, Sololo Sub-County, Kenya.

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Abstract- This study sought to establish the role and impact of online repositories in peer-based learning and conducted a case study of the competency-based curriculum teacher training workshops. The specific objectives of the study were: to determine the challenges of traditional repositories in peer-based learning, determine the benefits of online repositories, establish factors affecting the adoption of online repositories, develop and validate an adoption framework for online management system in peer-based learning. The study adopted a descriptive research design and purposive sampling was used to collect data from thirty-two teachers who had successfully attended CBC training workshops using an online google questionnaire with open and closed-ended questions. Data was presented using tables, graphs and pie charts and analysed using frequencies. The findings from this study revealed that online repositories play a very crucial in the acquisition of information, knowledge, skills and professional growth in peer-based learning. The study also found out that peers are willing to adopt online repositories if ICT infrastructure in availed.

Index Terms- adoption, ICT, CBC, online repositories, peers.

I. INTRODUCTION

This chapter briefly discusses ICT, online repositories and peer-based learning. In our current information age, Information Communication Technologies (ICT) has a vital role in the cognitive processes' transformations in the society. Holistically, ICT and its integration in education provides the much-needed foundation and anchorage to all the other spheres of life. ICT has revolutionised the creation, manipulation, storage, communication and dissemination of information in its various forms through the network of computers and other technological devices such as mobile phones and applications. It is this revolution of knowledge transmission that has transformed the traditional face-to-face teaching and learning activities through various technological channels and repository systems. Scherer and Valen (2019) define a repository as a 'dynamic service and tool.' Online repositories which are software archives are an enriched data location where multiple databases can be accessible to a user and form a valuable source of information to users. Online repositories in peer-based learning have transformed the traditional face-to-face teaching learning activities with peers engaging more in technologies that minimise the constraints of 'time, place and situational barriers.' Beach and Willows (2017). Traditionally, peer-based learning is a learning strategy employed by teachers as an instructional design where learners are encouraged to form groups and deliberate on provided topics to come up with their findings, become active participants and engage in group work. Moreover, traditional face-to-face teaching and learning activities have tended to have their repositories in

the traditional formats of note taking, records in worksheets, handouts, recitations and memorizations. These methods though adequate are cumbersome and may not essentially capture all the information learnt and fall short of an excellent repository. Turbill (2015) sees the transformation of traditional face-to-face teaching to the adoption of ICT technologies and online repositories for peers as having immense benefits such as collaborative learning and opportunities that try or apply new practices. NETP17 (2017) discusses that 'digital learning tools can offer more flexibility and learning supports than can traditional formats. Using mobile devices, laptops, and networked systems, educators are better able to personalize and customize learning experiences.'

With these advances in ICT, peers in teaching learning activities are embracing these benefits in their day to day quest for knowledge and skills enhancement.

Background to the Research

Globally, provision of cognitive, psychomotor and affective domain skills is a hallmark for development in developing countries. Governments endeavour to invest in their human capital by offering life-long learning to its citizens. This is in commitment to having literate and contemporary informed citizens in education, socioeconomics, socio-political and technological advancements. Kenya has made and continues to make immeasurable efforts in the investment of its human capital. This is in assertion with the UNESCO (2014, 2018) report which asserts that education should be recognized and promoted as a life-long right enabling individuals to continuously develop key competences to become active and informed members of a global society. Peer-based learning with its inclination to life-long learning necessitates this threshold for continued learning, skills acquisition and development of the human capital.

In the contemporary information age, the availability of information communication technology (ICT) and its surrounding technologies has seen tremendous improvements in teaching learning activities. Chen et al (2019) shows that studies have reported immense positive results in the quality, diversity and interaction awareness when online repositories are used in peer learning. This resonates well with what Beach and Willows (2017) discuss regarding teachers'(peers) cognitive processes during online professional learning that online learning is a favoured approach to professional development because it creates accessible opportunities, has positive effects on and even changes teachers' (peers) pedagogical and content knowledge, classroom practice and student outcomes. Sanchez-Garna et al (2018) quoting Pack (2003) assert that ICT can motivate learners and prepare them face new social challenges in ways that traditional methods have been evidenced to fail. This is agreement with the findings of Martin et al (2019) that ICT and its technologies do offer a holistic learning environment.

Cohen et al (2013) discuss that the implementation of a contextualized peer online repository as opposed to the global repository openly available online increases the use of learning materials in specific contexts such as schools. The research also found out that teachers (peers) in Israel often prefer to use local contextualized online repositories developed within their own contexts to suit their learning environments and specific needs which greatly enhance community collaborative learning.

Greenhow and Lewin (2015) confer that online repositories in American and Europe have and continue to play a crucial role in supporting peer learning. This they assert is realised when there is an embedment of various media technologies such as the incorporation of blogs and wikis; bookmarking tools, collaboration tools such VoiceThread and media that use video sharing. There are other examples such as LiveJournal which was created in 1999. LiveJournal continues to evolve and with time has included teaching (T-LJ) which is based on a blog technology where active professional topics are discussed daily.

Shonola et al (2016) report that in Nigeria, the use of emerging technologies in portable devices such as mobile phones are being used to support peers in blended learning (face-to-face and mobile apps).   Shonola et al (2016) quoting Moses (2014) add that Nigeria is ranked among the largest mobile markets in Africa. The use of mobile technologies therefore has greatly aided peers in communication, data sharing and discussions anywhere and anytime thereby providing the much-needed scaffolding to peers.

The case study of the Competency-based curriculum teacher training workshops in Marsabit County, Sololo Sub-County, Kenya

The Kenya Institute of Curriculum Development (KICD) in its commitment to keep teachers abreast with the contemporary trends in education in collaboration with relevant teacher organisations affords teachers (peers) professional, personal enrichment and growth through workshops. When teachers attend a face-to-face training workshop, post workshop always requires that they integrate what has been learnt in their teaching activities. Teachers need time to reflect on what has been learnt and this calls for adequate time and support. Support can be enhanced within an online repository environment where teachers can engage in meaningful activities, collaborate with other peers, exchange ideas, provide feedback to their peers and get professional support from the experts (tutors). Online repositories can act as a post-workshop follow-up offering the much-needed scaffolding that teachers require professionally.

Statement of the problem

Peer learning with its tenet to life-long learning requires the adoption of ICT and its technologies as a means of offering teachers' professional development. In Kenya, emphasis has been put on digital repositories such as national, research and institutional. These digital repositories play a significant role in the dissemination of knowledge albeit do not meet the unique contextualisation of content that peer-based learning requires. This research therefore sought to find out the role and impact online repositories would have in peer-based learning and the research is guided by the questions:

- Which ICT infrastructure is available in peer-based learning?
- What hinders the adoption of online repositories?
- What measures can be taken to enhance the availability of online repositories?
- How can a framework be adopted to manage online repositories in peer-based learning?

Research Objectives

The objectives of the research are:

i.   To determine the challenges of traditional repositories in peer-based learning.

ii.   To determine the benefits of online repositories in peer-based learning.

iii.   To establish the factors affecting the adoption of online repositories in peer-based learning.

iv.   To develop and validate an adoption framework for online management system in peer-based learning.

Scope of the research

The research will focus on teacher training workshops in the competency-based curriculum conducted by the KICD in Marsabit County, Sololo Sub-County, Kenya. Tutors and tutees who have attended workshops will be invited through an online google questionnaire which will be sent via a google link and shared through a WhatsApp group, to share their experiences through an invite only attendance. The researcher will be the sole administrator of the WhatsApp group. The findings thereof can be used with other studies to generalize and recommend ICT solutions to peer-based learning.

Significance of the study

This research plays a crucial role in understanding the underpinnings of the big 4 agenda in Kenya whose aim is to enhance manufacturing, food security & nutrition, universal health coverage and affordable housing. These agendas are founded and supported by the premise that education and ICT with its surrounding technologies will help deliver these agendas. The Sustainable Development Goals in particular goal number 4 is articulate in its endeavour to ensure inclusive and equitable quality education and promotion of lifelong learning opportunities for all. This resonates well with the Mission statement of The Kenya Institute of Curriculum Development (KICD) which seeks to provide research-based curricula and curriculum support materials responsive to the needs of the society. Kenya Vision 2030 has a pledge through its 4 pillars in specific the social pillar to invest in the people of Kenya through the transformation of among the eight key social sectors education by committing to: establish education management information system (EMIS) centres, provision of laptops and the integration of ICT in teaching and learning. Africa in Agenda 2063 commits herself in Aspiration 1 to have well educated and skilled citizens in all spheres notably in science, technology and innovation by improving the ICT infrastructure.

The findings of this research will contribute immensely to the existing data available from other studies done in ICT and to future researchers. It will also help seek ICT solutions in peer-based learning.

II.   LITERATURE REVIEW

This section looks at the literature review of information and communication technologies in peer-based learning.

Introduction to Literature Review

Peeters (2016) study of developing learner autonomy through Facebook: problem-solving dynamics in online peer collaboration found out that through online collaboration in a closed social network forum peers exercised control over content, were able to introduce new personal learning problems to the community of learners, peers provided solutions and were able to synthesize new information, shared personal learning experiences, took ownership of their learning and were able to construct an effective online support network.

Mwangi and Khatete (2017) research in Kenya shows that when it comes to teachers' ICT professional development needs, teachers need to interact with their peers to support each other and that even though there is a percentage of teachers who are already interacting with peers through blogs such as '*iLearn Technology, Emerging EdTec and Educational Technology Debate'* these come with the challenge of being hosted abroad and the content shared foreign which alienates the teachers. This finding is in line with the findings of Cohen et al (2013) which found out that teachers in Israel preferred to use their own contextualised online repositories for professional development. Mwangi and Khatete recommend that teachers be given opportunities to create professional learning networks for sustainable professional opportunities and growth and this trajectory can be enhanced online delimiting the constraints of cost, time and space seen in traditional repositories.

Mafa (2018) in researching on the adequacy of google classroom as a teaching and learning tool among higher education science training learners discusses the numerous advantages of google classrooms ranging from: it's a free web 2.0 tool based leaning management system that permits the formation of private classes and groups through an invite and welcome strategy which locks out interlopers guarantying protection to the group, it can be downloaded free on a mobile device. The research concluded that when learners are distant from everyone else, through utilization and help of the google classroom, they have their own opportunity to learn and comprehend ideas effortlessly without a push. The research further recommended that higher education institutions should give portable technology gadgets or potential mobile devices to their learners to explore this internet inclining tools since it encourages learning 24/7 beyond classroom contacts.

Adebayo (2019) in discussing teacher professional development and citing practices in other countries shows that internet and web-based communication technologies are being used to support teacher's on-going professional development for instance in the United Kingdom where Virtual Teacher Centre (http://vtc.ngfl.gov.uk) website provides a "Career Development" area which provides a variety of learning and teaching resources and links to support teachers continuing professional development. To add to this is the Teacher Net UK which is an independent professional association for teachers. These online repositories are used for blended learning (face-to-face and online).

From the reviewed literature review, it is evident that peer-based learning has experienced a paradigm shift and has embraced ICT and its surrounding technologies.

Theories that support the research

This research will be supported by the theories: social constructivism by Lev Semenovich Vygotsky and Technology Acceptance theory by Fred Davis. Social constructivism as advocated by Lev Semenovich Vygotsky (1896-1934) sees an interaction of cognitive processes and other people in the society. Palincsar (1998) in Woolfolk (2001:44) show that 'these social interactions are more than simple influences on cognitive development – they actually create our cognitive structures and thinking processes.' Vygotsky (1978:57) quoted by Woolfolk (2001:44) additionally note that functions in learner's cultural development usually appear twice: first on the social lever and later on the individual level; first between people (inter-psychological) and then inside the learner (intra-psychological). Woolfolk (2001:44) emphasises that 'higher mental processes appear first between people as they are co-constructed during shared activities. Then the processes are internalized by the learner and become part of that learner's cognitive development.'

This theory is found applicable in this research as social constructivism theory demonstrates that learners internalize concepts through social interactions and being actively involved in various activities using linguistic capabilities and cultural tools in varied social contexts. The implications of Vygotsky's social constructivism theory in peer based learning are: peers need participatory learning and require learning tools to manipulate the learning process, the zone of proximal development necessitates the use of a more advanced and collaborative peer and scaffolding is realised by the regular and ongoing support necessary for learning and professional growth. ICT has become and is a cultural tool used to manipulate the learning environments and is extensively used in scaffolding. Álvarez and Cuesta (2012) quoting (Graesser et al.,2000; and Reiser, 2002), show that scaffolding is also seen as a primary strategy to support interaction and learning processes that includes the tools, strategies, and guides used by human and computer tutors, teachers, and animated pedagogical agents during learning.

Technology Acceptance Theory

Developed by Fred Davis in (1986), Technology Acceptance Theory discuss Allomary & Woollard (2015) is a 'predictive and explanatory model geared towards factorizing users' acceptance, rejection and integration of technology. Of prominence are the two key elements namely, perceived usefulness and perceived ease of use.' Li (2010) in says that 'Perceived usefulness is the degree to which a person believes that using a particular system would enhance his or her job performance.' Korpelainen (2011) asserts that these two behavioural beliefs; perceived usefulness and perceived ease of use usually lead to individual behaviour intention and actual behaviour and that perceived usefulness is the strongest predictor of an individual's intention to use an information technology.

This model gives an in-depth contribution to understanding ICT usage and acceptance behaviours in the adoption of different technologies. Allomary and Woollard (2015) assert that TAM provides a 'robust model applicable across a broad range of end-user computing technologies' especially so in the use of technology in learning environments.
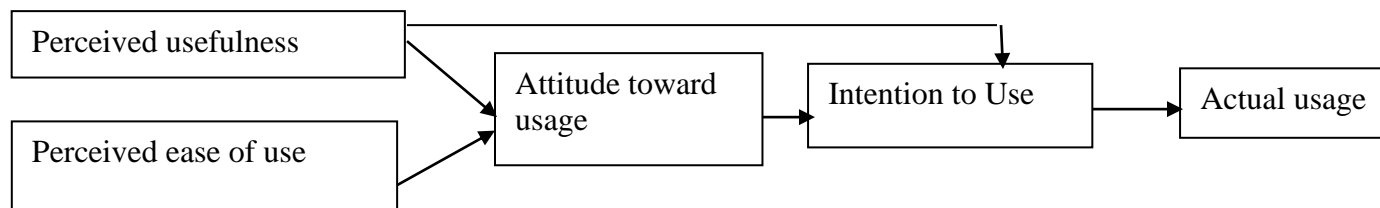

Fig 1. Technology Acceptance Model (TAM) Davis et al (1989)
Source: Allomary and Woollard (2015)

Traditional challenges of repositories in peer-based learning

Traditionally, repositories are in form of note taking, printouts, handouts, memorizations and recitations. These come with many challenges. Note taking and writing down learnt material consumes a lot of time in comparison to typing, audio recordings and video conferencing. This makes traditional repositories cumbersome in nature.

The availability of a printouts and handouts for information does not necessarily imply that all the content therein is required by a user. This bulkiness of printout can deter peers from using traditional repositories when compared to digital repositories where one sifts and accesses the information that they require at any given time and wherever they are limiting the constraints of time and space.

More often traditional repositories limit the access of information with many incidences of either loss or lack of the needed content.

When it comes to currency of content in traditional repositories, one of the challenges experienced is the lag in time to renew and upgrade content. This is because it takes time to deposit, verify, edit, print and physically distribute content using traditional mediums.

Memorization and recitation of content comes with the challenge of peer idiosyncrasies which can present the risk of misinformation, disinformation and unavailability of data.

Benefits of online repositories in peer-based learning

Online repositories offer peers the opportunities for collaborative learning in small manageable groups. It encourages sharing of knowledge and involves peers exchanging knowledge, ideas and experiences with each other and diffusing this learning in their day to day experiences.

Input of new knowledge through a variety of media makes online repositories beneficial to peers. This is made more attractive by technology that allows and provides opportunities to try and apply new practices.

Continued knowledge upload by peers' contributions and questions raised thereof creates an avenue where peers can reflect on their own learning, take more initiative and control of their learning.

Online repositories offer a forum for peers to share knowledge and interact with each other without the constraints of space and time. Moreover, contextualisation of knowledge shared makes it easier for peers to make use of the shared knowledge.

Ongoing and regular support is essential to support peers learning and this can effectively and efficiently be facilitated through the use of ICT's.

Online repositories provide high quality and diversified content. This sets a premise for continued update and upgrade of content usually peer reviewed which make it a preferred knowledge currency repository.

Factors affecting adoption of online repositories in peer-based learning

The lack of and insufficient Information and Communication Technology infrastructure is seen as inhibiting the adoption of online repositories. Access to computers, updated software and hardware as well as all the periphery technologies is paramount in the adoption of ICT and when these key elements are lacking, adoption is crippled. Lack of internet connectivity, lack of electricity as well as frequent electricity interruptions negates this adoption. Waiti (2018) notes that inadequate funds, poor connectivity to electricity and inadequate ICT materials hamper the adoption of ICT in schools. Insufficiency is realised when there is a lack of technical support to continuously avail new technological trends as well as offer routine repairs of ICT infrastructure and give maintenance to the system. Technical support plays a crucial role because peers who may be deemed tech savvy may be grippling with issues of technological characteristics   as discussed by Rogers (2003) such as; innovation attributes, relative advantage, compatibility, complexity, triability and observability which determine the rate of adoption by a peer.

Peers perceptions and attitudes towards ICT and its technologies greatly influence their acceptance to use it. To what extent a technology is useful in one's daily life and its ease of use determines its adoption. Davis (1986) asserts that it is the perceived usefulness and perceived ease of use of a technology that determines its acceptance, hence, it is very important to offer technical support to peers so that they can keep pace with technological advancements.

Osadebe and Ojukonsin (2018) discuss that lack of sufficient ICT sensitization can greatly affect the adoption of ICT and its technologies, notwithstanding, quoting the African Symposium (2011) shows that 'teachers need to be sufficiently competent to make personal use of computers, to make use of information and communication technology as a mind tool, to become master of a range of educational paradigms that use ICT and also to become sufficiently competent to make use of ICT as a tool of teaching learning activities.'

The cost of ICT and all its peripheral devices can deem expensive. Peers may find ICT devices such as smartphones, iPhones, laptops and tablets expensive to purchase and maintain. The continued daily purchase of internet bundles can prove too costly especially so when there is no common open and secure wi-fi network. Andae (2019) notes that the cost of internet in Kenya remains expensive with many citizens spending an estimated 3.1 percent of their average monthly earnings to purchase a one gigabyte (GB data) which is above the standard two percent; globally internet affordability is defined as 1GB mobile data costing no more than two percent of average monthly income. Overall, the high cost of acquisition and maintenance of ICT infrastructure is a challenge that constraints the adoption and implementation of ICT.

Online repositories require time and effort. This can pose as a challenge and as Harris and Sandor (2007) show 'online repositories in peer-based learning may deem extremely demanding on the trainer or tutors time with limited reward or recognition for effort.' This is partly because the repository nature may require time outside the structured formal learning time to deposit and engage in. Teachers are required to make a conscious effort to avail time outside the formal teaching hours to engage with their peers for professional development.

Policy plays a crucial role in the adoption of ICT. The Kenya Education Network (KENET) (2014) in discussing Kenya's national ICT policy whose vision and mission is to have a prosperous ICT driven Kenyan society and improve the livelihoods of Kenyans by ensuring the availability of accessible, efficient, reliable and affordable ICT services insists that there is need to update the ICT policy in tandem with the other undertakings and development goals that the government may have for example Kenya's Vision 2030.

Other authors related works and findings

Cohen et al (2013) found out that peers often prefer to use contextualized online repositories as these meet and suit their learning environments and specific needs. The study further notes that although institutional repositories are availed for storage and access of teaching and learning materials, this does not adequately meet the specific peer community needs.

Liu and Chuang (2016) in a research conducted in Taiwan where google classroom was used in integration of peer tutor mechanism for 6th grade students found out that there was a high degree of positive perception regarding the use of google classroom for peer tutoring in and out of the classroom.

Chepkorir and Kandiri (2018) conclude that when it comes to teachers' professional development, training through seminars/conferences during in-service courses does not give enough time for teachers to internalize well what has been learnt more so in ICT where professional teachers support is strongly advocated. The study further recommends that there is a need for teachers to have their personal initiatives towards the available digital learning tools so as to enhance the teaching learning process and their professional development.

Chen, Lei and Cheng (2019) quest to find out if peer facilitated online discussions had effects on the positive overall cognitive processes of peers and to what extent in terms of : characteristics, patterns and techniques, found out that in a peer facilitated online environment, learners demonstrated higher level cognitive presence in: triggering where learners explicitly express their feelings; exploration using brainstorming, information search and exchange of ideas; integration and synthetization of relationships; resolution where actuality of learned information is applied. This research shows that regardless of the content being learnt peers require support in their everyday learning and that peer facilitated online repositories play a crucial role in this support.
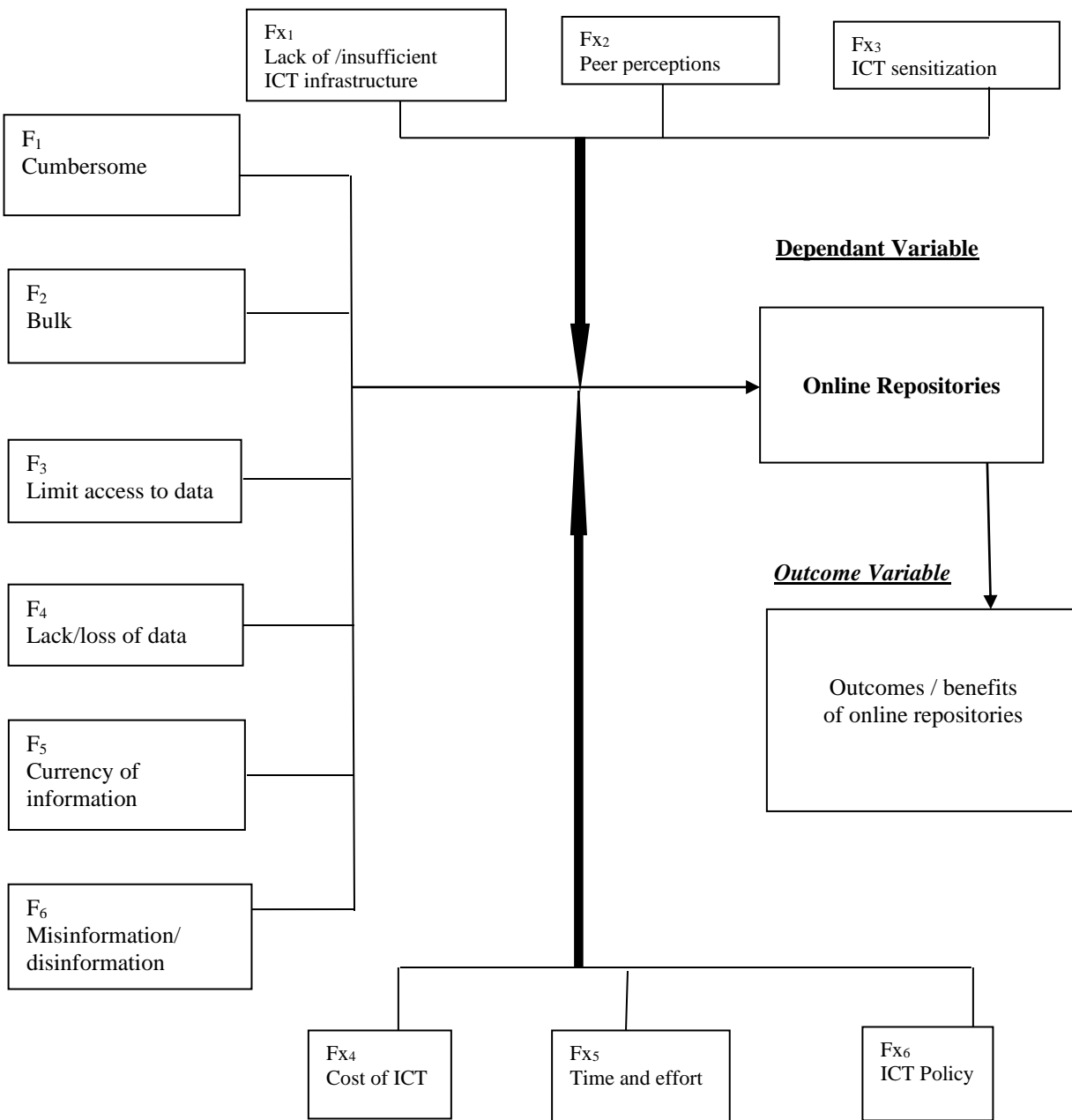
Research Gap

The challenges that peers have in repositories emanate from the traditional repository set ups which are not peer personalised, contextualized and with a degree of formality required for learning. These challenges can be mitigated through the use of ICT and its diverse technologies through online repositories to help peers' access, store, upload, reflect and share information.

2.8.1   Conceptual Framework

A repository is a place where multiple databases or files are located and managed for distribution over a network. Emmytone et al (2018) quoting Bonilla-Calero (2013) discuss a repository as a set of services offered in order to manage, disseminate and facilitate access to documents. Maithya et al (2013) says that a conceptual framework is a 'representation of a researcher's conceptualization of the relationship between variables in the research which is shown diagrammatically.' It is the description of concepts in a research and the mapping of the relationships among variables.

Challenges of traditional repositories
Independent Variable (F)

Adoption of online repositories
Factors affecting (x)
Intervening variable

Fx$_1$ Lack of /insufficient ICT infrastructure	Fx$_2$ Peer perceptions

Fx$_3$ ICT sensitization

F$_1$ Cumbersome

F$_2$ Bulk

F$_3$ Limit access to data

F$_4$ Lack/loss of data

F$_5$ Currency of information

F$_6$ Misinformation/ disinformation

Dependant Variable

Online Repositories

Outcome Variable

Outcomes / benefits of online repositories

Fx$_4$ Cost of ICT

Fx$_5$ Time and effort

Fx$_6$ ICT Policy

III. RESEARCH DESIGN AND METHODOLOGY

This section presents the research design, target population, the procedure followed in data collection and the techniques used in data analysis.

Research Design

The research will conduct a case study. Zainal (2007) says that case study research 'allows the exploration and understanding of complex issues and can be considered a robust research method particularly when holistic, in-depth investigation is required. It enables a researcher to closely examine the data within a specific context.'

The research will also adopt a descriptive approach as it seeks to identify, determine, describe, explore relationships and articulate the objectives of the research. A descriptive research design involves collecting information from a sample of individuals by interviewing and administering a questionnaire whose findings allows generalizations. A questionnaire will be used in this research.

Target Population

Population refers to the group from which a sample is taken. The target population comprised of teachers who have attended competency-based curriculum (CBC) training workshops in Marsabit County, Sololo Sub-County, Kenya. These are peers whom the need for online repositories is central in teaching learning activities and outcomes in their everyday professional development.

Sampling Technique

Purposive sampling technique was adopted. Maithya (2019) notes that purposive sampling allows the researcher to use cases that have the required information with respect to the objectives under study. This is because the subjects are deemed informative and have the requisite characteristics.

Data collection procedure

The data were collected from 32 teachers who had successfully attended the competency-based curriculum workshops conducted in Marsabit County, Sololo Subcounty, Kenya using an online google questionnaire designed to investigate the role and impact of ICT in peer-based learning. This population (32 respondents) constitutes 66.6% of the total sample population (48 online questionnaires) that responded to the online questionnaire which according to Van Dalen (1979) is sufficiently above the 20% recommended for educational descriptive research. The questionnaire had 13 items. These items were both open and closed ended. To ensure that the questionnaire measured the intended constructs and met face and validity threshold, it was submitted to the study supervisor for evaluation in terms of content clarity, coherence and relevancy. His contributions and recommendations were used to improve the questionnaire prior to administering. The questionnaire was administered through a WhatsApp group forum where the invited participants opened the sent link to access the questionnaire. A single participation per invitee was allowed.

IV. RESULTS AND DISCUSSION

Table 1.   Respondents Biodata

Age group (yrs.)	Gender		frequency	Percentage
	Male	Female		
20-30	6	3	9	28.1%
31-40	8	5	13	40.6%
41-50	5	4	9	28.1%
51 and above	1	0	1	3.2%
Totals	*20*	*12*	*32*	*100%*

Source: Questionnaire

From table 1 there were a total of 32 respondents (100%) of whom 20 (64.5%) were of the male gender and 12 (35.5%) were female. 9 (28.1%) were in the age bracket 20-30 years. 13 (40.6%) were in the age bracket 31-40 years. 9 (28.1%) respondents were in the age bracket 41-50 years and 1 respondent (3.2%) was 51 years and above. Majority of the respondents were in the age bracket 31-40 years (40.6%).

To answer research objective one that sought to determine the challenges of traditional repositories in peer-based learning the respondents were asked if they do receive post workshop support, a total of 29 respondents responded to the question as indicated in table 2.

Table 2. **Post workshop professional support**
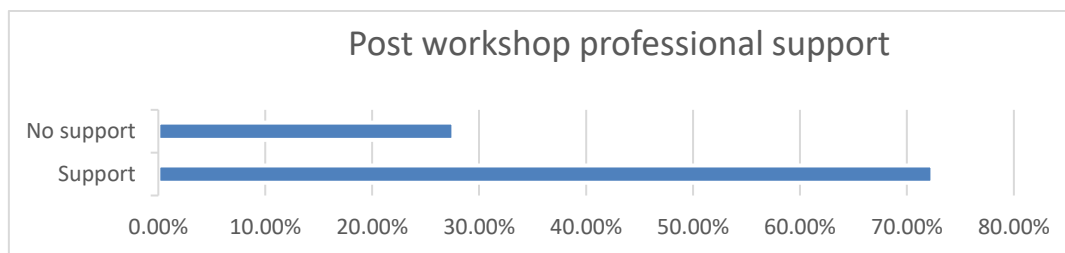
Source: Questionnaire

21 (72.4%) of the respondents affirmed that they do receive post workshop professional support whilst 8 (27.6%) did not receive any post workshop professional support. Of the respondents who do receive post workshop professional support, the following as sources of support were cited: 'Coordinators, Curriculum support officers (CSO), Sub-county education directors, WhatsApp groups, internet, peer teaching where teachers transfer skills to each other, and headteachers who avail teaching learning materials.'

When asked what challenges are faced in competency-based curriculum training workshops in terms of repositories, 30 respondents responded as observed in table 3.

Table 3. Challenges to traditional repositories

Item	N	%
Bulk handouts and printouts	18	60
Loss of data post workshop	15	50
Lack of a forum to share professional experiences with peers	12	40
Lack of a forum to share information with peer's post workshop	13	43.3
Lack of a forum to ask peers questions post workshop	15	50
Limited access to professional information and knowledge	21	70

Source: Questionnaire

Table 3 infers that majority of the teachers 21 (70%) cited limited access to professional information and knowledge as one of the challenges that is faced with traditional repositories. This was followed by bulk handouts and printouts 18 (60%). 15 (50%) of the respondents noted that loss of data post workshop and a lack of a forum to ask peers questions post workshop was a challenge in

traditional repositories. This was followed by a lack of a forum to share information with peer's post workshop at 13 (43.3%). And 12 (40%) observed that lack of a forum to share professional experiences with peers was a challenge in traditional repositories.

When asked what other challenges the respondents face, the responses given ranged as follows: 'lack of teaching learning materials, loss of data, unreliable internet to browse and share with peers, short periods of training, lack of power and internet connectivity as well as computer illiteracy which makes it difficult to access and retrieve information online.'

Inferring from the above data, it is clear that majority of the respondents are youthful, and the respondents do receive post-workshop scaffolding albeit through the traditional repositories medium of whose challenge greatly limits access to professional information and knowledge.

Research objective two sought to find out the benefits of online repositories. The responses are as indicated in table 4. There was a total of 31 responses.

Table 4.   **Benefits of online repositories**

Benefits of online repositories	N	%
Exposure to current professional trends	27	87.1
Sharing experiences and knowledge with peers	25	80.6
Collaborative learning with peers	25	80.6
Professional support and opportunities	22	71.0
Diversified professional information	20	64.5

Source: Questionnaire

Majority of the respondents 27 (87.1%) showed that exposure to current professional trends as a crucial online repositories benefit. 25 (80.6%) of the respondents affirmed that both sharing experiences and knowledge with peers and collaborative learning with peers is a very significant benefit accrued from online repositories. This was followed by 22 (71%) who noted professional support and opportunities as a benefit that can be drawn from online repositories. 20 (64.5%) respondents agreed that diversified professional information can be accrued from online repositories.

The respondents further indicated that they would expect the following benefits from online repositories: 'availability of information online and offline, ability to use ICT in learning, meaningful professional socialization with colleagues from all over the country, acquisition of professional knowledge and information, being able to learn what's outside the box i.e. the world, enhanced digital literacy in both theory and practice, and the ability to access the internet anytime.'

These findings are in agreement with the findings of Mwangi and Khatete (2017) who found out that teachers need to interact with their peers to support each other professionally and that they do need to be given opportunities through ICT forums to create these professional networks.

Objective three sought to find out what factors have affected the adoption of online repositories in peer-based learning. The research yielded the following results. There were 32 respondents.

**Table 5.**   <u>**Factors affecting the adoption of online repositories**</u>

Factors affecting the adoption of online repositories	N	%
Lack of computers	20	62.5
Lack of reliable internet	24	75.0
Lack of reliable electricity	26	81.3
Lack of ICT training	26	81.3
Lack of an online forum to interact with peers	14	43.8
Non contextualised digital forums	15	46.9

     Source: Questionnaire

Table 5 indicates that lack of reliable electricity and lack of ICT training as the major hindrances to the adoption of online repositories which stood at both 26 (81.3%). Lack of reliable internet was also highly rated at 24 (75%) whilst lack of computers stood at 20 (62.5%). Respondents 15 (46.9%) agreed that non contextualized digital forums do hinder the adoption of online repositories. Lack of an online forum to interact with peers stood at 14 (43.8%).

Respondents also noted the following as hindrances to the adoption of online repositories: 'expensive internet bundles, lack of ICT knowledge and skills to keep pace with the technological advancements, regions in the county that lack mobile network coverage, lack of professional support from relevant personnel, low motivation.'

Table 6. Adoption of online repositories

Recommend KICD to adopt online repositories in CBC training workshops

No 12.5%

Yes 87.5%
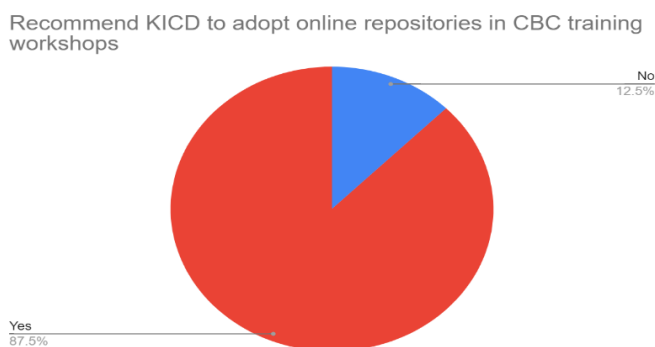
     Source: Questionnaire

Respondents were asked if they would recommend KICD to adopt online repositories in their CBC teacher training workshops and responded as indicated in table 6. There were 32 respondents.

The respondents highly recommended the adoption of online repositories in training workshops as seen in table 6 with 28 (87.5%) affirming the need and only 4 (12.5%) negating the need of adopting online repositories quoting 'lack of internet connectivity and lack of requisite ICT training in teachers to effectively adopt online repositories.'

Objective four sought to develop and validate an adoption framework for online management system in peer-based learning.

Independent variable (F)	Intervening variables (X)	Dependent variable (Y)

Outcome variable
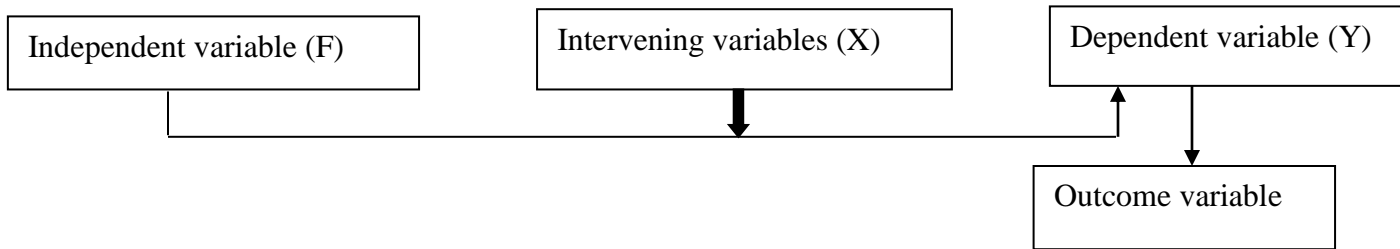
To achieve the objective four of this study the following function was used.

$Y = F_{1...6}(X_{1...6})$

Where:

Y is the dependent variable

F_1 = Cumbersome, F_2 = Bulk, F_3 = limit access to data, F_4 = lack/loss of data, F_5 = currency of information, F_6 = misinformation/disinformation

X_1 = Lack of sufficient ICT infrastructure, X_2 = Peer perceptions, X_3 = ICT sensitization, X_4 = Cost of ICT, X_5 = Time and effort, X_6 = ICT policy.

V.   CONCLUSION

The findings of the study established that peers are aware of information communication technology and its relevance in their everyday quest for information, knowledge and professional growth. Lack of and insufficient ICT infrastructure is the biggest hindrance to peers adopting online repositories.

Recommendation

The Kenya Institute of Curriculum Development is recommended to avail ICT infrastructure in the competency-based curriculum workshops. Teachers should be given ICT skills alongside the CBC trainings as this will enable post workshop professional support using contextualised digital forums which is highly needed by the teachers.

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