https://dx.doi.org/10.22161/ijaers.6.1.24 *ISSN: 2349-6495(P) | 2456-1908(O)*

Investigating Web 2.0 Tools Use and Students Cognitive Engagement in Selected Tanzanian Higher Institutions: Preparing Towards 21st Learning

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***Abstract*—** *With the availability and affordability of computers and communication technology devices worldwide, teaching no longer centers around teachers. Students become autonomous learners, taking the ownership of learning where they no longer rely fully on teachers as the learning resources. This paves innovative intervention towards engaging the learners cognitively using Web 2.0 tools. Web 2.0 tools offer learners to engage in higher order thinking skills involving not just to understand and apply but also to analyze, evaluate and create through two-way communications and collaborations. Due to the pedagogical potentials of Web 2.0 tools, this study attempts to investigate how the students involve Web 2.0 tools in supporting classroom learning. This study employed a questionnaire survey among students at a Higher Learning Institution involving 100 samples. This is a preliminary study prior to the final study involving bigger populations from different universities. Interviews were also carried out among three students to gain in-depth understanding of learning that enables the researcher to derive a conceptual model. The related main ideas from each interviewee were gathered to get commonality of themes. And finally, main themes were generated. A systematic data analysis was done based on developing themes in an inductive way as directed by the content of data. The findings reveal that the majority of students use Web 2.0 tools for finding resources, communication and for both low and higher order thinking skills. Further findings show that Academic readiness contributed significantly on students cognitive engagement while Use of Web 2.0 tools did not contribute significantly. Implications of the study address the theoretical and practical aspects.*

Keywords*— *Web 2.0, cognitive engagement, 21st Century, higher learning institutions.

I. INTRODUCTION

Web 2.0 tools are defined as those digital tools that enable accessing and producing knowledge in ways that move beyond passive consumption to active construction **(**Beach, Hull & O'Brien, 2011). There are different types of Web 2.0 tools such as (i) social network sites which include Facebook, Twitter, WhatsApp. These are online tools that enhance collaboration, information sharing, communication and interaction of learners and lecturers in teaching and learning activities. (ii) Media sharing which include Moovely, Youtube, Google plus (+), Vimeo, Prezi (iii) Blogging like Blogspot.com, Wordpress, Website editor, Mozello.com, Wix.com, Weebly.com, Moovly (iv) Online library like ProQuest, Google scholar (v) Content management such as learning management system (LMS) which includes Moodle and Blackboard. Table 1.0 reveals the types and applications of Web 2.0 tools.

Table.1.0: Web 2.0 Tools and their functions in teaching and learning

Types of Tools	**Examples**	**Applications**
Social network sites	Facebook, Twitter, WhatsApp, MySpace	Enhances learner to interact with peers and lecturers. Enhance knowledge sharing, creative production, development of ideas and making reflection
Media sharing	Moovely, Youtube, Google plus (+), Vimeo,	Facilitate sharing videos, photos

https://dx.doi.org/10.22161/ijaers.6.1.24 *ISSN: 2349-6495(P) | 2456-1908(O)*

	Prezi, Flickr, Google drive, Wikipedia, Wikis	
Blogging	Blogspot.com, Wordpress, Website editor, Mozello.com, Wix.com, Weebly.com, Moovly	enables online-users to make regular postings to the Web, e.g., a personal diary or an analysis of current events
Online Databases	ProQuest, Scopus, Taylor & Francis, Science Direct, Google scholar	Helps to retrieve online resources for research and teaching and learning purposes.
Content management	Learning management system(LMS) which includes Moodle, Blackboard.	Facilitate to create, share, augment, tag, and upload content.
Wikis	Wikipedia,	assist users to post and edit one another's content/work. Enable users to make collaborative writing and can be used as a repository for the storage and retrieval of professional knowledge
Bookmarking	Delicious.com, tagging, folksonomies	enhance users to add, annotate, edit, and share bookmarks of web documents

Web 2.0 tools affordances are aligned with the technological pedagogical content knowledge (TPACK) model of Koehler and Mishra (2009). The model offers potential guidance for instructors to utilize when employing technology in teaching and learning. Thus, when these tools are properly integrated into instructional methods based on this model, they are assumed to foster collaborative and social skills among students in higher learning institutions.

To prepare learners for career readiness, lecturers can utilize Web 2.0 tools as they stimulate a dynamic discussion among the learners, enhance interaction and communication among learners to learners, learners to instructors, instructors to instructors as well as with parents (McLaughlin and Lee, 2007; Duffy, 2008; McLaughlin and Lee, 2008; Light and Polin, 2010). Web 2.0 tools are imperative for 21st century learners who need a variety of social skills to make them meet the requirements of a dynamic job market, place them to attain brilliant learning achievements and enhance them to serve the community (Newland and Byles, 2014; World Economic Forum, 2015).

ICT devices are now ubiquitous everywhere in Tanzania and affordable. ICT can raise the quality of education through supplement of traditional and modern pedagogical methods like inquiry and project-based and experimental learning techniques. As such, these technologies can be exceptionally utilized to enhancestudents' cognitive engagement. It will enhance the underprivileged students to access learning materials that will enable them to develop higher order thinking skills. As such, these skills will enhance them qualify for prospect jobs(Elzarka, 2012). Nowadays, employers claim that lack of skills among graduates is related to outdated curriculum in higher learning institutions(Williams, 2015). Thus, as the needs of the employers focus on the 21st century skills, the students' learning should change as well. This, requires higher learning institutions to redesign their curriculum in order to produce employable graduates.

Studentshave opportunities to use the readily available Web 2.0 tools to access online resources for academic purposes. Social learning, collaborative tools, interactivity and innovation are terms entangled to describe Web 2.0 tools or Web-based learning. As we are approaching to the year 2021 which is the blue print of Tanzania five year plan development, there is a need to know the extent and how higher learning institutions assist the government to reach its development plan. Additionally, as higher learning institutions increasing across the country, it is difficult to know whether or not Web 2.0 tools are employed in learning by the students to foster the 21st century skills among them. Thus, this study is aimed to establish the extent students integrate Web 2.0 tools in learning.

II. STATEMENT OF THE PROBLEM

Student cognitive engagement is among the most important phenomenon in the 21st century learning strategies that accelerate the skills needed in the job market (Robles, 2012). Williams (2015) studied the perceptions of students and employers on the employability skills. Findings show that both students and employers believe that the 21st century skills such as higher-order thinking, problem solving, critical thinking, communication, collaborative and social skills are among the key determinants for employment among prospective graduates.

https://dx.doi.org/10.22161/ijaers.6.1.24 *ISSN: 2349-6495(P) | 2456-1908(O)*

Many studies on the twenty-first century skills have been suggesting and recommending to reshape the curriculum to enable learners acquire the demanding skills (Walser, 2008; Trilling &Fadel, 2009; National Institute of Education, Singapore, 2009; Kereluik, Mishra, Fahnoe& Terry, 2013; Brown &Duguid, 2017).

Student cognitive engagement might be enabled by using Web 2.0 tools in learning. Nevertheless, the studies of how best to integrate the Web 2. 0 tools in learning to foster student cognitive engagement in Tanzania are minimal.So, the present study attempts to fill this gap. This present study will investigate the integration of Web 2.0 tools among students to foster their cognitive engagement.

Purpose of the Study and Research Questions

This study was carried out with the purposes of investigating the extent learners integrate the Web 2.0 tools in learningand to examine the influence of using Web 2.0 tools on the student cognitive engagement in learning. More specifically, the questions driving the current study were:

1. To what extent do students use Web 2.0 tools in learning?
2. How do students perceive their readiness in adopting 21st century learning activities?
3. Are there possible effects of Web 2.0 tools on the students' engagement in learning?

III. LITERATURE REVIEW

Usage of Web 2.0 Tools in Learning

Web 2.0 tools are defined as those digital tools that enable accessing and producing knowledge in ways that move beyond passive consumption to active construction (Beach, Hull & O'Brien, 2011).Uzunboylu, Bicen and Cavus (2011) conducted a case study on integrating Web 2.0 tools into education. The study also sought students' opinions on positive impacts of Web 2.0 tools in learning. findings of the study reveal that most students were excited by using Web 2.0 tools in learning.Salehe (2008) investigated the use of Web 2.0 tools for facilitating collaboration in higher education.. The study aimed at evaluating the usefulness of Web 2.0 tools in learning as perceived by learners of higher learning institutions. The study employed a questionnaire survey to collect data. The study shows that learners recognized and were aware about the benefits of Web 2.0 tools such as Wikis, Blogs and Podcasting as paramount tools in teaching and learning. Additionally, the findings reveal that some learners were lacking knowledge on how to utilize some Web 2.0 tools that are useful in learning.

Crook, Harrison, Farrington-Flint, Tomás and Underwood (2010) studied Web 2.0 technologies in and outside learning environment. The study aimed at investigating the use and impact of Web 2.0 technologies in teaching and learning. The study employed a mixed methods. A questionnaire survey and interviews were used to generate data. The findings show that students use Web 2.0 technologies in both in and outside classroom. The findings also show that Web 2.0 technologies motivate and engage students in teaching and learning activities. Furthermore, Web 2.0 technologies were found to establish a participatory, collaborative and creative attitude of inquiry among both students and lecturers. A study by Dell(2012) found that Web 2.0 tools enable student cognitive engagement if these technologies are used meaningfully, students communicate with their fellow students, learners become content creators and usage of diversity of learning experiences.

Web 2.0 tools are pedagogical affordances.McLoughlin and Lee (2007) define Web 2.0 affordances as an activity that one can possibly do in a particular setting with a given tool to accomplish a certain task. For instance, utilizing blogs to write a text, edit it and post it. In other words, Web 2.0 affordances means the assistance that can be enhanced using its applications to make learning take place smoothly.

Web 2.0 tools enhance two-ways interaction (between lecturers and students) and stimulate learner's participation through diversity of images, text, audio and video. For example Wikipedia allows users to generate their ideas and enables users to refer for definitions and details of objects and events. Using Wiki for instance, students can create a glossary to define a concept from their own words (Tynan& Barnes, 2012). Similarly, using Popplet for mind mapping, students can brainstorm views both asynchronously and synchronously. Similarly, using Popplet for mind mapping, students can brainstorm views both asynchronously and synchronously.Web 2.0 tools enhance collaborative learning**.**Collaborative learning is the students' ability to learn or complete a given project/task together (Gerlach, 1994 &Laal&Laal, 2012).. As such, both students and lecturers become co-content creators or co-authors.

Student Cognitive Engagement

Student cognitive engagement refers to the extent to which students are willing and able to take on the learning task at hand (Rotgans& Schmidt, 2011). Manwaring (2017) defines student cognitive engagement as an approach that extremely engages student in learning intrinsically (self-regulation).

https://dx.doi.org/10.22161/ijaers.6.1.24 *ISSN: 2349-6495(P) | 2456-1908(O)*

Student cognitive engagement enables students to interact with the content of the lesson in a deep and thoughtful manner. It is through student cognitive engagement process that learning can take place. This makes students who are the recipients of instruction to receive the information which is efficient and on target.

Student cognitive engagement is very crucial in learning environment. Solis (2008) contends that student cognitive engagement is a prerequisite of student learning. So, in order for learning to take place in conducive environments that accommodate the entire students, cognitive engagement is crucial. Student cognitive engagement enhances learning to be truly meaningful to the students. Solis (2008) listed the following potential benefits of student cognitive engagement: students feel being included and fairly treated; students demonstrate their ability when they are involved in successful tasks; students can make their choices and learner autonomy; students become more active in discovering, constructing ideas and creating content; students become busy; students listen, observe, notice and become mindful in learning; students can say, do, write and respond openly and after class, students look satisfied.

IV. METHODS

Research Design

This study employed a mixed method design using sequential explanatory approach. As such, the study relied mostly on quantitative approach as its major source of collecting data followed by qualitative method as to offer further explanations of quantitative data results.

PARTICIPANTS

This study consisted of a Higher Learning Institution in Tanzania involving (N=100) samples.**Data Collection Procedures**

The researchers used questionnaire survey and interview protocol among the Higher Learning Institution involving 100 samplesto collect data.The researchersadministered the distribution of the questionnaires and collected them back after a half an hour. The researchersalso used purposive sampling technique to identify three informants for the interview sessions. The researchers used hand phone (HP) and MP3 to record the interviews. The researchers were focusing on interview questions. However, they were flexible to allow the continuation of the interview and gain the feedback. The researchers were probing where necessary for tracing more information pertaining Research Question 2.

Data Analysis Procedures

Statistical Program for Social Sciences (SPSS) wasutilized to analyze the data. The demographic information of the respondents are provided through percentage and frequency. Descriptive statistics using mean scores and percentage wereemployed to address Research Questions 1. In addressing research question 3, Multiple Regression Analysis (MRA) were employed. The researchers also used thematic analysis of interviews for the qualitative findings.

V. RESULTS

Quantitative Demographic Information

The quantitative demographic data collected comprise gender, age, year of study, ICT knowledge's level and subject that integrated ICT most. The data from the questionnaires were statistically analyzed using SPSS version 20.The demographic information are shown in Table 1.

Table.1: Respondents' Demographic Information

		Frequency (n)	Percentage (%)
Gender	Male	24	24
	Female	76	76
Age	19-23	70	70
	24-28	26	26
	29 and above	4	4
Year of study	1st year	94	94
	2nd year	5	5
	3rd year	1	1
ICT knowledge	Beginner	39	39
	Intermediate	56	56
	Advanced	5	5
Subject integrating technology most	ICT related courses	1	1
	Non ICT courses	99	99

Note: Total respondents are 100.

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ICT-related courses in this study are referred to as courses that offer skills of functions of information and communication technologies such as retrieving, assessing, storing, producing, presenting and exchanging information by communicating and participating in collaborative networks via the Internet. **The non ICT-related courses** are related to courses that do not offer ICT skills which include social sciences like History, Political Sciences, Psychology, Linguistics etc.(Herman, 1999 &Lemeke, 2002).

Qualitative Demographic Information

Purposive sampling technique was utilized to identify 3 informants for the interview sessions in qualitative approach of this study from the selected higher learning institutions in Tanzania comprising a male and two females. See Table 1.1

Table.1.1: Informants Demographic Information

Informants	Gender	Year of Study	Age	ICT Skills	Course	Discipline
1	M	2nd	19-24	Advance	Electrical Engineering	Pure Science
2	F	2nd	19-24	Intermediate	Geography& History	Social Sciences
3	F	2nd	19-24	Intermediate	Geography& History	

WEB 2.0 TOOLS USAGE

This section presents the findings of Research Question 1 of this study. The responses to the items I to 11 which were about the usage of Web 2.0 tools among HLIs' students in learning were rated " agree and strongly agree" signifying a score above 50%. The findings show the highest agreement of 94% with item 4 (I use Social networks (e.g. Facebook, Twitter) to extend and share ideas with my friends).This item was followed by item 9 (I refer to resources from websites for research or writing assignments) constituted the agreement of 93%. Item 10 (I use email to send my documents/assignments to my lecturers/friends) has scored 89% of "agree and strongly agree).This indicates that in general, many students use Web 2.0 tools in learning.

With the reference to items 1(I give feedback in my friend's blog) with 64% of agreement, item 2 (I am able to work together with my colleagues to accomplish assignments through Google Docs or Google Drive) with 87% of agreement, item 3 (I am able to share educational video with my classmates via YouTube or Google plus (+), with 75% of agreement, item 5 (I use Learning management system (LMS) e.g. Moodle or Blackboard, to create, share or upload content) with 66% of agreement, item 6 (I use blogs to share reflective or academic writing) with 60% of agreement, item 8(I upload self-developed video hosting sites such as YouTube/Vimeo/Wix.com/other Websites) with 52%, item 11 (I collaborate with friends to design graphics using online apps (e.g.canvas)) with 53%, the findings signify that the majority of the students use Web 2.0 tools in higher order thinking. The findings are also in parallel with the definition of Lcloughlin and Lee (2008) on the usage of Web 2.0 tools in learning.

However, the items 4, 9 and 10 suggest that students also use Web 2.0 tools i.e. Facebook, Twitter, email and online resources in lower thinking activities. When prompted with the interview questions on how the students use Web 2.0 tools in learning, they responded with the key themes that include giving feedback, work together, share videos, share online learning resources, using blogs or websites and network use learning. (See Table 1.2).

Table.1.2: Mean, Standard deviation and Percentage of Agreement

	Mean	Std. Deviation	Strongly agree%	Agree %	I'm not sure%	Disagree%	Strongly disagree%
1) I give feedback in my friend's blog	3.89	1.24	19.3	44.7	12.0	13.4	10.5
2) I am able to work together with my colleagues to accomplish assignments through Google Docs or Google Drive.	4.20	.92	42.8	43.8	5.4	6.6	1.5
3) I am able to share educational video with my classmates via YouTube or Google plus (+).	3.89	1.05	30.8	44.5	9.5	12.0	2.2

https://dx.doi.org/10.22161/ijaers.6.1.24 *ISSN: 2349-6495(P) | 2456-1908(O)*

4) I use Social networks (e.g. Facebook, Twitter) to extend and share ideas with my friends	4.49	.72	58.2	36.2	2.7	2.2	.7
5) I use Learning management system (LMS) e.g. Moodle or Blackboard, to create, share or upload content.	3.67	1.14	24.9	40.8	16.4	12.5	5.4
6) I use blogs to share reflective or academic writing.	3.41	1.26	19.3	40.8	11.0	19.6	9.3
7) I create a website for the course/subject using Wix.com/Google sites/ online free Website templates	2.83	1.28	11.2	24.4	16.6	31.1	16.6
8) I upload self-developed video hosting sites such as YouTube/Vimeo/Wix.com/other Websites.	3.23	1.31	17.8	34.2	12.7	23.2	12.0
9) I refer to resources from websites for research or writing assignments	4.39	.84	53.1	39.6	2.9	2.0	2.4
10) I use email to send my documents/assignments to my lecturers/friends.	4.30	.93	50.9	37.9	4.2	4.6	2.4
11) I collaborate with friends to design graphics using online apps (e.g.canvas)	3.33	1.29	21.0	32.0	15.2	22.2	9.5

N=100

STUDENTS'S READINESS

To answer the Research Question 2, interviews data were used. All 3 informants were asked about their readiness in using Web 2.0 tools in learning activities. All informants replied that they have been integrating Web 2.0 tools in diverse learning activities. Moreover, the study found key words that include giving feedback, collaboration, video sharing, sharing online content learning resources, sharing ideas**,** and academic /reflective writing, All these learning activities are parallel with Research Question 1..

Giving feedback

Feedback is referred to as providing information in a manner that motivates the receiver to agree with it, reflect on it, produce improved learning, and adjust for the better learning outcomes (Hattie, 2011). In referring to the quantitative findings, students use email to send documents and assignments to their lecturers with 93% of agreement. In addition, when respondents were probed with the question: "how do you use Web 2.0 tools in learning"? they replied indicating email as a platform for feedback, awarding marks and communication. Students send their works to lecturers, then the lecturers give feedback to their students through email.

> Sometimes you can email the lecturers and they can also give you feedback through the same email. (I3, DU 94, 96).
>
> After communicating with our professors or with our teachers,by sending our works through email, we will receive the feedbackthat they have received our work. After that the teachers are sending our feedback through email.They also, send our marks through email. They give feedback at the same time. When you contact them immediately they reply.There is good communication with our lecturers. (I2, DU 116, I1, DU 91, 93, 95, 97, 99, 101, 103, 105, 113, 115).

Out of three informants, two agreed that email was used as online feedback. The other one did not use email to get feedback through online from the lecturers. Instead, he usesWhatsApp and text messages. However, it is not their culture to call their lecturers either through WhatsApp call or phone.

Collaboration

Collaborative learning is referred to as students work together to accomplish a given task through Web 2.0 tools such as Google docs. With the availability of technology affordances, collaborative learning allows students to engage in inquiry, discuss critically, reflect by creating knowledge, explore means to innovate, solve problems (Harasim, 2012). In the quantitative findings, students show that they work together with their friends to accomplish assignments through Google Docs or Google Drive with 86.6% of agreement. The qualitative findings show also students use social networks i.e. WhatsApp, Facebook, Twitter and Instagram for collaboration in learning

https://dx.doi.org/10.22161/ijaers.6.1.24 *ISSN: 2349-6495(P) | 2456-1908(O)*

activities. They discuss assignments, projects and question given to them by their lecturers:

> If I want to show fellow students, about what I have done. I always use WhatsApp call(video), to show him or her how about my project running generally.(I1, DU 53).
>
> Sometimes, we collaborate(discuss) while sitting separately and in different places. For instance, while chatting with WhatsApp, Facebook,Instagram. (I3, DU 74, 76, 80, 82).
>
> We are collaborating(discussing) with others using these tools. (I2, DU 63, 65).

However, the term 'collaboration' from students' perspective, does not correspond with its definition, which is working together to accomplish a given task. The word collaboration rather, here means discussion. In general, it can be concluded that most students use Web 2.0 tools in discussing different issues which are related to their courses.

Video sharing

Video sharing is defined as a process of knowledge sharing through Web 2.0 tools by uploading educational videos on You tube and blogs to facilitate learning process. Through this process, knowledge is shared between students and lecturers, students and experts, and between students and students. The potential of educational videos includes increasing student engagement, offering flexible learning, enabling remote learning opportunities, simplifying thinking and problem solving, assisting with mastering learning (Bijnens, Vanbuel, Verstegen& Young, 2006). With regard to quantitative findings, students share educational video with their classmates through YouTube or Google plus (+), with 75.3% of agreement. Qualitative findings reveal sharing educational video via Youtube:

> I always use.. use YouTube.So, I can share with my friends (I1, DU 40, 42).
>
> I almost use YouTube to find different videos. YouTube, I do use it.Yeah! (I2, DU 32, 98, 100).
>
> we use that for sharing materials during university exams, during assignments from the lectures, we try to share using some blogs. Some students write and use some blogs. Some students have their own blogs. So they can write materials and put in blogs. So you access to these blogs you find the answers for that. So you compare and you find the answer for that. So, students try to make a blog and create a blog and put some materials which will be better. (I3, DU 18, 28).
>
> There are some students from another colleges or another universities… we still share these through online groups.Yeah! And sometimes, even.. even when we are together. (I2, DU 66, 68).
>
> Yeah! And also I have got a link which used usually in YouTube. After making our own projects, we always try to.. to put it there on our link so that.. after that we supply to other students so that they can check there and look on how we progress and how we are doing. (I1, DU 57,59).

This indicates that the qualitative findings are parallel with the quantitative findings.

Sharing online content learning resources

Sharing online content learning resources is defined as textual, visual, aural, images, sounds, videos, animations that online learners use and share throughWeb 2.0 tools such as Moodle (Rosenfeld &Morville, 2002).Referring to quantitative findings, sharing online learning resources using Learning management system (LMS) e.g. Moodle or Blackboard, with 66% of agreement. The qualitative findings also show that students use Web 2.0 tools to share online learning resources:

> Thereare some discussions that we are conducting in this university. So, we need to have these Web 2.0 tools so that we can conduct our discussions. we still share these through online groups. (I2, DU 50, 52, 66).
>
> I always use YouTube. So, I can share (online) learning resources with my friends. (I3, DU 40, 42).
>
> I use these Web 2.0 tools in searching materials, in communicating. I use them for asking questions. I use them in searching. So, I search materials for different purposes in learning. (I1, DU, 16).

Thus, based on both quantitative and qualitative findings, it can be concluded that more than 50% students use Web 2.0 tools to share online content learning resources.

Sharing ideas

Share ideas is referred to as using social networks i.e. Facebook and Twitter which enable students to engage with friends, lecturers and experts in contributing educational thoughts in online learning environment i.e. online

https://dx.doi.org/10.22161/ijaers.6.1.24 *ISSN: 2349-6495(P) | 2456-1908(O)*

discussion forum (McLoughlin& Lee, 2008). Referring quantitative findings, students share ideas through social networks (e.g. Facebook, Twitter) with 94.4% of agreement. The qualitative findings indicate sharing educational ideas among students via social networks:

> There are some students from another colleges or another universities, but we still share these (online) learning resources through online groups(WhatsApps)! And sometimes, even when we are together (still) we can share. (I2, DU 66, 68).
>
> After making our own projects, we always try to put it there on our link. Afterthat we supply(share) to other students so that they can check there and look on how we progress and how we are doing (I1, DU 53,55,57,59).
>
> I always use YouTube.So, I can share with my friends (different contents) for learning. (I2, DU 40, 42).

In addition, YouTube used as platform for sharing educational materials with their friends:

> And also I have got a link which I use usually in YouTube. After making our own projects, we always try to put it there on our link so that we supply to other students so that they can check there and look on how we progress and how we are doing. (I3, DU 57,59).

Other students use You tube for searching video which related to their subjects/courses they take:

> I almost use YouTube to find different videos. (I1, DU 32, 98, 100).

With regard to sharing ideas, normally, people share videos online in order to get connected with others, to get more involved, to support issues that they care about, to get acceptance and recognition from others and to attain their potential in future. This is parallel with Maslow(1954)'s theory which suggests that human being is driven by 5 elements of needs notably, basic needs which include food, water, sex; safety which involves sheltered environment; belongingness which consists of love, affection; self-esteem which comprises self-respect, recognition from others; and self-actualization which encompasses attaining one's full prospective. So, from the findings of this study, students share ideas online based on their belongingness 'sharing with friends'; self-esteem 'showing their project to others'.

Academic /reflective writing

Academic reflective writing is defined as students writing reflectively academic papers or assignments given by their lecturers through Web 2.0 tools such as blogs, then they share with their friends and lecturers to meet their needs and those of others (McLoughlin& Lee, 2007).

The quantitative findings show that students use blogs as their platforms for academic writing to their lecturers and friends with 60.1% of agreement. Moreover, qualitative findings reveal blogs as platform for creating websites and writing academic materials. Students upload them and share with their friends. Some students use these blogs to write academic resources while others use blogs to get answers for their assignments:

> Some students write and use some blogs. Some students have their own blogs. So they can write materials and put in blogs. So you can access to these blogs you find the answers for that. So you compare and you find the answer for that. So, students try to make a blog and create a blog and put some materials which will be better. (I1, DU 18, 28).

Other students upload their contents on blogs as to share with friends:

> we use that blogs for sharing materials during university exams, during assignments from the lectures, we try to share using some blogs. Some students write and use some blogs. Some students have their own blogs. So they can write materials and put in blogs. So you can access to these blogs you find the answers for that. (I1, DU 18, 28).

As a conclusion, students use email to send documents and assignments to their lecturers and to get feedback from them. They use social networks (WhatsApp, Facebook, and Instagram) for interactive learning. They use You tube for sharing educational materials and searching videos. They use blogs for academic writing, getting answers, sharing materials. In general, students use Web 2.0 tools for giving feedback, collaborative learning, sharing academic videos, sharing online content learning resources, sharing ideas and academic/ reflective writing.

Influence of Using Web 2.0 tools and Academic readiness on Cognitive Engagement

This section answers Research Question 3(3.Are there possible effects of Web 2.0 tools on the students' engagement in learning)?Prior to MRA, correlation, ANOVA, mean scores were computed for each construct A

https://dx.doi.org/10.22161/ijaers.6.1.24 *ISSN: 2349-6495(P) | 2456-1908(O)*

Multiple Regression Analysis was carried out to estimate a model fit for its validation and prediction. Enter method was deployed to address research question 3. In this model, use of Web 2.0 tools and Academic readiness were independent variables while student cognitive engagement was dependent variable. R^2 = .211, which means that 21.1% of the variance in the data can be explained by the predictor variable. Table 1.3 shows the model summary.

Table.1.3: Model Summary

Model	R	R Square	Adjusted R Square	Std Error of the Estimate
1	.460[a]	.211	.195	.43227

a. Predictors: (Constant), Acad_readiness, Web2.0_use

Prior to MRA, the researcher must determine if the predicted model is significant via Analysis of Variance (ANOVA). The results indicate that the model is a significant predictor of student cognitive engagement F(2, 97) = 5.684, p = .000. (See Table 1.4).

Table.1.4: ANOVA

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	4.855	2	2.428	12.992	.000[b]
1 Residual	18.125	97	.187		
Total	22.980	99			

a. Dependent Variable: Cog_engage

b. Predictors: (Constant), Acad_readiness, Web2.0_use

To determine the extent the individual predictor variables contribute to the model, the researchers used the coefficient Table. The results indicate that Academic readiness contributed significantly (β = .415, P = .000) while Use of Web 2.0 tools did not contribute significantly (β = .110, P = .249). So, the final predictive model is student cognitive engagement = 3.186+ (.077 Use of Web 2.0) + (.249 academic readiness). See Table 1.5.

Table.1.5: Coefficients[a]

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std Error	Beta		
1 (Constant)	3.186	.269		11.858	.000
Web2.0_use	.077	.067	.110	1.160	.249
Acad_readiness	.249	.057	.415	4.387	.000

a. Dependent Variable: Cog_engage

VI. DISCUSSION

. Web 2.0 tools offer learners to engage students in higher order thinking skills. Involving not just only to understand and apply but also to analyze, evaluate and create through two-way communications and collaborations. Due to the pedagogical potentials of Web 2.0 tools, this study investigated how the students involve Web 2.0 tools in supporting their classroom and out classroom learning activities.

The analysis results indicate that the majority of the students (93% to 94%) use Web 2.0 tools for learning.Regarding Research Question 1(investigating the extent use of Web 2.0 tools in learning), the quantitative findings show that the majority of students who rated between 52% and 94%, use Web 2.0 tools in learning activities which include higher order thinking.The qualitative findings are parallel with the quantitative findings. The majority of the students (82% to 89%) are either already using or are planning to use Web 2.0 tools in learning. Further findings indicate that students' academic readiness in learning, using Web 2.0 tools influences on students' cognitive engagement. Implications of the study show that students' academic readiness in learning through Web 2.0 tools engage their cognitive provided that they are both intrinsically and extrinsically ready, with a conducive learning environment.

https://dx.doi.org/10.22161/ijaers.6.1.24 *ISSN: 2349-6495(P) | 2456-1908(O)*

RECOMMENDATIONS

Based on the findings of this study, the researchers recommend the followings: (i) Higher Learning Institutions (HLIs) in Tanzania in particular, and in the globe at large, should shift from traditional learning to Web 2.0 tools learning environment which is more flexible and interactive. (ii) HLIs should introduce policies on incorporating Web 2.0 tools as to make the 21st century learning skills possible and viable.(iii) Internet connectivity should be upgraded so that students and other online users can access the Internet friendly.(iv) HLIs should introduce ICT training/course starting from the first year students as to enable students utilize the potential of Web 2.0 tools in learning activities.

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