Online Social Network as a Tool for Facilitating e-Learning in Tanzania

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Abstract—The main delivery system in Tanzanian education has been face-to-face approach relying on printed educational materials. High cost of books and insufficient teaching materials are still the major challenges. Recently, Online Social Networks (OSN) have gained popularity across the world and they are used for sharing information, news, chatting, messaging, and keeping in touch with friends. Studies have shown that OSNs can be used as tools for facilitating learning, supplementing face-to-face approach. Currently, there is an increase in the number of local OSN sites and subscribers in Tanzania. This paper examines to what extent are local OSNs in Tanzania exploited as e-learning platforms. Moreover, it addresses the student's perceived challenges and discusses the opportunities of using local OSNs towards fostering students' academic development.

Keywords—**E-learning, Jamii Forums, Online Social Networks, Teaching and Learning.**

I. INTRODUCTION

Tanzanian education system has undergone important stages of improvements for the past 20 years. Face-to-face learning approach has been used for years as the fundamental approach of education delivery [1].

In recent years, e-learning system has emerged as another approach of education delivery. E-learning can be defined as the design, development and delivery of instructional materials by electronic devices, such as computers, mobile phones, CDs and DVDs [2].

Online Social Network (OSN) refers to communities of people who connect with each other online. Lately, OSNs have gained wide acceptance worldwide. Millions of people are now using OSNs across the globe. OSNs present a platform with huge prospect where schools, colleges, universities and other educational institutions communicate with each other. There is a general mood among researchers to investigate and determine how OSNs can formally be used as teaching platforms [3].

There exist a number of studies that show that OSNs are now being used by students for both social and academic purposes [4 - 7]. Meanwhile, other studies have shown that students mostly tend to use OSNs for social connections [8-10].

Recently in Tanzania Local Online Social Networks (LOSNs) have been developed. We define LOSNs as the types of online social networks that are being managed and used much by Tanzanians and the language of communication used is either Swahili (which is the Tanzanian national language) or English or both. LOSNs have gained popularity and are used for various purposes. While the popularity of LOSNs as information sharing platforms is significantly observed, the extent to which they facilitate the learning process remains unclear. This paper is therefore intended to fill this knowledge gap by analyzing how and to what extent LOSNs are being used as a tool for facilitating e-learning in Tanzania, along with their challenges and opportunities, taking JamiiForums (JF) as a study case [11].

Specifically the study aims at answering the following questions:

i. Do LOSNs offer digital learning materials for students? If yes, are they relevant to Tanzanian educational system?
ii. What categories of educational materials are more prevalent to LOSNs?
iii. To what extent are LOSNs exploited as e-learning platforms?

The rest of the paper is organized as follows: Section 2 provides an overview of Tanzanian education system. Section 3 describes related works. Section 4 discusses the status of the Internet and OSNs usage in Tanzania. Study methodology is described in Section 5. Section 6 presents the results and discussion. Challenges and opportunities of using LOSNs as facilitation tools in e-learning are discussed in section 7 and 8 respectively while section 9 provides conclusion and recommendations.

II. OVERVIEW OF TANZANIAN EDUCATION SYSTEM

The 2012 Population and Housing Census results show that, Tanzania has a population of 44,928,923 of which 43,625,354 is on Tanzania Mainland and 1,303,569 is in Tanzania Zanzibar, and occupies 945,087 km2. 43.5% of the population is between 0-14 years, 53.7% between 15-64 years and 2.8% above 65 years of age. The literacy level for the total population is 69.4%.

Education in Tanzania follows a 2-7-4-2-3 system as shown in figure 1. Pre-primary education in Tanzania takes 2 years and it is not compulsory. Primary education is free and compulsory for all children aged 7 to 13 [12]. Though primary education is free, there are other costs which

parents need to incur for their children such as school uniforms, books, transportation, etc. [13].

Secondary education is divided in two phases namely: Ordinary level secondary education (O-level) and Advanced level (A-level) secondary education. O-level takes four years of study, from form 1 to form 4, while A-level takes 2 years of study in form 5 and form 6. After A-level education, a student (according to his/her performance in national exam) can join university for bachelor degree (which normally takes 3 to 4 years of study) or colleges for certificate and diploma courses. Furthermore, a student can pursue master's and doctoral degree after completing bachelor and master's degree respectively.
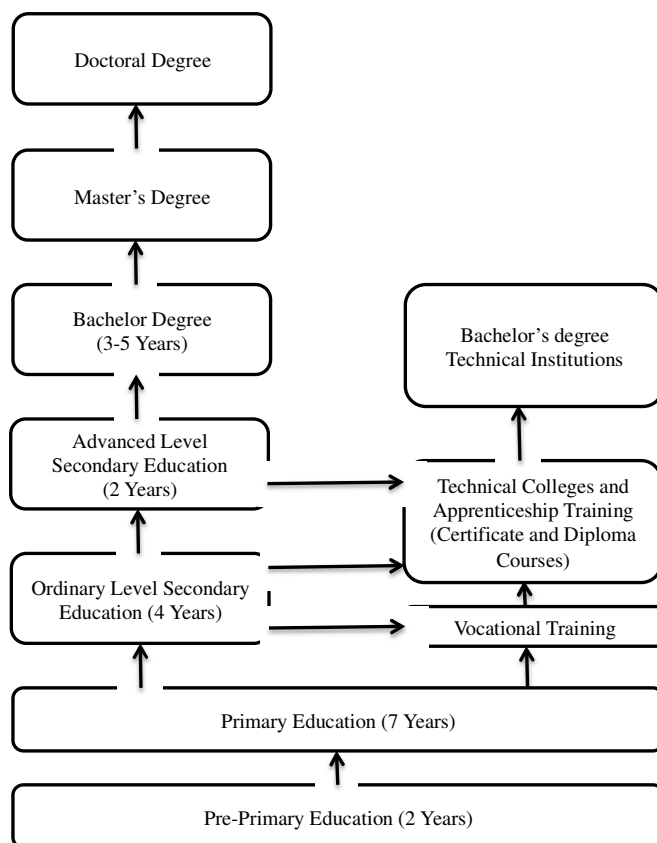

Figure 1: Education System in Tanzania

According to Swarts and Wachira [14] the major challenges facing Tanzanian education system are:

i. Overcrowded classrooms.
ii. High ratio of students to teaching and learning materials.
iii. Poor quality of teaching and learning especially in the science subjects.
iv. Inability of teachers to teach some topics in the new curriculum especially after it was reviewed.
v. Shortage of science teachers as most of those trained migrates professionally to other non-teaching professions.
vi. In-service training not well coordinated.
vii. Science laboratories not enough hampering quality in the teaching of science subjects
viii. High attrition rates of trained ICT tutors who move on to greener pastures

ix. Unreliable power supply.
x. Lack of digital content that is relevant to the Tanzanian context and aligned to the curriculum.

Tanzania Vision 2025 [15], which is the national development strategy requires the nation to meet the following development goals in next 10 years: achieving quality and good life for all, good governance, and the rule of law and building a strong and resilient economy that can effectively withstand global competition. In this vision, education has been recognized as strategic change agent for transformation of the country into knowledge-based economy. In order to meet the targeted plan, the vision 2025 recognizes ICT particularly e-learning as a tool that will help to address challenges of education. Further, the National ICT Policy of 2003 [16] emphasizes the need of using ICT for enhancing education services and advocates the use of e-learning system in Tanzania education system. Studies and policies indicate that ICT can be used as a tool for improving education delivery, outcomes and impact among students.

E-learning uses ICTs to enhance and support teaching and learning processes. It is the instructional content or learning experiences delivered or enabled by electronic technologies and it incorporates a wide variety of learning strategies and technologies. E-learning ranges from the way students use e-mail and access course work online while following a course on campus to programmes offered entirely online [17, 18]. It is thus an alternative solution, which enlarges accessibility to training compared to face-to-face. E-learning includes a wide variety of learning strategies and ICT applications for exchanging information and gaining knowledge. Such ICT applications include television and radio; Compact Discs (CDs) and Digital Versatile Discs (DVDs); video conferencing; mobile technologies; web-based technologies; and electronic learning platforms.

III. RELATED WORKS

The study by [19] explored the usage of OSN by secondary school students in Mauritius and how OSNs can be explored to enhance learning among students. The study found that most students are already using OSNs for learning. Moreover, the study found out that OSNs act as platforms for communication and collaboration in school related projects or assignments.

The work by Battrawi [20] highlighted the impact and the role of social networks in promoting science literacy and interest in science using the Facebook page 'Creative Minds' as a case study. The study suggests that social networks might create a virtual space for informal learning of science where students and the general public may learn valuable scientific knowledge, interact with each other on science-related topics and share the science knowledge.

Pilli [21] posits that the features offered by OSNs make them more attractive and superior to users over Learning Management Systems (LMSs). Furthermore, educators are heading towards using OSNs in learning process in order to create an easier and more efficient leaning environments for students.

Alona [22] examined the use of Online Social

Networking sites (OSNs) by higher-education institutes in Israel by identifying activity patterns, content patterns, and interactivity. The study shows that the use and content patterns of OSNs are similar to that offered in Israel higher education system in physical life. However, the study observed that the potential of OSNs in higher education has not been utilized to the fullest.

Willems [23] studied the potentials and pitfalls of incorporating OSNs within higher education. The study found that while there are numerous potentials of using OSNs in learning, also there are many pitfalls that need consideration and evaluation before its adoption. The study highlighted several benefits that OSNs provide including: An alternative LMS over the traditional learning system, a social community for geographically dispersed cohort, an opportunity for peer teaching, and a resource sharing opportunity. Moreover, the study includes the following as pitfalls of using OSNs as e-learning tools: privacy issues; theft and impersonations; taking things out of the particular context that they were meant and misuse of information, stalking, cyber-bullying, virtual integrity and issues relating to intellectual property and copyright. Ajjan [24] reports that at the times when OSNs is used for educational purposes it motivates students' communications and interests in the subjects concerned.

IV. INTERNET AND ONLINE SOCIAL NETWORKS IN TANZANIA

For the past decade, there has been an increase in the number of Internet users in Tanzania. However, the number is not large enough compared with developed countries or other African countries like South Africa and Egypt. Up to 31st December 2013, Tanzania was sixth in Africa to have a large number of Internet users [26]. Table 1 shows the distribution of Internet users and OSN users (Facebook) in Africa and Tanzania in 2013.

OSNs in Tanzania can be grouped into two main categories, International Online Social Networks (IOSNs) and Local Online Social Networks (LOSNs). Currently there exist several LOSNs in Tanzania such as JamiiForums, Wavuti, Mwanakijiji, Mpekuzihuru, Wanabidii and IssaMichuzi.

The most common IOSNs in Tanzania includes Facebook, Twitter, Instagram, Google+ and Linkedin which are used for information exchange, news, entertainment, sharing of photos and multimedia contents and gossiping. By December 31, 2013, the country had about 5,629,532 (12%) Internet users, 705,460 (1.5%) Facebook users and 228,714 (0.51%) are Linkedin users [26].

This study is based on JamiiForums (JF). JF was chosen because it is the most popular LOSN in Tanzania with a page rank of to 5/10. Page rank is a Google's metric that lies between the values 0 to 10 to determine importance, reliability and authority of a web page.

Table 1: Internet Users, Population Statistics and Facebook Users in Africa/Tanzanian (Source: Miniwatts Marketing Group, 2013)

	Africa	Tanzania
Population (2011 Est.)	1,037,524,058	42,746,620
Internet Users (Dec. 2000)	4,514,400	115,000
Internet Users (Dec. 2011)	139,875,242	4,932,535
Penetration (% Population)	13.5%	11.5%
Users % Africa	100%	3.5%
Facebook (March 2012)	40,205,580	437,040

A. Overview of JF

JF is "User Generated Content" site whereby anyone can register and comment or start a new topic. Started in 2006, JF currently has more than 180,000 registered users, 492,140 topics, 8,636,567 posts and more than 158,000 page views everyday. Presently, it is the most popular LOSN in Tanzania. JF comprises of 15 main forums which include education, politics, technology, law, international, language and business, relationships and international forums.

In JF, a registered member can start a topic in any of the available forums, and members can discuss the topic by replying. A non-registered member can only view the post but cannot comment or reply on it. Each forum in JF is moderated by a number of moderators who have the tasks of overseeing the communication activities in the forums, monitoring the interchange of contributors and making decisions regarding content and the direction of threads.

V. STUDY METHODOLOGY

The study employed a case study design approach whereby JF was taken as a study case. The study analyzed JF's education forum that is used for posting and discussing educational matters.

We employed content analysis method [27] to analyze how JF is used as an e-learning platform in Tanzania. Content analysis is the scientific study of the content with reference to the meanings, contexts and intentions contained in messages [28]. Content analysis may be seen as a method where the content of the message forms the basis for drawing inferences and conclusions about the content [29]. The goal of content analysis is to translate documented "raw" phenomena into data that can be treated in a scientific method so that a body of knowledge may be constructed. Content analysis lies on four methodological issues: selection of units of analysis, developing categories, sampling appropriate content, and checking reliability of coding [30].

We analyzed a total of 500 top posts in the JF's education sub-forum that has many replies. From a total of 500 top educational posts, we developed categories according to their nature. The following categories were obtained: Educational advice, educational material, educational news, educational discussion/debate, educational advocacy and miscellaneous (for posts which do not fall on available categories).

Educational advice is the supportive guidance or suggestions offered with respect to the particular action. For example, in JF's education sub-forum, a member can post

asking for advice on whether he/she should join university A or university B for a certain course. Educational materials refer to all materials that can be used by members for education purposes. This includes lecture notes, books, past exams, journal papers etc. Educational discussion/debate refers to a formal discussion on educational matter in a forum. For example, a member can post a discussion topic "*What factors led to 2012 form four massive failure?*" Members discuss the topic and contribute by replying in the thread. Educational news refers to information about recent events or happenings concerning education. For example, "*list of selected students to join the university A for undergraduate studies 2014-2015*". Educational advocacy is the act or process of supporting a cause or proposal that concerns education.

In order to understand to what extent are LOSNs exploited as e-learning platforms questionnaire method was used. We employed purposively sampling technique whereby a sample of 70 students in the University of Dodoma. The criterion used for selecting a respondent was that the respondent must have used JF for at least 6 months. The age of the respondents is 22 ± 4 (median: 20 years of age) with more male respondents (63 % male vs. 37 % female) than female.

Table 2: Frequency distribution for gender

Gender	Frequency	Percent (%)
Female	26	37
Male	44	63
Total	70	100

Considering students experience (1st year – 4th year) the majority, 37% of students are at their first year, 26% at their second year, 20% at their third year and 17% at their fourth year.

Table 3: Frequency distribution for year of study

Gender	Frequency	Percent (%)
First Year	26	37
Second Year	18	26
Third Year	14	20
Fourth Year	12	17
Total	70	100

The Likert Scale [31] was used to rate students' perception towards the use of JF and its exploitation as e-learning platform. The scale ranged from 1 (strongly disagree), 2 (disagree), 3 (agree), to 4 (strongly agree). The students were required to mark each statement in reference to the rating scale.

Cronbach's Alpha formula for the internal consistency of the instruments [32] was used to determine the reliability of student's questionnaire. In Cronbach's Alpha formula, the calculated value ranges between 0 and 1 whereby the value that is close to 1 has stronger reliability and the value that is close to 0 has weak reliability. Thus:

$$\alpha = \frac{k}{k-1}\left(1 - \frac{\sum_{i=1}^{k}\sigma_{Y_i}^2}{\sigma_X^2}\right) \qquad (1)$$

Where: k is the number of items, σ_X^2 is the variance of the observed total test scores and $\sum_{i=1}^{k}\sigma_{Y_i}^2$ is the sum of item variance. The results returned 0.81 as the coefficient reliability for students' questionnaire. 0.81 value was considered high enough to judge the questionnaire as reliable.

VI. RESULTS AND DISCUSSION

Table 4 tabulated the percentage distribution of JF posts in education sub-forum according to their categories by using content analysis.

Table 4: Percentage distribution of the Top 500 JF's categories

Categories	Percentage (%)
Educational Advice	11.3
Educational Material	2.6
Educational News	54
Discussion/Debate	21.6
Educational Advocacy	6.6
Miscellaneous/Others	4
Total	100

Figure 2 shows the distribution of JF's posts in education sub-forum according to their categories by using content analysis. From table 4 and figure 2, the distribution of 500 top posts in the JF's education sub-forum is shown. We observe that posts in JF's educational forum are mainly educational news (54%), followed by discussions (21.6%), educational advice (11.3%), advocacy (6.6%), educational material (2.6%) and miscellaneous (4%). The study findings show that, JF is mainly used for posting news compared to educational discussion and exchange of educational materials.
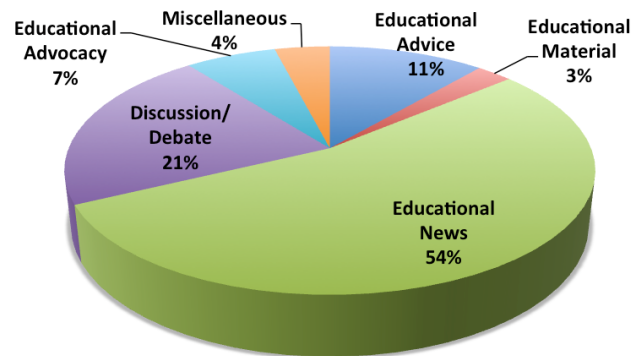

Figure 2: Distribution of 500 top JF's education sub-forum posts according to their nature.

Meanwhile, JF is also being used for educational debate (21.6%). Users in the education forum post a topic that relates to education on which other users debates on it. Example of such posts can be *"which university is the best to join for engineering courses?"* Other posts are related to educational advice. Example, a student may post asking advice on what course he/she should choose before joining the university or the difference between course A and B (e.g. the difference between computer science and computer engineering degree programmes).

The study found that the forum is not categorized according to Tanzanian educational system (2-7-4-2-3). Moreover, the study found that there is a little presence of shared educational materials (example books, lecture notes and journal papers) in the education forum. For example, the study didn't find any educational material that relates to nursery or primary education in the forum. This could be because much of education materials are not yet digitized to meet our learning needs.

The study further explores the perception of students on the usage using LOSNs as e-learning platforms. Response of the students is given in Table 5.

Table 5. Average ratings of student's perception of using LOSNs as e-learning platform. (1=Strongly disagree, 2=Disagree, 3 =Agree 4=Strongly agree)

Item	Mean(μ)	S (σ)	Mode
1	3.0	0.55	3
2	3.0	0.77	3
3	3.4	0.56	3
4	2.6	0.84	2
5	2.7	0.72	2

[1] I think LOSNs can be used in my course.
[2] I think LOSNs can improve communication between students and instructors.
[3] I think LOSNs can improve communication among students in a course.
[4] I think using LOSNs would be a distraction in learning.
[5] I do NOT want to use LOSNs in any of my course.

Questions concerning the uses of LOSNs as e-learning platforms were measured on a 4-point Likert scale. Most respondents believed that LOSNs would be valuable if they become integrated in their courses (μ=3.0, σ=0.55), and could precisely increase communication among students in their respective courses (μ=3.40, σ= 0.56) and between students and instructors (μ =3.0, σ=0.77). Moreover, respondents did not have strong agreement that the use of LOSNs in a course would be a distraction (μ =2.62, σ = 0.84).

Generally, the open-ended questions exposed that most respondents were in favor of the possible use of LOSNs such as JF as e-learning platform. The study found that, to some extent, students are aware of the benefits of using LOSNs as e-learning platform. They believe that by using LOSNs, they can personalize their educational environment.

VII. CHALLENGES

In this section first we present and discuss students' perception on challenges that hinder LOSNs to be used as e-learning platform in Tanzania as shown in Table 6.

Table 6: Student's perception on challenges that hinder the usage of LOSNs as e-learning platform in Tanzania

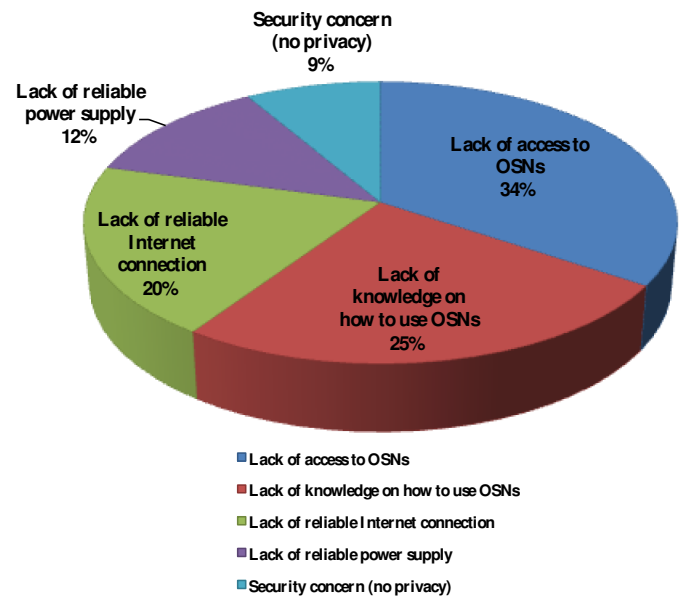| Challenge	Percentage
Lack of access to OSNs	34.4
Lack of knowledge on how to use OSNs	25.1
Lack of reliable Internet connection	19.7
Lack of reliable power supply	12.3
Threat to Personal Privacy	8.5
Total	100

Figure 3: Distribution of student's perceived challenges that hinder the use of LOSNs as e-learning platform in Tanzania.

A. Lack of access to OSNs

Lack of access to OSNs was the leading cause that hinders the use of LOSNs as e-learning platform in Tanzania as it was evidenced by 34% of the total responses. In order to access OSNs, a user must have a device with Internet access (phone with Internet, laptop or pc) to connect with the forum. Due to the existence of high poverty among majority of Tanzanians these devices are owned only by limited number of people. Most teachers and students therefore still cannot afford buy a PC or phone with Internet capabilities. Even for those who have devices that can access OSNs, higher Internet subscription cost is still a challenge.

B. Lack of knowledge on how to use OSNs

Lack of knowledge on how to use OSNs is reported to be another barrier towards the use of LOSNs as e-learning platform in Tanzania. 25.1% of the total responses pointed out this challenge. For example, the study found that most students and teachers still don't know how to use Online Social Networks and how these OSNs can assist them in academic development. Lack of computer literacy is still a major problem. However, with the increase of ICT sensitization programs in schools and as portable computing devices such as smartphones and laptops become cheaper, this problem will be solved with time.

C. Lack of reliable Internet connection

As reported by 20% of the total respondents, lack of reliable Internet connection in Tanzania is another challenge. Currently in Tanzania, most mobile network operators provide Internet services. However, network coverage of the mobile operators is still a challenge. Some parts of Tanzania have no mobile network connection at all.

This affects the use of OSNs.

D. Lack of reliable power supply

In response to the reasons that hamper the usage of LOSN as an e-learning platform lack of reliable electric power supply in Tanzania is another challenge. This contributed 12% of the total responses. So far not all parts of Tanzania have been connected to national electrical grid. The availability of electrical energy among Tanzania households is 21% of which 80% being located in urban area [33]. Almost all primary and secondary schools in rural area have no electricity. This limits schools' ability to use computers, assess online materials. It also limits students to get light energy for studying. Therefore access to electronic learning materials is still difficult in many areas of the country.

E. Threat to Personal Privacy and Information Security

With the growth of cybercrime and identity theft, students perceived that, privacy and information security risks are re still hindering the usage of LOSNs as e-learning platform. This contributed to 8.5% of the total responses. Some of the main worries for students include: To what extent is the information posted about student secured? Who has access to that information posted on LOSNs and what's his role? (Instructor, student, parent, webmaster), How is it ensured that an individual recognizes his right to privacy and exercises it appropriately?

VIII. OPPORTUNITIES

Apart from challenges, Local Online Social Networks (LOSNs) presents the following opportunities in education sector:

A. Increase students' academic collaboration

With the increase in LOSNs, there is a chance of more students to be registering in these LOSNs. Students will have opportunity to collaborate locally and globally without the limitation of geographical boundary. They can create study groups according to courses and educational level. For example, in JF education forum A-level student may create one group for students who take Physics, Chemistry, and Biology (PCB) and another group for students take History, Kiswahili and Language (HKL). Using these study groups, students can start a discussion about a certain topic, and other students can contribute through replies. Moreover, they can solve various questions, assignments and share study materials when away from school.

B. Increase teacher's collaboration

LOSNs present an opportunity for teachers and lecturers to discuss their academic activities, organize research teams and discuss research ideas, share their academic experience and materials. Teacher can create groups according to subjects or courses they teach. These groups provide teachers with a chance to share experience and knowledge they have. For example, secondary school teachers may create a group for Mathematics whereby some of challenging mathematics topic such as Probability and Calculus can be discussed.

Currently, due to shortage of fund, teacher's participation in trainings such as short courses and seminars is low. In order to provide quality education teachers require upgrading their skills as teaching technologies as well as environments changes very fast. Availability of LOSNs that provides teacher's collaboration will help minimize this problem.

C. Increase communication without boundaries

LOSNs have the opportunity to establish nationwide network of Teachers Resource Centers (TRCs) to promote research in education. By using LOSNs such as JF students and teachers with different origin, backgrounds, cultures and gender can communicate with each other and share knowledge.

D. Creates a new way of interaction in learning process

By using LOSNs, a dynamic avenue of interaction between students themselves and students and teachers is presented. Students can ask teachers questions online and other students can participate in the discussion by using various platforms (smartphone, PC or laptop) at anytime.

E. Increase access to educational materials

Through LOSNs, teachers and lectures can posts different study materials, electronic books and assignments for students to download and read. When an assignment is posted in a LOSN, students can discuss it and provide comments without geographical boundaries and having to meet face to face. The use of LOSNs will therefore provide schools and training institutions with adequate and appropriate instruction materials; and thus reduces the shortage of textbooks. The availability of online materials will therefore help motivate the students' participation in academic activities.

IX. CONCLUSIONS AND RECOMMENDATIONS

In this paper, we have explored the use of OSNs as a tool for facilitating e-learning in Tanzanian context. Study findings show that LOSNs are not fully utilized as e-learning tool. LOSNs are being used mainly for providing educational news compared to other educational aspects such as provision of study materials and educational advice. The materials posted in LOSNs such JF are not structured according to Tanzanian educational system. Some of the perceived challenges that hinder the usage of LOSNs as e-learning tools include lack of access to LOSNs, unreliable power supply, threat to privacy and information security, lack of reliable internet connection and lack of knowledge on how to use LOSNs.

The study recommends that the government in collaboration with other stakeholders should improve the country's infrastructure that will foster the fully utilization of LOSNs. LOSNs education forums should be organized in such they can provide education support according to Tanzania education systems. LOSNs administrators are advised to create sufficient number of education sub-forums that provide users with opportunities to post, share and discuss different topics among each other.

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