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## **An Assessment of the Extent of Facebook Use by Students at Kisii University, Kenya and Its Implication on Educational Activities**

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### **Authors' contributions**

*This work was carried out in collaboration between all authors. Authors NM, TNN and EA designed the study, wrote the protocol and supervised the work. Author NNA wrote the first draft of the manuscript. All authors managed the literature searches and edited the manuscript. All authors read and approved the final manuscript.*

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### **ABSTRACT**

The study purposed to assess the extent of Facebook use by fourth year Bachelor of Education students at Kisii University, Kenya and its implication on educational activities. Social networking sites allow users to establish networks with other users. This enables communication through platforms such as Facebook and Twitter among others. While these technologies have eased communication a number of problems abound such as distraction of students from their studies. This was a case study in which fourth year Bachelor of Education students were sampled. The participants consisted of 300 Bachelor of Education students 2012/2013 academic year and 5 ICT officials. Stratified random sampling was used to select 86 males and 85 females to make a sample size of 171. The response rate was 83.6% with 143 respondents returning their fully filled up

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questionnaires. Data were analyzed using frequencies, means and percentages and presented in tables. The study established that: 93.7% (134) of the respondents used Facebook and spent on average 115 minutes daily Facebooking. The students were found to be spending much of their time socializing online rather than using the social network for academic use. Based on these findings and conclusions, it was recommended that rather than using Facebook for socialization only; the University management and students should be encouraged to embrace it more as a teaching and learning resource as it had the potential to enhance learning.

*Keywords: Facebook; facebooking; assessment; social networking.*

## 1. INTRODUCTION

In the recent times, there has been a rapid expansion of technology with new ways of teaching and learning being incorporated in education. In a bid to move with the changing times, countries in the world have gone ahead to heavily invest in Information Communication Technologies (ICT) and Kenya has not been left behind. The government has developed policies to enhance use of Information Communication Technology in Education so as to promote teaching and learning. The government has invested heavily in ICT through initiatives such as e-government, e-commerce, mobile telephony, offshore cable networks and Wezesha. In the latter, the World Bank sponsored acquisition of laptops by university students [1].

After several years of effort, Kenya promulgated a National ICT Policy in January 2006 that aimed to improve the livelihoods of Kenyans by ensuring the availability of accessible, efficient, reliable and affordable ICT services. The national policy has several sections, including information technology, broadcasting, telecommunications, and postal services. However, it is the section on information technology that sets out the objectives and strategies pertaining to ICT and education. The relevant objective in this section states that government will encourage the use of ICT in schools, colleges, universities and other educational institutions in the country so as to improve the quality of teaching and learning [2].

In this same spirit Kenyan universities have gone ahead to invest in ICT infrastructure due to the anticipated advantages expected in knowledge creation and dissemination. All these concerted efforts from the government and the universities have led to the spread of internet use in the country. This has led to a steady increase of use of the internet in the country with the number of internet users rising from 13.1 million to 13.3 million as at March 2014 [3].

This investment in ICT has led to an increase in internet use in the country which is a positive step towards utilizing new ICTs in education. However contrary to expectations, it has been reported that the rapid growth and penetration of internet services is being propelled by the popularity in use of social networking sites [3]. Use of social networking sites is a new trend of online socialization that has become common especially among young people. This has led to a tremendous growth in user generated content increasing the ability for individuals to share and collaborate online. Several social networking sites exist among them Facebook, Twitter, Skype and MySpace. However, Facebook seems to be spearheading this new phenomenon; being the most widely used social network in the world. Facebook statistics indicated that as at 30<sup>th</sup> June 2014 there were 1.32 billion monthly active users. 654 million of these users used Facebook on mobile devices daily [4].

Although Kenyans use a number of social networks, Facebook has the highest number of subscribers as compared to the other social networking sites. Given this popularity, the study therefore chose to focus on the extent of Facebook use by fourth year bachelor of education students at Kisii University. Facebook statistics per region and country indicated that in the USA 22.4% of Facebook users fell under the 18-24 years old bracket. In East Africa 45.23% of Facebook users fell under the 18-24 years old bracket. In Kenya 40.6% of Facebook users fell under the 18-24 years old bracket [5].

Facebook features make it an appropriate platform for communication among a large group of people in institutions like universities. Posting on one's wall enables all contacts or friends in ones' list to view their posts, comment on them and share them with others. Similarly people with similar interests can create a group in which others are invited and they can share information in such groups. Groups can either be open or closed. Open groups have pages that do not

restrict access while closed ones have restricted access. In a bid to foster information, several universities have added Facebook links to their websites to ease communication. Facebook has been found to reach many people with little effort hence its' popularity.

Ajjan and Hartshorne [6] indicated that social networking tools can be used to support educational activities by making interaction, collaboration, active participation, information and resource or material sharing possible. Other studies revealed that social networking sites if used well could improve the academic outcomes of students.

Through social networking, students have transparency among each other and socialization on the other hand, leading to collaboration on their works, productions and ideas. Things like notes, literatures, assignments and other related information are shared. Anyone among their friends or rather participants can have access and view, modify or develop content found on the others' profile or personal pages. The collaborative web is rich in applications that can facilitate knowledge sharing, interaction, collaboration and communication.

Contrary to this, other scholars have established that apart from the potential that Facebook has in supporting learning, there could also be disadvantages in using Facebook. Some of these disadvantages are such as waste of time [7], procrastination and changing priorities [8], waste of money (because of additional expenses for surfing), and even addiction [8].

### **1.1 Extent of Facebook Use by University Students**

Facebook as a social network was initially created for use by university students and incidentally remains very popular among many university students to date. It was found that adolescents and young adults are the common users of social networks which are the latest online communication tool that allows these users to create a public or private profile to interact with people in their networks [9]. It was also found out that today's students communicate and network with each other through technologies as much as if not more than, face to face communication [10]. These studies established the role Facebook played in improved communication among the university

students but did not examine the extent to which students used Facebook.

Lampe, Ellison and Steinfield [11] found that 94% of the students interviewed during their study had a Facebook account and used it on average 10-30 minutes a day. Recent studies have further shown that many college students spent averagely 3 hours a week on Facebook [12,13]. They explained that some students were even devoting more time towards Facebook activities than studying their course work. These studies were carried out in the developed world where computers are easily accessible. They relied on online data collection methodologies which cannot be used in a developing country like Kenya as it would definitely disadvantage the respondents. This is because in Kenya, majority of the people access the internet using mobile phones. Therefore the present study differs in data collection whereby a self administered questionnaire was deemed to be an appropriate instrument for data collection. Bosch [14] in a study carried out in the University of Cape Town in South Africa found out that majority of the students used Facebook. According to this study it was revealed that students perceived Facebook as a rite of passage, and first year students without Facebook profiles immediately signed up when they arrived on campus. The students were found to be using the social network for social communication and to a lesser extent for academics.

Junco [15] observed that college students spent a great deal of their time using Facebook as the social media service of choice. Students increasingly utilized Facebook for friends' news feeds, personal updates, events and activities, notes and messages. Another study by Pempek, Yermolayeva, and Calvert [16] found that Facebook was used mainly for social communication, mostly with friends with whom the students had a pre-established offline relationship as well as new friends forged online.

Another study by Aghaee [17] found out that students used social networks like Facebook to support cooperative learning. In the study it was reported that Instant messaging (IM) is used for learner-learner interaction. Some of the students believed that synchronous social media is significantly supporting students' collaborative and cooperative learning. Students communicated via IM or social networks, in order to plan appointments, while collaborating on group-work. Furthermore, learners supported

cooperation works, as they mentioned, by working individually in different places and consulting with each other from a distance, via social media to get direct reply or new ideas, besides sending their sub-tasks to other group members. According to the students, if one of the group members could not come to the meeting, then they could be online and still kept contact instantly with the missing person. In cooperative work, learners could share ideas and documents, or upload the latest version of their works to be accessible by other members from anywhere, at anytime. The students similarly reported that they could communicate via Facebook to ask concrete questions and get a quick reply, since students were used to checking their Facebook so often. Equally they made closed groups for arranging appointments for studying together. Anyone could put information there, available for the other members of the group, and others who were interested could pick the data and use it. While this study just focused on the students' perceptions on how social media supports educational learning, it did not assessment the extent to which the students used Facebook for other activities.

In a study by Shembilu [18] students in a Tanzanian University revealed that they sometimes used discussion groups via Google or Facebook based on their courses and interests. 96% of the respondents in their study were found to use Facebook as their most favourite social networking site. Ulusu [7] examined key factors affecting the time users spent on Facebook and found that as people became addicted to Facebook they tended to stay online longer, especially in order to communicate with other users. Clearly there is little documented evidence of the amount of time spent on Facebook by students in developing countries and more specifically in Kenya where internet technologies growth are rapid and widespread. Therefore the study sought to examine the extent of Facebook use by fourth year Bachelor of Education students and its implication on educational activities. This study results can be generalized to the students at Kisii University.

## **2. RESEARCH DESIGN AND METHODOLOGY**

### **2.1 Participants**

The study was carried out in Kisii University main campus situated in Kisii County which lies within coordinates of Latitude: 0°41' 26" South and

Longitude: 34°46' 20" East with an elevation above sea level of 1789 m=5869 ft. The participants were three hundred fourth year Bachelor of Education students of 2012/2013 academic year. The study also targeted 5 ICT officials.

### **2.2 Research Design**

The study adopted a mixed method research design that entails collecting, analyzing, and critiquing outcomes through quantitative and qualitative research paradigms. Methodological triangulation was done through questionnaire and interviews data collection to validate regularity of data while data triangulation was used to obtain data from fourth year students and ICT administrators on the most popular gadgets used to access Facebook. This is in line with Denzin [19].

### **2.3 Sample Size and Sampling Procedures**

Using Taro Yamane's simplified formula as cited by Israel [20], at 95% confidence level and  $P = 0.5$ .  $N =$  Size of population,  $n =$  sample size, and  $e =$  precision of 5% a sample size of 171 was obtained out of the 300 fourth year Bachelor of Education students 2012/2013 academic year. Further, to give a fair representation of both genders stratified random sampling was used to obtain a representative sample of 86 male and 85 female to make a sample size of 171.

### **2.4 Data Collection**

This study relied on a semi structured questionnaire for data collection from the students. The questionnaires were distributed to the students and collected at an agreed time. An interview guide was used to obtain information from ICT officials. The interview tool was divided into three parts. The introductory part gave information about the procedure of the interview and sought consent from the interviewees. The second part sought information on the interviewees' background and the third part contained the questions for the respondents. The questions asked sought to find out how internet was being used in the university; if the students were using any social networking sites, and if so which ones were they? Of the sites being used which one seemed to be the most popular and finally what devices were mostly being used by the students to access Facebook.

## 2.5 Data Analysis

Quantitative data obtained was coded and analyzed with the aid of SPSS version 19. Descriptive statistics was used to obtain frequencies, percentages and means. Qualitative data obtained from open ended questions in the questionnaire were transcribed then edited to get meaningful data. Using a general inductive approach, data were analyzed qualitatively using content analysis based on analysis of meanings and implications from the respondents' responses. Major themes were identified and categorized. Patterns were identified and connections within and between categories established [21].

## 3. RESULTS AND DISCUSSION

### i) Gender Distribution of Respondents

Table 1 shows the proportion of male and female respondents who answered the students' questionnaire.

**Table 1. Gender distribution of respondents n =143**

	Frequency	Valid percent
Male	75	52.4
Female	68	47.6
Total	143	100.0

Source: Field data (2014)

### ii) Access to Facebook

To find out if fourth year Bachelor of Education students used Facebook, the sampled respondents were asked whether or not they had an active Facebook account. The following table presents their responses to the question.

**Table 2. Do you have an active facebook account? n =143**

	Frequency	Percent
Yes	134	93.7
No	09	6.3
Total	143	100.0

Source: Field data (2014)

Based on the study findings on the question whether the respondents had active Facebook accounts, Table 2 reveals that 134 (93.7%) had

Facebook accounts while 9 (6.3%) did not have Facebook accounts. The 9 respondents who answered 'No' were asked in an open question to give reasons why they had not signed up. The themes identified from the responses were that Facebook was a waste of time as stated by 4 respondents, 3 indicated a lack of interest in signing up on Facebook because it was nasty while 2 indicated that they had initially signed up but after having negative experiences in their social lives had deactivated their accounts. This is illustrated in Fig. 1 on pg 170.

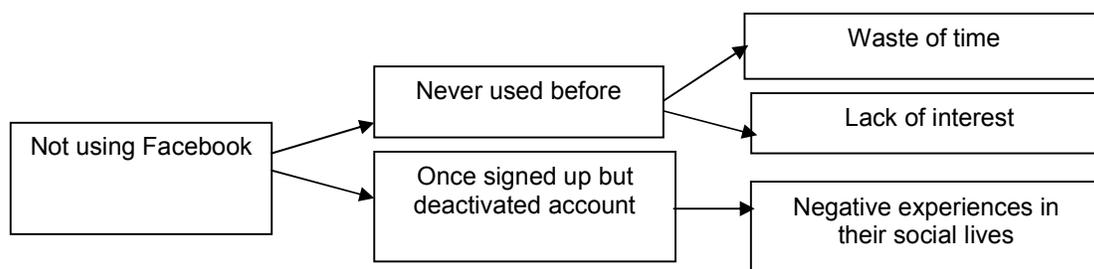
In an interview, 2 ICT administrators were asked which social sites were commonly used by the students and which was the most popular one. The administrators' responses were as quoted below. Respondent A said that "...the students like to use Facebook and Twitter. However I think Facebook is more common because of its nature. The students like to chat with their friends as well as post and follow news feeds" Respondent B reported that "...according to my observation, the students mostly use Facebook with a few using Twitter". From these responses the themes established were that Facebook was the most commonly used social network by the respondents.

Therefore, the analysis and interpretation according to data obtained from the students and the ICT administrators indicated that Facebook site was most preferred by 93.7% of the students. This was also asserted by the ICT administrators who noted that students commonly used Facebook. This triangulation is indicated in Table 3. This corroborates with studies by Lampe et al. [11] and Bosch [14] which found that 94% of the students interviewed during their study had a Facebook account. In spite of geographical and time differences since the Lampe et al. study was conducted it affirms that Facebook still remains a favourite among University students across the continents.

**Table 3. Showing results of ICT administrators and students triangulated data**

Respondents	Data collection method	Data outcome on most preferred site	Percentage of students using facebook
ICT administrator	Interview schedule	Facebook	93.7
Students	Questionnaires	Facebook	94

Source: Author (2014)



**Fig. 1. Reasons given for not using facebook**

Source: Field Data, (2014)

**iii) Length of time spent on Facebook**

To measure extent of Facebook usage, the respondents were asked about the length of time they had been signed up on Facebook. Table 4 below presents the findings

**Table 4. For how long have you been using facebook? n=143**

Length of time	Frequency	Valid percent
Under 1 year	01	0.7
1-3 years	57	39.9
4-5 years	59	41.2
Over 5	17	11.9
Missing	09	6.3
Total	143	100.0

Source: Field data (2014)

As presented in the Table 4, 'the' study findings revealed that the respondents had been using Facebook for quite some time with 59 (41.2%) respondents saying they had been using Facebook between 4 and 5 years. 57(39.9%) had been using Facebook between 1 and 3 years. 17(11.9%) had even started using the social network before joining university as they said they had been using Facebook for over 5 years. A negligible number 9 (6.3%) of the respondents were not using Facebook and only 1(0.7%) respondent had used it for under a year.

**iv) Devices mostly used to access Facebook**

As illustrated in Table 5, the findings show that the students used a wide range of devices namely laptops, mobile phones, university computers and cyber café computers. However majority of the respondents 122(85.3%) used their mobile phones, 7(4.9%) used their laptops, 3(2.1%) used computers in a cyber café while 2 (1.4%) used the university computers, 9 (6.3%) respondents were not using Facebook. The

mobile phone was found to be the one majorly used to access Facebook. This high prevalence in use of phones can be attributed to availability of cheap mobile phones (smart phones) that are internet enabled. In addition these phones were WI-FI enabled which meant that students could access internet at no charges within the campus. Even without WI-FI mobile subscriber services were offering internet bundles at low costs which enabled the students to access internet on their phones. Laptops were not commonly used because despite efforts to avail them to university students through initiatives like Wezesha Laptop project, their cost was still beyond majority of the students reach. Accessing the internet in cyber cafes which are normally commercial enterprises meant that students had to pay to use the service. This made them an expensive venture so students avoided them hence they too were uncommon.

**Table 5. What devices do you mostly use to access Facebook? n=143**

Devices used	Frequency	Percent
Laptop	07	4.9
Mobile phone	122	85.3
University laboratory/library	02	1.4
Computers		
Cyber café computers	03	2.1
Missing	09	6.3
Total	143	100.0

Source: Field Data (2014)

In the interview with the two ICT administrators they were asked what devices the students used mostly to access Facebook. Their responses revealed that the university had a policy prohibiting use of social networks in the university computer laboratories and the library and for that reason most students resorted to using their mobile phones. Respondent A reported this:

Most students use their mobile phones rather than the university computers. The university has an ICT policy which was put into place in 2012 and was revised in November 2013. The policy stipulates that no student is allowed to use social media in the university computer laboratories and library computers (ICT administrator).

Respondent B reported that:

The University has policies that prohibit use of social networks and other sites that are blocked. Further to this because social media is very time consuming students are not allowed to use them on the university computers as the computers are limited and have to be shared among many students, so many use their mobile phones instead (ICT administrator).

Fig. 2 on pg 172 illustrates the analysis of interview data.

Based on these findings from data obtained from the students and the ICT administrators, it was established that majority, 85.3% of the students were using mobile phones to access Facebook. Therefore although the university computer laboratories would have been enticing to the students as they had free internet, the policy prohibiting students from accessing social networks and in extension Facebook made it uncommon among the respondents.

**v) Frequency of Access to Facebook Account**

The respondents were asked how often they accessed their Facebook accounts; Table 6 presents the findings as follows.

The results as indicated on Table 6 show that the respondents were actively using their Facebook accounts. The results indicated that the respondents checked their Facebook accounts daily with majority of them that is; 83 (58%) accessing their accounts more than 5 times a day. Another 29 (20.3%) respondents accessed their accounts at least once a day. Only 4 (2.8%) respondents accessed their accounts once a month while 9 (6.3%) were not signed up on Facebook.

**Table 6. How often do you access your Facebook account? n =143**

Frequency of access	Frequency	Valid percent
More than 5 times a day	83	58.0
Once a day	29	20.3
Once a week	18	12.6
Once a month	04	2.8
Missing	09	6.3
Total	143	100.0

Source: Field data (2014)

**vi) Time that Respondents Spend on Facebook Each Time They Log into Their Accounts**

The study sought to find out how much time the respondents used, each time they logged into their Facebook accounts. Table 7 presents the findings.

**Table 7. Each time I log in, I stay online for approximately n = 143**

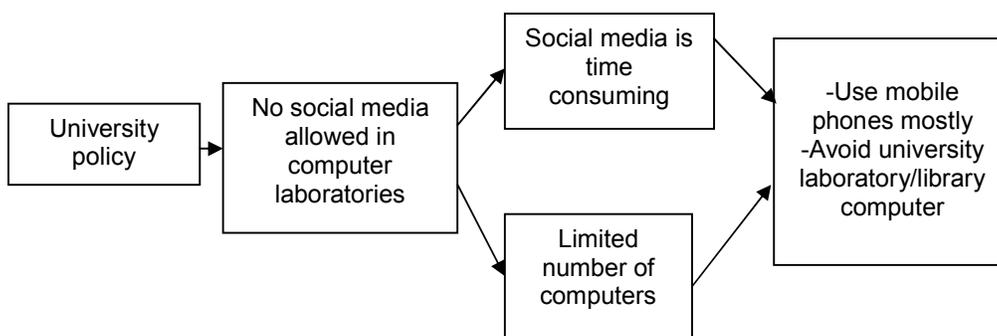
Log in time	Frequency	Percent
Less than half an hour	65	45.5
30 minutes to 1 hour	39	27.2
1.5 hours to 3 hours	14	9.8
More than 3 hours	16	11.2
Missing	09	6.3
Total	143	100.0

Source: Field data (2014)

The results in Table 7 indicated that most of the respondents 65 (45.5%) did not spend so much time on each log in as they were found to be spending less than half an hour each time they logged in. 39 (27.2%) respondents used between 30minutes and 1hour. Those who spent the highest time 16 (11.2%) were found to have been spending more than 3 hours while 9 (6.3%) did not use Facebook.

**vii) Average Time Spent on Facebook per Day**

The respondents were asked how much time they spent on Facebook per day. Table 8 illustrates their responses.



**Fig. 2. Devices mostly used to access Facebook**

Source: Field data (2014)

**Table 8. Time in minutes spent on Facebook per day on average how much time per day do you actively spend on Facebook? n= 143 (Time shown in minutes)**

Time (minutes)	Frequency	Percent
00	09	6.3
30	11	7.7
45	03	2.1
60	33	23.1
90	04	2.8
105	04	2.8
120	37	25.9
150	04	2.8
165	03	2.1
180	20	14.0
240	07	4.9
285	01	0.7
300	06	4.2
360	01	0.7
Total	143	100.0

Source: Field data (2014)

$$\text{Mean} = \frac{\sum \text{time} \times \text{frequency}}{n}$$

$$\text{Mean} = \frac{16,485}{143} = 115 \text{ minutes}$$

As shown from the results from Table 8, on average respondents used 115 minutes (1 hour 55 minutes) per day on Facebook. 37 (25.9%) used 120 minutes per day. 33(23.1%) were spending 60 minutes (1 hour) per day.

33(23.1%) were spending 60 minutes (1 hour) per day. The minimum time used on Facebook by those subscribed to the social network was 30 minutes per day with the maximum time being 360 minutes (6 hours). Most students used their mobile phones to access Facebook; this implied they had more opportunities for internet as well

as Facebook access. The students were found to be spending a reasonable amount of time on the social networking site with the mean time spent averaging 115 minutes (1 hour 55 minutes) per day. However, this is higher than what is reported in a study by Lampe et al. [11] that found out that students tended to use an average of 10-30 minutes per day and averagely 3 hours a week. In Schulten’s study of 2009 students were found to be spending an average of 30-35 minutes per day on Facebook.

**viii) Activities Carried Out on Facebook**

The study sought to find out the activities that the students carried out on Facebook. They were asked if they were always engaging in the mentioned activity each time they logged into Facebook. The respondents were expected to choose one of the responses as follows: Strongly disagree (SD), Disagree (D), Agree (A) and Strongly Agree (SA).The activities in question were: posting status and pictures and commenting on their friends’ status, wall posts and pictures; sending private messages (inbox); chatting on Facebook; searching for new friends, sending and accepting friend requests and discussing academic matters. Table 9 presents the findings.

The study findings from Table 9 indicated that the most favourite activity among the respondents was chatting in which 97(67.8%) of the respondents agreed to always chatting with their friends every time they were on Facebook with 37 (25.9%) respondents disagreeing to doing this each time they were logged on. 89 (62.2%) respondents agreed to always posting status, pictures and videos as well as commenting on the same with 45 (31.5%) disagreeing to this. 86 (60.1%) respondents said they were always searching, sending and

**Table 9. Every time I am on Facebook I carry out the following activities n=143**

<b>Activity</b>	<b>SD</b>	<b>D</b>	<b>A</b>	<b>S A</b>
Posting & commenting on status	11(7.7%)	34(23.8%)	75(52.4%)	14(9.8%)
Sending private messages	28(19.6%)	25(17.4%)	64(44.8%)	17(11.9%)
Chatting	07(4.9%)	30(21%)	77(53.8%)	20(14.0%)
Searching, sending & accepting friend requests	05(3.5%)	43(30.1%)	73(51%)	13(9.1%)
Discussing academic matters	45(31.5%)	40(28%)	43(30.1%)	06(4.1%)

Source: Field data (2014)

accepting friend requests with 48 (33.6%) disagreeing to doing this; while 81(56.7%) respondents said they were always sending private messages or in boxing in Facebook lingo with 53 (37%) disagreeing to doing this always. Only a small number 49 (34.2%) respondents said they were always using Facebook for academic activities any time they were logged on to Facebook with 85(59.5%) disagreeing to always doing this each time they were logged on. The students were found to be mainly using Facebook for socialization with their favourite activity being chatting. The high frequency could be attributed to the fact that chatting involved a one to one online conversation with instant feedback unlike sending private messages to the inbox which did not guarantee an immediate feedback. This is in consonance with a study by Junco & Cotten [22] that found that 75% of their study participants reported multitasking instant messaging (IM) and studying. The fact that the students liked to socialize implies that students were always eager to know what was going on around them and to let their friends know what they were up to. The fact that the students used Facebook mainly for socialization contrasts a study by Aghaee [17] which found out that students used social networking sites like Facebook to support co-operative learning. Despite the numerous benefits of social networks like Facebook and MySpace as outlined by researchers at the University of Minnesota only 34.2% of the students in this study were using it to discuss academic matters. This implied that the great potential offered by Facebook as a learning tool was not being fully utilized by the students.

#### 4. CONCLUSION

The study aimed at assessing the extent to which Kisii University fourth year Education students used Facebook. The findings revealed that

93.7% of the students used Facebook. It was also found out that the students spent a considerable amount of time on Facebook with those spending the least amount of time using on average 13 hours 25 minutes a week and the highest time spent being 42 hours a week. 78.3% of the respondents checked their accounts daily with 58% of them checking their accounts more than five times a day. It was also found that students mainly used Facebook for social activities rather than for academic activities. It was therefore concluded that use of Facebook was popular among the university students and that they were spending a considerable amount of time on the social networking site socializing rather than on academic activities. This is in contrast to the study by Aghaee [17] that established that apart from socialization Facebook can be used to support co-operative learning. In this study students were found to be utilizing instant messaging to share class work content. They could collaborate on group work by working individually in different places and consulting with each other from a distance, via social media to get direct reply or new ideas, besides sending their sub-tasks to other group members. Therefore instead of the university prohibiting use of Facebook in the university computer laboratories, Kisii University management and management in other universities should develop policies that promote the use of Facebook as a learning tool since it is popular among students and has the potential of being used as a learning and teaching resource.

#### 4.1 Implications

Based on the fact that 93.7% of the respondents were using Facebook and were majorly using it for social activities, it is recommended that lecturers should encourage the students to consider using Facebook as a tool for learning and communication. To ensure that use of

Facebook is beneficial to the learners; lecturers should educate and guide the students to take advantage of technology and Facebook in particular, for positive academic outcomes. Instead of only using it for socialization they should also use it for academic purposes. Lecturers could develop ways of incorporating the use of Facebook as a tool of communication and learning. Facebook can be used by learners and lecturers to share notes, facilitate discussion on educational topics, schedule classes and give updates on university or class news. Therefore if properly used Facebook like any other social media can shape learning and improve academic achievement.

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### COMPETING INTERESTS

Authors have declared that no competing interests exist.

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