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Full Length Research Paper

Instructor and student experiences of e-learning at a Tanzanian University

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The establishment of e-learning in higher education institutions in Tanzania has so far led to disappointing learning outcomes. The strategy used by instructors to practice e-learning and their ways of working with technologies does not encourage active learning, which in turn hampers student learning outcomes. The purpose of this study was to explore students' and instructors' practices of e-learning in Tanzania higher education. The study examined the e-learning experiences of 8 instructors and 120 students at a major university. Data sources included questionnaires administered to the students; interviews with selected students, the instructors, and technicians who provided technical support; and observation of classroom activities and the online learning environment. All qualitative data were analysed through a coding strategy, and quantitative data were analysed using SPSS version 16. The results showed that e-learning designs and pedagogical strategies used prevented students from learning collaboratively. The instructors' experiences of and e-learning designs reflected informational baseline modes of e-learning course delivery. Similarly, the students' experiences and practices of e-learning were influenced by unreflective e-learning designs and pedagogical strategies resulting in low student involvement in learning. The conclusion is that e-learning designs were inadequate for students to achieve meaningful interactions and substantial learning outcomes.

Key words: E-learning, higher education, instructor experiences, student experiences, developing Countries.

INTRODUCTION

Advances in technology have created the need for people to become lifelong learners in a constantly changing society. These demands have led educational institutions around the world to exploit the benefits of technology by creating e-learning programmes to provide chances for learners to acquire novel education (Stepanyan, Littlejohn and Margaryan, 2013). For example, higher education institutions in developed countries have exploited e-learning affordances to provide students with superior learning outcomes. However, despite the potential of e-learning to promote learning, with respect to higher education in developing countries like Tanzania, it has not led to enhanced learning outcomes.

The term e-learning has been conceptualized differently by different scholars. Mayer (2003) defines e-learning as any type of learning that is facilitated by the Internet and other, new forms of information and communications technology (ICT). Laurillard (2006) defines e-learning as any teaching or learning that is supported and enhanced by the use of any form of digital technology. Moore, Dickson-Deane and Galyen (2011) conceptualize e-learning as all forms of electronically supported teaching and learning. This study refers to e-learning as teaching and learning that is supported by digital technologies, whereby the instructor and learners are not present at the same time, and learning materials are electronically delivered to learners through any device with Internet connectivity.

Studies concerning e-learning designs and student learning outcomes have been conducted widely in developed countries. Many of these studies reveal that students in e-learning environments may have similar or better learning experiences than those in traditional classes (David and Glore, 2010; Ladyshewsky, 2004; Al-

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Qahtani and Higgins, 2013). The key factor for such effective teaching in e-learning environments being the instructors clear understanding of the interplay between technology, pedagogy and subject matter being taught (Koehler and Mishra, 2008). Such teaching effectiveness enables students to acquire learning experience that is useful in a rapidly changing society (Lim, Zhao, Tondeur, Chai, and Tsai, 2013). In Africa, few studies have reported e-learning success stories. For example, Magagula and Ngwenya (2004) report that students in e-learning environments at the University of Swaziland had considerable learning experience and achieved better academic performance than those in traditional classes. However, most of the established e-learning programmes in higher education in developing countries like Tanzania have not led to expected learning experiences. For example, Chikasha, et al. (2007) report that e-learning had a weak effect on student learning achievement in Africa. Similarly, Ndume, Tilya and Twaakyondo (2008) report that student learning experience in e-learning classes in higher education in Africa was not promising. Nevertheless, little attention has been paid to exploring instructor and student experiences of e-learning, the nature of e-learning designs, and the extent to which e-learning designs produce student interactions and engagement in learning. Thus, this study focuses on these variables and the findings obtained acts as a stepping stone for moving forward the e-learning industry in Tanzania and other countries around the world with similar technological circumstances.

Theoretical background

Learning has traditionally been regarded as knowledge transmission from the instructor to learners (Reeves, 2000). Recently, learning theories and student learning process has been shifting from knowledge transmission and individual construction of knowledge (Ling, Yan and Man, 2005) towards social and collaborative learning (Bereiter, 2002; Caladine, 2008). In this context, learners become enculturated in communities of inquiry. According to Swan, Garrison and Richardson (2009), students learn better within the community of inquiry. The emergence of new educational technologies has made it possible for instructors to create and sustain learning communities using online discussions. Such learning environments provide opportunities for students to develop a social presence that fosters collaborative construction of meaning (Swan et al., 2009). The community of inquiry (learning) enables student to generate a repertoire of ideas and deeper thinking through sustained dialogue and critical questioning.

Higher education institutions have traditionally been considered as communities of scholars, and inquiry is crucial for students to explore and develop ideas deeper. In this basis, social constructivist approaches are essential to enabling students to learn from each other and develop deeper understanding of what they are learning. Thus, the instructor plays a crucial role in designing effective pedagogical strategies which creates a teaching presence (Anderson, 2008) which is essential for promoting student-student-instructor -student exchanges (Swan et al., 2009), and moderating learning experience (Anderson, 2008).

Moreover, instructor use of social learning tools out of functional fixedness (Koehler and Mishra, 2008), and effective pedagogical strategies helps student to generate multiple inquiry conversation threads during idea exploration. The acts of individuals exploring and exchanging ideas using social learning tools are grounded in cultural-historical activity theory (Miettinen, 2006). According to cultural-historical activity theory (CHAT), students are members of the learning community who may use discussion forums such as the Modular Object-Orientated Dynamic Learning Environment (Moodle) to explore and exchange ideas. These students work under certain rules, such as treating each other sympathetically and avoiding abusive language during the learning process. Within the learning community, there are various roles played by members (subjects) within the community of inquiry such as the instructor moderating the learning discourses that led student to achieving the intended goal(s) and learning outcomes. Thus, social constructivism and activity theories form a foundation for creating and sustaining online communities of inquiry.

Rationale for the Adoption of e-Learning in Higher Education in Tanzania

There are many reasons for adopting e-learning in Tanzania higher education. Some of the reasons include the need to increase access to higher education (Komba, 2009), and improve teaching and learning. It is also used to mitigate the problem of insufficient learning resources (Lujara, Kissaka, Trojer, & Mvungi, 2006). In Tanzania, higher education institutions are currently constrained by the increasing number of students who urgently need access to higher education, while study conditions are not keeping pace with such an increase. Given the physical distances, and insufficient infrastructure, having high-quality e-learning education systems may be very important in providing Tanzanian students with effective learning experiences.

Although e-learning programmes have been established in HE institutes in Tanzania, they have not led to enhanced learning (experience) outcomes (Ndume et al, 2008). This situation is surprising as some universities in developing countries, Africa in particular, despite experiencing similar challenges to universities in Tanzania, they have managed to facilitate student to achieve somewhat better performance in e-learning, com-

pared to students in traditional classes. For example, the Swaziland experience shows that online students perform similarly to on-campus students (Magagula and Ngwenya, 2004). These scholars argue that students in an e-learning setting may perform better than traditional students, provided that relevant educational supports are in place during their learning. More recently, Al-Qahtani and Higgins (2013) explored the effect of e-learning, blended learning and classrom learning on students' achievement at Umm Al-Qura University in Saudi Arabia. These reserachers found that students learning achievements in blended and in sole e-learning evironments was better compared to students in face-to-face teaching. Such a situation invites one to ask how other universities around the world with similar e-learning contexts manage to provide better student learning achievements.

In developing countries like Tanzania there has been little research that asked instructors and students about their experiences with e-learning, or considered how different e-learning designs and pedagogical strategies would improve student learning achievement. Thus, the purpose of this study was to explore current e-learning practices at a Tanzanian university with a view to uncovering the probable underlying factors that hinder the realisation of better student learning achievement. It attempted to answer two research questions:

- ✓ What is the nature of the e-learning designs created by Tanzania university instructors' in their existing practices?
- ✓ To what extent do the existing e-learning designs produce student interactions and engagement during learning?

The findings obtained from this study provide wider insights and baseline data that can be used as stepping stones for designing e-learning environments that would promote student interactivity, engagement, knowledge development and learning achievement.

METHODS

Research Context and Participants

This study was conducted at a Tanzanian university that was purposefully selected out of eight available public universities. The University has a well-developed technological infrastructure with a local area network connected to student residence halls and teaching areas, and every academic department had at least one computer laboratory (Mtebe, Dachi, & Raphael, 2011). In addition, the University offers recognized e-learning courses. The University at the time of conducting this research had 43 blended e-learning courses. Ten percent of the courses and participating students were selected for this study based on Fowler's (2009) suggestions that a sample may range from 1% to 10% of a population.

Random section without replacement was used to select the four courses to participate in this research. The four selected courses had a total enrolment of 1200 undergraduate students, of whom 120 were systematically selected from the four courses. There were 108 instructors teaching e-learning courses, but only 78 were willing to participate in this research. Of these, 8 were chosen, which allowed only 4 classroom observations. At the same time, two e-learning technical staff members were deliberately selected from the 16 members available based on their willingness to participate and the likelihood that they would provide useful information about the e-learning system applicability.

Data collection

Data collection protocols included questionnaire, interviews, and classroom and e-learning environments observations.

Questionnaire

A questionnaire was designed which focused on exploring students' experiences and e-learning practices. Before it was administered, it was evaluated by four experienced instructors and two e-learning experts, who did not participate in the study. After initial modification, the questionnaire was tested on 24 students to determine whether the questions were clear. It was found that some questions and a few scientific terms were not well understood, and the questions were reworded accordingly. The final version of the questionnaire was administered to the 120 participating students during class time. The students were asked to complete the questionnaires and to return them at the next lesson. All of the questionnaires were returned and were properly filled out to allow statistical analysis.

Interviews

The instructor interviews were intended to explore instructor experiences, pedagogical strategies, and e-learning designs. The instructors were asked to describe their familiarity with e-learning, how they designed e-learning environments, and what instructional and pedagogical strategies they used. Similarly, in their interviews, students were asked about their understanding of e-learning, the methods of interaction they used during learning and the types of instructional materials. Moreover, in-depth interviews with technical staff elicited data about the instructors' and students' e-learning deployment, and system workability. Each category of respondent had a different interview protocol

because each group had different aspects that were focused on. Respondents were not given the questions in advance in order to avoid pre-determined answers. The researchers established friendly relationships with the participants by interacting with them (socially), especially during tea meetings and other educational gathering, prior to the onset of interviews. Each interview lasted about 45 minutes and was audio recorded. The audio recordings were transcribed verbatim, and the transcriptions were given to the respective respondents for review and comments.

Observations

The researchers developed observation checklists for classroom and e-learning environments. The classroom observation was intended to determine how often the instructors introduced problems or cases for students to engage in, and the extent to which they encouraged students to work collaboratively. It also aimed to determine the ways in which instructors invited class discussions; presented student led activities, and solicited students' input. Other elements included instructor responses to students' ideas, and the various kinds of learning materials used. Due to the University's tight schedule, we managed to observe only four instructors, each for two separate one-hour classroom sessions. The lessons were not video or audio recorded as instructors were not willing to be recorded. In each case, the researchers noted the categories of events every time they occurred. The observation reports were presented to the participating instructors, and they were asked to expand on issues raised in the report. Similarly, observations of e-learning environments were intended to identify the instructional materials uploaded and the ways in which students used them. It also aimed to determine the student-student-instructor -student interaction patterns.

DATA ANALYSIS

Data gathered from the questionnaires were analysed using SPSS version 16.0. Descriptive statistics generated frequency distributions for students' experiences with e-learning, interactions and technological proficiency. Data gathered from classroom observations and e-learning environments were coded and organized into categories, and were then quantified and analysed descriptively. Data gathered through interviews were analysed using a coding process. The first author coded all interview transcripts and generated set of codes. He consistently improved the code description for more than three rounds and organized the codes into main and sub-codes.

To establish the reliability of the coding scheme, sub-code descriptions along with associated examples were given to the second author for member checking. Code ratings from the second author were compared with those of the first author. It was found that coders were in agreement on 26 sub-codes out of 33 sub-codes. The researchers resolved their discrepancies on the few sub-codes through negotiation. The second author refined the sub-codes based on the agreement reached. Then, all data were re-coded by the first author using the refined coding scheme.

Ethical issues

The authors declare that before commencing this research they obtained ethical approval from the Human Research Ethics Committee for Non-Clinical Faculties to conduct this study. During the process of conducting this research, participants were informed of their rights. For example, they were informed that their participation in this research was entirely voluntary, and that all information they provided would be kept secure and confidential. They were also free to review and erase the entire or parts of the audio-tape recordings if they deemed necessary. After they had been informed of their rights, participants signed consent forms before commencing any action. Their names were coded and anonymously stated using made-up names (pseudonyms) for ethical adherence. Furthermore, all audio recordings, questionnaires and field observation notes are stored in a secure location for later use subject to ethical review and approval.

RESULTS

The results of this research are presented within the framework of the two research questions stated in section 3.0. The analysis of interview transcripts generated 4 main codes, which included 'instructor practice', which encompassed instructor understanding of e-learning, e-learning designs and pedagogical strategies. The 'student practice' dimension involved how students' understood and practiced e-learning. The 'Ways of ICT use' dimension entailed the practices and use of technological tools. The 'social interactivity' dimension involved possibilities for social interactions. The next two sections present the results based on instructor perspectives.

Instructor practices of e-learning

Through interviews, instructors were asked to describe the e-learning platform features they were familiar with and report which ones they used most often. The aim was to explore instructor experience with elements of e-learning environments. Most of the instructors expressed

Table 1. *Instructor methodological strategies used in classroom transaction.*

	Instructor use of a particular methods (N=4)					
Category	A	B	C	D	Total	%
Problem based teaching	x	x	x	x	0	0
Case based teaching	x	x	x	x	0	0
Collaborative learning method	x	✓	x	✓	2	50
Discussion teaching method	✓	x	✓	x	2	50
Activity method	x	x	x	x	0	0
Lecture teaching method	✓	✓	✓	✓	4	100

Note: A – D = Instructor observed; [✓] = method used; [x] = method not used.

similar ideas about e-learning. Their responses demonstrated a considerable knowledge of e-learning elements. Since the instructors had similar views, we selected one excerpt which conveys the views of instructors. For example, Instructor B noted:

Moodle is the e-learning platform we are using at this university. It has a lot of features that support activities like discussion forums, sending emails to students, making announcements and uploading course materials like PowerPoint and notes. It also supports audio and video materials, chats, and simulations.

In this excerpt it seems the instructor was describing the capability of the Moodle e-learning platform to support various instructional materials and provide chances for effective communications and social interactions. Instructor B's mention of various elements suggests that the instructors had some understanding of e-learning. Although the instructors described a variety of e-learning features, it was crucial to determine how the features were used. Thus, the instructors were asked to indicate the elements they used most often and why. The question was intended to explore their practical experience of e-learning and the ways in which they used ICT tools. Responses to this question showed that most of the instructors often used PowerPoint, course material delivery and e-mail tools. For example, Instructor C **noted:**

In most cases, I use course delivery item to present learning materials. Then, I notify my students using emails, asking them to visit the platform where they will find materials and learn comfortably. It is easy to use course delivery item to upload teaching notes or PowerPoint slides because it does not take much of my time.

Instructor C was primarily describing the management issues of e-learning. His description focused mostly on the mode of delivery of learning materials. The perceived ease of use of some e-learning tools determined the ways ICT was used. The instructional materials used were more or less informational baseline course materials. Instructor C thought narrowly that students would learn comfortably if they found learning materials posted to the e-learning environments. It seems that Instructor C had little technical know-how to embrace social learning tools for designing stimulating learning environments that would lead to meaningful learning. While Instructor C took a stance on using simple e-learning tools, Instructor D went further, explaining the ways in which ICT was used:

I'm aware that using various e-learning tools may stimulate students learning. But, some of the items like discussion forum require extra time, which most of us don't have due to a huge workload, thus using the item occasionally. Items like simulations, wikis and audio/video, I don't bother myself because they are complex to prepare and even to practice.

From this excerpt, it seems that Instructor D understood the potential of using multiple e-learning resources to facilitate student learning and expressed a modest technological proficiency in the management of e-learning and the use of complex technologies. Instructor D highlighted some crucial elements such as knowledge and use of e-learning tools, knowledge for designing e-learning settings, and pedagogical knowledge for teaching in an e-learning context. The perceived complexity of some technological tools suggested a little understanding of how to use the tools. As such, the instructors utilized elementary tools, which limited student collaborative learning. It seems that the instructors' familiarity with e-learning elements had not translated into practical use of these elements. Although these findings are common (e.g. Christie and Jurado, 2009; Mahdizadeh et al., 2008), they provide evidence suggesting that one should pursue the practices of e-learning in new directions.

Correspondingly, we observed four instructors while teaching in classroom setting. A total of 8 lessons, 2 from each instructor were observed. The basic picture of the classroom teaching and learning activities was sufficient for the purpose of the study. The aspects observed were classified into three major categories: the method, the contents and social interactions. Results in Table 1 shows that the four observed instructors mostly used the traditional lecture.

Table 2. *Instructional materials used in classroom teaching.*

Category	Instructional materials used (N=4) A	B	C	D	Total	%
Text materials, eg. PPT	✓	✓	✓	✓		100
Videos	x	x	x	x	0	0
Audios	x	x	x	x	0	0
Animations	✓	x	x	x	1	25
Pictures/images	x	x	✓	x	1	25
Other instructional materials	x	x	x	x	0	0

Note: A – D = Instructor observed; [✓] = instructional materials used; [x] = instructional materials not used.

Table 3. *Instructor–student interaction in the classroom.*

Category	Interaction patterns (N=4) A	B	C	D	Total	%
Instructor solicitation of students' inputs	✓	x	✓	x	2	50
Instructor responses (feedback) to students conception	✓	✓	x	✓	3	75
Instructor involving students' to exchange ideas	x	x	✓	x	1	25

Note: A – D = Instructor observed; [✓] = element used; [x] = element not used

Method of Teaching.

Collaborative learning and discussion methods were rarely used and not deliberately planned, and resulted in low student involvement. The instructors did not use problem and case based teaching approaches to situate purposeful learning in classroom transaction. They did not involve students in any activity or allow them to explore ideas deeply.

Classroom observation also determined the kinds of instructional materials used. Table 2 shows that the four observed instructors used extensive PowerPoint presentations. The instructors read the slides line by line very fast, with few stops to clarify certain concepts, and seldom flipped back to previous slides where students had not been able to take notes clearly.

One instructor sometimes added images to his PowerPoint presentation. Similarly, another instructor sometimes used animation in a separate file to explain some concept he was teaching. The researchers determined the interaction patterns between students and with their instructors. Although the instructors interacted with students, as shown in Table 3, the interaction was elementary. For example, Instructor A involved students at the beginning of the lesson to brainstorm with them the main points of the previous lesson. Similarly, Instructor B and D interacted with students based on queries students raised about having missed noting some words from the slides that were taken off quickly during presentation.

Conversely, the discussion between Instructor C and students was based on arranging the venue for the next lesson, which was rather off-task. While the instructors were expected to use teaching methods that would promote deep students learning experiences, surprisingly, they relied on the lecture teaching method. Some approaches to teaching like collaborative learning and discussion methods were haphazardly used, and other approaches were less considered.

Similarly, observation of the e-learning environments showed that the extensive reading notes and presentation slides that the instructors primarily made available were usually ones that mirrored the textbook. Where the instructors designed online discussion forums, they failed to keep the discussion running. The pedagogical strategies used in both classroom and e-learning environments were literally based on an instructivist approach to teaching, which involves knowledge transmission.

Design of E-Learning Environments and Pedagogical Strategies

The researchers were interested in knowing how the instructors designed the e-learning environments and the pedagogical strategies they used. We asked them to elaborate whether they had attended any training programmes concerning e-learning. All eight interviewed instructors had attended training programmes designed to equip them with skills for designing learning environments and pedagogical strategies. For example, some of them claimed to have designed leaning environments with a range of learning materials:

We were taken through the process of preparing online tests, and were told to include everything we teach in traditional classes for online students. Facilitators just

Table 4. *Students' familiarity with selected e-learning environments elements.*

	Feature	Likert five points scale response (%)				
		Strongly disagree	Disagree	Moderate	Agree	Strongly agree
1	Reading announcements	2	6	2	37	53
2	Accessing course materials	3	4	14	15	64
3	Assignments	7	1	15	47	30
4	Graded quizzes	16	5	4	26	49
5	Web resources	11	9	10	30	40
6	Audio resources	15	7	10	26	42
7	Discussion forum	21	10	15	17	37
8	Video resources	28	7	10	23	32
9	Wikis or Blogs	31	29	18	13	9

mentioned items like videos/audio, animations, they said will be covered later. As you ask me to explain materials I gave to students, I may say that the knowledge I have allows me to prepare PowerPoint and lecture notes, not otherwise (Instructor H).

In this excerpt, the instructor was explaining the nature of the professional development they had received. It seems that the manner in which the instructors were trained in designing e-learning environments was based on traditional approaches to teaching. The instructors were advised to upload lecture notes and PowerPoint presentations, which suggests linear rather than interactive learning environments. Instructors need to design e-learning environments that encourage student interaction (Caladine, 2008), and collaborative learning (Chan and vanAalst, 2008). In order to elucidate the responses obtained from the instructors, we interviewed two technicians who supported the e-learning courses. They were asked to describe what educational materials instructors normally uploaded to the e-learning environments and why. Their responses showed that most instructors used non-interactive learning materials that did not encourage student interaction and collaboration:

As I trace the e-learning environments, I see most of the materials uploaded are in the form of text, mainly PowerPoint and lecture notes, but there is NO video, or materials that challenge students to think. The reason, I think, is their rigidity to embrace new change (Technician 1).

It is not common for instructors' to use sound and visual materials. I think it's because of low Internet speed. The bandwidth here is 12.5 mbps downlink and 1.5 mbps uplink, which is not bad for e-learning practices. My worry is when instructors use videos, the most it may bring problems for students residing in rural areas where Internet connectivity is poor (Technician 2).

Technician 1 perceived that the nature of e-learning designs and instructional materials used did not promote students critical thinking. Technician 1 suggested that the reluctance of the instructors to learn and embrace new educational technologies was the main reason for using non-interactive instructional materials. This comment suggests that the technological barrier may have led instructors to shy away from trying it, thus relying on knowledge transmission strategies. While Technician 1 focused on the technological barrier, Technician 2 was concerned with Internet reliability. Although the university needed to improve the strength of the Internet, the available bandwidth was ideal for designing engaging e-learning environments. It seems that Technician 2 had little idea whether video/audio clips or discussion forums may even be used with a modem and in lower bandwidth setting.

Generally, the instructors' design of the e-learning environments and their pedagogical strategies focused on knowledge transmission. Such an approach to teaching does not seem to help students to explore ideas and develop deeper understanding. Instructors need to consider designing e-learning environments in such a way as to allow social construction of knowledge. The uses of social leaning tools such as discussion forums, podcasts, and blogs among others are likely to engage students in social interactivity and meaning learning. The preceding sections presented results from the instructors' perspective; the next two sections present results on the students' perspectives.

Students' Understanding of E-learning

In order to grasp the students' familiarity with e-learning, we asked them through a questionnaire using a five-point scale (1: Strongly disagree; 5: Strongly agree) to indicate features they thought were vital for the effective practice of e-learning. Table 4 shows that the 120 students who completed the survey had a high level of awareness of e-learning features. A few were moderately aware of chats, wikis and discussion forums.

Although the majority of students seemed to be aware of various e-learning items, it was interesting to know whether they used them. Thus, students were asked to

Table 5. *Descriptive statistics of students' use of selected e-learning features.*

Item	Students' response (%)					
	Used daily	Used 2 to 3 times a week	Weekly	Every two weeks	Monthly	Never used
Read Announcement	4	6	56	20	10	4
Accessing course materials	2	7	7	64	9	11
Usage of assignments	1	9	13	20	53	5
Use of graded quizzes	7	17	17	14	33	12
Access to web-resources	3	18	31	21	11	16
Use of audio materials	1	1	4	6	6	82
Use of Discussion Forums	6	3	5	9	12	65
Use of Video materials	5	7	8	1	2	76
Usage of Wikis & Blogs	0	0	2	1	5	92

indicate how often they had used those features in the e-learning courses they attended. The aim was to determine the students' e-learning practices behaviour. Table 5 shows that despite the students' awareness of e-learning functions, their practical use of those features was not evident.

For example, most of the interactive items such as wikis, blogs, discussion forums and videos were very little used. To elucidate the questionnaire results, students were asked through interviews how they managed learning in e-learning environments. The question aimed to characterize the students' practices of e-learning. There were some variations in students' answers to the question. For example, Student 1 focused more on the nature of educational materials:

You may need to get more leaning materials such as simulations, video games, blogging or even wikis that can makes us more active, but you find little text materials or nothing may be available. I don't think this is what e-learning is all about, and you know we depend on the tutor, especially in this new system of learning.

In this excerpt, it seems that Student 1 was explaining the need to have social learning tools for collaborative learning. In Student 1's opinion, the instructors had not provided interactive and engaging learning materials; instead, they underused e-learning by overusing the presentation materials that displaced students' active and reflective learning. It seems that Student 1 was not happy with what was made available in the e-learning environment. These views about the practices of e-learning were congruent with those of Student 2, who noted that:

The way the courses are structured, I doubt whether I'm getting enough to learn, because, the materials we get are like those in traditional lectures. We always use little that we find out there. You know, it is the tutor who prepares the lesson, and we students just use what has been prepared. It would be better if the instructor provides materials that allow us to utilize e-learning fully.

It seems that Student 2 was making connections between the way the e-learning course was structured and what was provided in the e-learning environment. Her views suggest that the way the e-learning environment was designed limited students' opportunities to access and practice e-learning meaningfully. She knew that effective learning depended on the instructor's design and pedagogical strategies. As such, Student 2 believed that the instructors traditionally prepared a few non-interactive learning materials, which were not enough to offer substantial learning outcomes. In contrast, the responses from other students seem to focus on the experiences of the instructors and students. For example, Students 4 noted:

To my understanding, managing learning, especially in e-learning, depends on ones experience in working with technology. I think tutors are supposed to have experience for preparing learning materials while students; we need to have experience in using those materials and various technological tools.

This excerpt seems to focus more on practical experience with e-learning.

The views revealed that the manner in which students practiced e-learning was associated with their experiences. These views place the instructors and students in a continuum in which the instructors need to have experiences in designing vibrant learning environments, whereas students' needs experiences to exploit the resources.

In order to triangulate the interview results, we asked students through a questionnaire using a five point scale (1: Strongly disagree; 5: Strongly agree) to indicate what their experiences were in selected aspects of e-learning courses. Table 6 shows the responses of students to the question. Although students seemed to have a clear understanding of learning contents, they found that e-learning did not support their learning and that they had little e-learning competence. Similarly, the data showed that the students perceived that the structure and the way

Table 6. *Descriptive statistics of student response to items of e-learning environment.*

	Aspect	Likert five points scale response (%)				
		Strongly disagree	Disagree	Moderate	Agree	Strongly agree
1	Learning materials are easy to understand	2	8	2	36	52
2	Learning resources supports my learning	29	19	23	11	18
3	Competent working with e-learning tools	33	35	14	6	12
4	E-learning courses are motivating	56	21	5	6	12
5	Learning contents are exciting	57	20	5	7	11
6	High interactions among students and instructors	59	18	6	7	10
7	Have enough ability to managing online learning	55	23	15	5	2
8	E-learning helped me learn actively	62	24	4	3	7

Table 7. *Descriptive statistics (percentages) of interactivity patterns .*

	Feature	Students' response rates (%)				
		Very rarely	Rarely	Moderate	Often	Very often
1	Student-instructor interaction during discussion forum	47	13	16	11	13
2	Student-instructor interaction via online chatting	53	31	6	10	0
3	Student-students interaction via discussion forum	56	27	9	7	1
4	Instructors-student feedback	65	19	7	8	1
5	Student-instructor feedback	83	9	8	0	0

learning contents were organized did not motivate them to learn.

Students experienced limited online interaction between themselves and with their instructors. Similarly, e-learning was not supporting students' active learning. It was interesting to see that students reported sufficient ability to work with e-learning tools, but very weak ability to manage their online learning. This situation makes one wonder what students understand about e-learning. In order to obtain a clear insight into such situation, we asked students through in-depth interviews to articulate their understanding of e-learning.

Students' Interactivity in E-Learning Settings

Interaction and communication are important components of e-learning; they enable students to undertake collaborative and reflective learning. It was thus essential to obtain insights into the interactions between students with different e-learning activities. On a form, students were asked to rank to what extent they participated in the indicated e-learning activities on a scale of 1 to 5 (1: Very rarely; 5: Very often). The results are presented in Table 7, which shows that most of the students had experienced relatively little interaction. This situation makes one wonder how students could achieve meaningful learning if there is limited interactions and collaborative learning.

The interaction patterns can be associated with the way the e-learning settings were designed and how the instructors' pedagogical strategies were aligned with learning activities. The linear nature of learning materials provided does not seem to provide opportunities for student interactivity. This learning experience indicates that students had insignificant learning interaction, which limited their collaborative learning.

DISCUSSION

This study has two main findings. One, the instructors' e-learning strategies and the way they used technology reflected an informational baseline mode of e-learning course delivery. Two, students had superficial experiences with e-learning and e-learning designs, which hindered them from learning collaboratively.

Despite their familiarity with e-learning features, the instructors used few of them. The regularity of instructors' use of e-learning tools depended on their understanding of a particular tool and their ability to use the technology. It seems that the professional development offered to the instructors was inadequate to equip them with the necessary technological and pedagogical skills. As such,

most of the time, instructors used course content tools to design non-interactive learning environments (Christie and Jurado, 2009). The predominant use of non-interactive pedagogical strategies and the design of unreflective learning environments imply a low level practice of e-learning on the part of instructors. This situation may be associated with the ways in which technology was understood among instructors and the mismatch between technological and pedagogical content knowledge (Koehler and Mishra, 2008).

The design and practices of e-learning require a thorough understanding of the affordances e-learning offers. Although technologies provide pedagogical affordances (Kirschner, Strijbos, Kreijns, and Beers, 2004), the majority of instructors mostly used lecture notes and PowerPoint slides. Even though these technologies have static attributes (Parette Jr et al., 2011), they can be used in pedagogically exciting ways. For example, the instructors can use PowerPoint at higher levels to create attractive and conceptualized learning. Yu and Smith (2008) argue that PowerPoint tool has the capability to support complex computer graphics, photos, videos and audio recordings that capture students' attention. It can also provide hyperlinks to interactive websites, digitized articles, and animations. Such uses of PowerPoint go beyond information delivery and act as gateways for reaching a wide range of activities and educational materials. Nevertheless, the instructors used e-learning platforms as repositories of course content (Weaver, Spratt, & Nair, 2008), without considering how students could learn and develop deeper understanding. Such e-learning designs and pedagogical enactment are grounded in instructivist theory (Bates, 2012; Rodriguez, 2013), and have some value especially when low level cognitive processing skills need to be learned. Its flaw is that it is difficult to promote social interactivity, creativity, and critical thinking using instructivist pedagogy (Bates, 2012). These results were consistent with the findings of Mahdizadeh et al (2008) and Christie and Jurado (2009), who found limited use of interactive learning resources, and that learning focused mostly on knowledge transmission. Designs of that nature had little impact on student interaction and meaningful learning. In situations like Tanzania, where a competent workforce is greatly needed for the socio-economic development of the nation, having this kind of e-learning design will only produce graduates with insufficient knowledge and skills to address the new demands posed by society. Based on constructivism and activity theories, the use of enhanced discussion, wikis, blogs and podcasts (Richardson, 2006) may provide deeper and conceptualized learning. The instructors need to consider designing e-learning environments aimed at social and collaborative learning, rather than relying on non-interactive strategies.

The results also showed no evidence of the practical use of e-learning tools by students notwithstanding the students' familiarity with e-learning features. These results were contrary to Weaver et al's. (2008) findings that showed a lack of awareness of the features in the WebCT platform among students. However, in the present study, despite their awareness, students had not used the existing e-learning tools effectively. This means that familiarity with e-learning features does not guarantee the use of those e-learning tools. The findings suggest that the students may not have been well-oriented towards e-learning especially on the use of social learning tools such as the effective use of discussion forums which allow students to actively explore ideas, ask fellows productive questions, criticise each other and comment on the ideas of others. In so doing, students may extend learning beyond mere interaction to deeper learning. Nevertheless, the student experiences showed that the way the e-learning courses were planned had hindered them from participating fully in learning. These findings were congruent to Lee (2012) results who found that students were not actively criticizing the ideas of others. The kind of learning materials, little time spared by instructors for e-learning, and lack of learning activities were some of factors hindering student involvement.

While students' success in e-learning can be associated with how well instructors prepare engaging learning activities (Mayer, 2003), this was not the case at this university. Instead, the instructors overused learning materials, which distracted students' from learning actively. As, such the e-learning designs did not seem to support students collaborative knowledge building as purported by constructivists. If the instructors design e-learning environments grounded in social constructivism they are likely to engage students in collaborative knowledge construction (Chan and van Aalst 2008). As Liu et al. (2012) argue an increase in social interaction and student content engagement definitely enhanced their academic performance.

While interaction and collaboration are encouraged among students to achieve better learning (Kirschner et al, 2004), the structure and linear nature of e-learning materials in the present study denied students the opportunity to engage in collaborative learning. The instructors' scarce feedback and the lack of student-student-instructor-student exchanges hindered the social construction of knowledge and meaningful learning. Although it was interesting to see that instructors at a Tanzanian university had been trained in pedagogical and technical aspects of e-learning (Mtebe et al, 2011), the design of the e-learning environments mostly provided baseline course information, which does not promote students deeper knowledge (gain) development. Findings from this research enable one to gain a theoretical and pedagogical understanding of e-learning designs used (McKenny and Reeves, 2012), not only in the study area but also for countries having similar context. On the other hand, these results invite one to

think how e-learning can be designed to have a positive impact on student learning achievement. This question signals further development of e-learning environments and underlying pedagogical strategies.

CONCLUSION

This study examined the existing e-learning practices at one university in Tanzania. The findings show that the instructors' understanding of e-learning was reflected in the way in which they designed and practiced e-learning. Similarly, the students' experiences of e-learning were influenced by instructor designs and pedagogical strategies.

The implication was that instructors' e-learning designs and the pedagogical strategies they used were at low-level and reflected informational baseline modes of e-learning course delivery. As such, the student experiences and practices of e-learning were influenced by pedagogical designs resulting in little interaction and involvement in learning. This situation invites more research to examine ways in which e-learning could be designed to promote students' interactivity and cognitive benefits. To reach that end, further research is needed on the educational design of learning environments that move away from an instructivist e-learning model and embrace social constructivism theory. Such an undertaking will reveal relevant designs and pedagogical practices for universities in countries with similar environments and technological circumstances to universities in Tanzania.

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