

Strengths in Using Social Media Facebook as an Educational Technology

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Received: 24.01.2019

Accepted: 11.06.2019

Abstract - Though the social media Facebook was not originally an educational technology, its innovative use in teaching and learning may be the only e-learning experience students and teachers in resource-poor areas may have. Such use also has the potential to solve the globally highlighted problem that Facebook distracts students. Amidst peculiar challenges (poor technology skills, low-speed and unstable Internet connection and treacherous power supply) fifteen lecturers and their 2,019 students—motivated through participatory learning and action—agreed, learned, implemented, observed and evaluated their academic use of Facebook in four semesters. Data collected through questionnaire and periodic face-to-face and online interviews showed, among others, 56% of students understood course topics more; 92% collaborated more than they did elsewhere; 72% participated more in class discussions;. 70% spent for course activities on Facebook 80% of the time they used to spend on Facebook. Impact on students' grades needs an investigation.

Keywords: Facebook, educational technology, e-learning, social media, teaching

Introduction

Globally, very many higher education teachers cry aloud against the extent to which Facebook distracts students (Al-Rahmi et al., 2014, Junco & Cotten, 2012, Chen & Bryer, 2012, Dahlstrom et al., 2011, Junco, 2011, Roblyer et al., 2010, Ajjan & Hartshorne, 2008). Yet nobody has been able to stop students from using Facebook for what it really is. Adekunle (2018, p. 38) while describing trends in using social media as substitutes for class interaction, observed: "...students in Nigeria use social media more for entertainment than for academic engagement."

It is noteworthy that social media (including Facebook) were not developed as educational technologies. Their developers intended them for networking and socializing, specifically for sharing information over the Internet (Reuben, 2008) not only through text, pictures and videos but also as audio recording. Using social media for these purposes is a global practice, and nothing truly is wrong with that. What is wrong is that students socialize and network on Facebook to such a degree that they pay less attention to their academic obligations.

Andersson et al. (2014) surveyed the experiences which teachers and students in three schools in Sweden had while using Facebook as a social medium. The researchers' respondents were unanimous that use of Facebook distracted students from learning and teachers could not strategize toward addressing the challenge. Hence, the researchers called for urgent measures to rescue students. The call might be because attempts already made by many educators to engage students on Facebook still had not addressed the challenge. In fact, Rockmore (2014) reported that when students had laptops during class sessions, teaching through Facebook distracted the students such that some computer science professors in the United States of America (USA) argued for banning use of laptop during lectures. Other authors who reported on attempts to engage students on Facebook include Matzat and Vrieling (2015), Bugler (2014), Yang et al. (2014), Megele (2014), Goodband et al. (2012), Lam (2012), Willems and Bateman (2011), Bosch (2009) and Sendall et al. (2008). Only two of these attempts (those of Bugler and Bosch) were in African institutions. Lecturers in Bosch's report used Facebook only for contacting students more easily and quickly, while in Bugler's report, students used Facebook for only sharing resources. Although Facebook was created for social

communication, there still should be ways of using this communication function for noticeable good academic impact. This relates to why Al-Rahmi et al. (2017) investigated the use of Facebook and other social media for collaborative learning and engagement, but they explored this only in the learning of Quran and Hadith. They reported students' responses that they (students) had used social media for collaborative learning, sharing, discussion and publishing. The responses seem predictive and yet to be proved, considering the authors' statement that the students *believed* that social media *could* be used positively and... *could* provide significant interaction, engagement and collaborative learning. In an experiment earlier, Tananuraksakul (2015) found that students developed positive attitude and motivation to learn English when Facebook was incorporated into an "English as a Second Language" class in a Thai university. Since Facebook could engender in students such positive attitude and motivation to learn, there is possibility that Facebook can become more attractive than distractive to learning not only Quran, Hadith and English but also many other subjects. It is, therefore, needful that teachers and students in various disciplines should be helped to together use Facebook innovatively, beyond its social interaction purpose, as an educational technology.

Popularity and Educational Potentiality of Facebook

Facebook is an online social medium with a physical office in Menlo Park, California. It was developed by Mark Zuckerberg in 2004 (Mitchell 2012) and helps a person to connect with other persons (relations, friends and new people) for sharing information as text, photographs, audio recording and videos. Because of what it does and how popular it has become, used by people of all ages and various vocations, Facebook is among today's frontline information and communication technologies (ICTs).

Of 4,156,932,140 Internet users in the world as at 31 December 2017; 453, 329,534 (10.9%) were in Africa ([<https://www.internetworldstats.com/stats1.htm>]). Over 52% of the world's Internet users were monthly active users of Facebook in that period, and 79% of them used it on mobile devices (<https://www.statista.com/statistics/264810/number-of-monthly-active-facebook-users-worldwide/>). Africans on Facebook at the time were 177,005,000 (8.4% of the global figure) (<https://www.internetworldstats.com/stats1.htm>). A study in Australia found that <http://www.facebook.com> ranked fourth among Web sites most visited (Ng 2010). As in the United Kingdom (UK) where 95% of people aged from 14 to 34 years registered on at least one online social medium (Social Media Experts 2011), most Facebook users (82%) in the world are below 45 years (<https://www.statista.com/statistics/376128/facebook-global-user-age-distribution/>). This suggests that very many youths who are in higher education institutions are on Facebook. Whatever they do there that is irrelevant to their studies, and however often they do it, they enjoy it and, as affirmed by El-Hoby and Zeki (2015) and Brady et al. (2010) more students are signing up. That texts, photographs, audio recording and videos are shared free-of-charge through the medium is an opportunity which educators must seize to reduce the negative impact of students' use of Facebook and to enhance learning and teaching in higher education institutions. Sendall et al. (2008) were right when they observed, in the use of Facebook in three universities in the USA, that skills in using Facebook and other social media were generally essential in university education.

Also, "New types of learning activities challenge our thinking as to how learning might be facilitated, creating new etiquettes of learning and teaching, and shifting the locus of control from the teacher to the learner" (Littlejohn et al, 2006). It was in the 1990s that many new thoughts about learning arose, chiefly from Vygotsky's socio-cultural psychology and Engeström's activity theory. The resultant student-centred learning, extensively propagated by cognitive learning theories, is the focus of quality education at present and will remain in

future education. For learners to actually control their learning, they need to be only guided and given freedom to discover knowledge through harmless activities, fora and media that appeal to them. Facebook has these three fronts and so lends itself well to enhancing learning if it is adapted to users' peculiar circumstances.

Research Objectives

There are more hours outside the physical classroom than inside it, and, as already noted, the time higher education students spend on Facebook (usually with their mobile phones) outside the brick-walled classroom doing what is unrelated to their academic programmes is a great concern. Again, students lose so much time, which negatively affects their learning, when lecturers miss lectures to go for necessary fellowships or sabbatical leave or to attend inevitable conferences and other meetings. As in many HEIs globally, these are top-level challenges added to technical and monetary difficulties students and faculty face in a Nigerian university. Consequently, the project set out to achieve the following:

1. Discover whether students can use Facebook more for academic activities than for activities unrelated to course work;
2. Discover how lecturers can engage students on Facebook when being absent in the physical classroom is inevitable;
3. Discover how students and lecturers can cope with economic and infrastructural challenges associated with use of the Internet (on which Facebook is) in African HEIs;
4. Discover gains and losses not mentioned in existing literature, of using Facebook for learning and teaching in HEIs;
5. Make recommendation(s) for or against use of Facebook in learning and teaching.

Technologies Used in the Project

The Internet, Facebook and Wi-fi-enabled laptop computers or mobile phones were the fundamental technologies used in this project. The mobile phones had WAP (Wireless Application Protocol) or GPRS (General Packet Radio Service) or EDGE (Enhanced Data rates for Global Evolution) or HSDPA (High Speed Downlink Packet Access) or 3G/4G/5G (3rd/4th/5th generation of cellular network) and could also download and upload files to Websites. Wi-fi enables a computer to connect to the Internet through a wireless local area network (WLAN). WAP, GPRS, EDGE, HSDPA, 3G, 4G and 5G enable mobile phones to connect to the Internet.

Methodology

This is an action research or a field study done over two years, spanning four semesters. Because it involved the adaptation of a non-traditional learning technology in an environment where ICTs are being newly embraced, ethnographic methodology with participatory learning and action (PLA) was used. Ethnographic methodology is a participant-observation method involving one investigator who lives both with and as their research participants (Genzuk, 2003, Harris & Johnson, 2000, Van Maanen, 1996). It, therefore, recognized the setbacks and challenges of students and lecturers in the university where the work was done, and data in this report came mainly from participants' observations and experiences. Participants, who were selected and trained through PLA, were involved fully in planning and execution of their training and the project. They observed their individual and collective academic use of Facebook in relation to what they knew Facebook to be.

1,700 lecturers received e-mail call for participation. 650 expressed interest. A rigorous, online task-based process produced only fifteen (15) lecturers who had the required level of

interest, ICT literacy and suitable devices and would commit time and resources voluntarily. The fifteen lecturers taught 2,019 undergraduate students in the following academic programs: History and International Studies, Linguistics, Arts Education, Health and Physical Education, Social Science Education, Vocational Teacher Education, Microbiology, Electrical Engineering, Civil Engineering, and Medicine.

In accepting to participate, participants considered that Facebook was available and familiar to them. Students confirmed their familiarity with the technology when they were asked to list ICTs they had been using privately for other purposes and never knew they could be used in learning or teaching (Table 1). Throughout the project period, participants provided technical support for one another within their abilities to do so. A participant who had any challenge reached out to others through an e-mail list for the project or through phone calls. The researcher who was the only ICT and e-learning specialist in the team handled cases that were beyond participants' abilities.

The researcher collected data through questionnaires and periodic interviews, selecting students at random for interview. While all participants got questionnaire (containing structured questions) at the end of each semester and of the project, only fifty students (five students in each of the ten programmes) and all the fifteen lecturers were additionally interviewed with unstructured questions. Participants received questions in search of how much they used ICT (particularly Facebook) before the project, what they actually did in the project, setbacks, any positive and negative impact, their perception of the academic use of Facebook, and strategies for progress. Some interviews were face-to-face. Others were online through chats on Facebook. By e-mail, participants received and submitted the questionnaires created with Google Forms™, which is an online survey tool (<https://www.google.com/forms>) that automatically collates and charts data fed into it. Analyses of data were both quantitative and qualitative.

Findings and Discussion

Student-participants in this project and their lecturers had been using ICTs before the project began, except only 3% of the students who claimed they had not used any form of ICT. Interestingly, none of the participants (both students and lecturers) had ever used any ICT in their teaching or learning. With a pre-project interview through which they made these revelations, the researcher also found that the lecturers frequently went online (through campus WLAN or by using a mobile phone data connection when the WLAN was weak) mainly in search of resources for their research or to submit manuscripts. A vocational teacher education lecturer said:

I never knew or even thought of the Internet and mobile phone as teaching apparatus. I use my phone only for calls and text messages (personal and office) and the Internet for e-mail and my researches mainly. I sometimes connect to the Internet on my phone anyway.

Below are the words of another lecturer, in Department of Microbiology:

I've been on Facebook and WhatsApp, both of which I often access on my smartphone. I post and read things, send and receive messages, upload and download photos and videos, but only to and from relations and friends. So, I'm excited that Facebook can be a teaching tool and can't wait to try it out. That's why I'm eager to participate in your project.

All the lecturers had the appropriate computers and mobile phones with which they connected to the Internet and accessed Facebook throughout the project duration.

The students had used different forms of ICT (specifically nine, as on Table 1). Six of the ICTs, including Facebook, were for communicating and sharing information in various formats, which implies that the students must have been using them to communicate with relations and friends, just as their lecturers were doing. but only 10% had not used Facebook (Table 1). Tables 2 and 3 contain the trend of ownership of required computers and mobile phones by the students during the project period. The two tables have further descriptions of the students' computers and phones. These tables are significant, because they highlight the possibility that students will be motivated to invest in technologies for their learning when Facebook (or other social media and communication technologies which students are fond of) are creatively used as educational technology. This has proved **one gain of using Facebook in teaching and learning, not mentioned in existing literature**. A food for thought then for educators and education administrators/policy makers is that technologies students frequently use, even when they are not traditionally related to education, are good resources to start with when stepping toward technology-enhanced learning. A remarkable advantage the students also exploited is that they always had their mobile phones on them and could access Facebook on the phones. This points to the role of mobile technologies in learning, as United Nations Educational, Scientific and Cultural Organization (UNESCO, 2012) described them as having great potential to help teachers improve learning outcomes, both in and out of the classroom.

Table 1

Forms of ICT which students were using privately for purposes other than their university education, before commencement of project

ICT used before start of project	Number of students who used it	Percentage of 2,019 students
Facebook	1820	90
E-mail	1190	59
Mobile phone	2019	100
Yahoo Messenger or any other instant messenger	630	31
Skype	210	10
Google Talk (Hangout)	420	21
Digital video and audio	420	21
Digital photography camera	350	17
Microsoft PowerPoint	350	17
None other than mobile phone for call and text messaging	70	3

Table 2
Students' ownership of personal computers and mobile phones in Semester 1 of Year 1, when project took off

Students who did not own computer 38%	Students who owned computer 62%		All the students owned mobile phone 100%				
'You don't own a computer, do you plan to own one?'	0% of computers were desktop	100% of computers were laptop	3% of phones couldn't connect to the Internet	97% of phones could connect to the Internet (that is, they were Internet-capable)			
10% No	90% Yes	89% of the laptop computers had Wi-fi	11% did not have Wi-fi	28% of Internet-capable phones couldn't download and couldn't upload files	44% could download and upload files	28% could download but couldn't upload	

Devices that could connect to the Internet and could download and upload files were necessary for the project. Those students (3%) whose phones could not connect to the Internet in Semester 1, Year 1 (Table 2) and in Semester 2, Year 1 (Table 3) came into the second year with Internet-capable phones, as can be seen in the cells having 0% on Table 3.

Table 3
Students' ownership of personal computers and mobile phones in last three semesters

	Students who did not own computer	Students who owned computer	Students whose phones couldn't connect to the Internet	Students whose phones could connect to the Internet but could neither download nor upload files	Students whose phones could connect to the Internet and could download and upload Files	Students whose phones could connect to the Internet and could download but couldn't upload files
Semester 2, Year 1	36%	64%	3%	27%	46%	27%
Semester 1, Year 2	29%	71%	0%	20%	55%	25%
Semester 2, Year 2	25%	75%	0%	16%	64%	20%

Similarly, (also on Table 3) in first and second semesters of second year, there were increases in numbers of students whose phones were Internet-capable and could download and upload files. These increases equated to a decrease in the number of students whose phones could neither download nor upload files or could download but could not upload files in each of the semesters in the second year. In the second semester of Year 1, 2% of the students who did not own a computer acquired a computer, decreasing the number to 36% from the 38% it was in first semester of Year 1. This increase in students' voluntary ownership of laptop computers continued in the second year until only 25% of the students had no computer as at the conclusion of the project. This is a good indication of most students' willingness to learn with technology in the face of inadequate infrastructure, absence of institutional policy, low economic status, and some other factors that slow uptake of technology to education.

Can Students Use Facebook more for Academic Activities than For Activities Unrelated to Course Work?

One outstanding discovery made in this study is that 86% of the students were happy for their use of Facebook in learning. Seventy percent (70%) were able to spend for course-related activities through Facebook 80% of the time they used to spend on Facebook. Sixteen percent (16%) dedicated between 40% and 80% of such time to learning with Facebook. These 86% of the students developed more positive attitude to their academic work than the 9% who were yet to decide on how far they would want to learn with Facebook and 5% who were just uninterested. All these were exemplified in how students who had no Wi-fi-enabled computers and those whose mobile phones could not download and/or upload files (as on Table 2) voluntarily adopted alternative measures to go online (Figure 1) and acquired suitable devices during the project (Table 3). Students (14%) who were unhappy using Facebook to learn gave reasons for their unhappiness (Table 4).

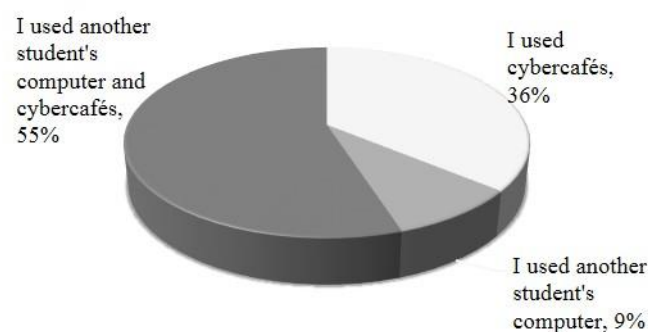


Figure 1. Measures voluntarily adopted by students who had no computers and their mobile phones could neither download nor upload files

Table 4

Reasons given by 14% of the students for being unhappy with use of Facebook in learning

Reason for being unhappy with use of Facebook in learning	Percentage of the unhappy students, who gave the reason
It's stressful	20.1
It imposes additional cost on me	19.5
It's stressful and imposes additional cost	20.4
It's a waste of time	40.0

Noted also was that students and lecturers participated in class work when they were away from campus. "I am excited that Facebook can help me to solve the problem of my often inevitable absence from face-to-face lectures," said a student of Health and Physical Education. A History and International Studies professor who travels a lot commented, with a sense of satisfaction:

While I was in the UK for six months, I could still engage my undergraduate and postgraduate students. I scheduled class meetings with them on Facebook and we discussed topics, critiqued books, asked and answered questions, in real-time. Some other times I posted assignments that they responded to at their own times within a deadline. The students enjoyed all that. It's really awesome, something I think every lecturer should adopt. I noticed that the students no longer give so much time to those other social media things that take their attention away from their studies. I strongly think I'll continue to use the platform in my teaching.

The professor had, indeed, put that thought into action.

Because lecturers' use of Facebook for teaching helped them to work with students, from anywhere, at any time of the 24-hour day and on any day of the seven-day week, their missing face-to-face lectures (to be in administrative meetings, to travel for conferences, et cetera and to do other engagements) no longer meant lost academic time. Thus, there was **a significant reduction in the time usually lost to travels and non-academic engagements** by both students and lecturers. These results and some other findings recorded below show that students can use Facebook more for academic activities than for activities unrelated to course work.

Learning Activities Which Students Engaged In

Students engaged in the following learning activities:

1. Collaborative search of the Internet for course-related resources whose Web links the students shared through Facebook;
2. Initiating and leading or participating in synchronous and/or asynchronous course-related chat or discussions on Facebook;
3. Communicating, at distances, social and academic messages with lecturer and class members;
4. Producing and sharing digital still and motion pictures to communicate emotions and educational insights and show creativity.

All the above support the fact (asserted by Bransford et al., 2000) that there must be opportunities for students to learn with understanding so as to develop competence, since factual information can only transform into usable knowledge when subject matter is deeply understood. Kirkwood and Price (2014) also stated acceptably that if qualitative changes in student learning were expected, then the associated activities must give them the opportunity to develop and practice appropriately.

How did the Lecturers Engage the Students on Facebook When Being Absent in the Physical Classroom was Inevitable?

Judging from their instructional activities on Facebook, lecturers used the social medium as a sort of learning management system (LMS). They created Facebook groups for their classes. They gave assignments through the groups—including ones that required working in small groups for which students created ancillary Facebook groups. Students uploaded completed assignments to their classes Facebook groups, making a student's work available not only to the lecturer but also to the other students. This brought about self-assessment, cross-breeding of ideas, and peer teaching, meaning that Facebook lends itself well to what education experts call collaborative or cooperative learning and to Schwab's "Community of Learners" concept (Schwab, 1976).

To the classes' Facebook groups, lecturers also uploaded course textbooks, lecture notes and reading lists. They as well posted Web links to online publications, videos and podcasts they wanted their students to work with. Groups with twenty-five members or fewer sometimes held synchronous discussions, using Facebook Messenger™, on a lecture note or another author's book/article. Lecturers and students additionally posted announcements related to change of meeting time/venue, checking information on a Website or on physical notice-board or somewhere else, date of examination or test, reminder of deadline for submitting completed assignments. They also posted announcements of birth, death and marriage

involving class members. Academic advising and mentoring were other tasks lecturers did through Facebook.

How did Students and Lecturers Cope with Economic and Infrastructural Challenges Associated with use of the Internet?

During participants' training which was the starting phase of the project, steady power supply was maintained by covering frequent public power outages with a hired standby electricity generator, which guaranteed Internet connection throughout the sessions. The unreliability of public power supply was also customary during the technology application phase. Measures fruitfully adopted against the challenge were: 1) lecturers' use of their private electricity generators more frequently than usual in their homes; 2) use of commercial cybercafés by students and lecturers sometimes, as the cybercafés rely on standby electricity generators. The measures involved costs, which all the lecturers and a majority of the students happily bore, in their curiosity for the outcomes of what they believed was an interesting novelty.

Another infrastructural challenge was the campus wireless network whose connection "comes and goes," according to a student, "and there are days I can't connect at all." "At times, the connection is so slow that a Website takes what seems like ages to open. It's frustrating," complained another student. Whenever the network was not accessible or connecting to it was that frustrating, 52% of the 1,252 students who owned computers went online through commercial cybercafés, 34% used either mobile phone data connectivity or a universal serial bus (USB) HSDPA modem they would plug into their computers, or both, and 14% did not use any alternative.

All the students who used alternatives to campus network or to their lack of suitable computer and mobile phone cut down their spending on drinks, snacks, clothing and miscellaneous personal items in order to afford the costs of those alternatives. This is a good step toward acquiring prioritization skill and making judicious use of money. In low-income countries, these skills are in high demand.

More Outcomes

The instructional and learning activities that lecturers and students engaged in resulted in increased participation in class discussions, increased student-student collaboration, improved student-lecturer communication, and more understanding of subjects. They again resulted in students' acquisition of critical technology skills (word processing, searching the Internet, digital audio/video recording, etc.) and non-technology (soft) skills (problem-solving, critical thinking, organizational, etc.). Furthermore, students became wiser in their use of money and, together with the lecturers, friendlier to the environment. All these and more are discussed in the paragraphs that follow.

Apart from collaboration and improved student-lecturer and student-student communication, these outcomes have scantily been noted by earlier investigators. Even with regard to student-lecturer communication, this project found additionally that **students submitted completed assignments more promptly than they did offline, their customary problem of physically going to a lecturer's office and not meeting them was solved, and lecturers gave one-to-one attention to students as they never had done.** A 100-level student of Electronic Engineering gave a clue to how these happened.

Before this project, it was very hard to see this lecturer after lecture hours. He is not always in his office. Through this use of Facebook with him, he is now available 2, 4, and can take and answer personal questions. I'm happy for this (said the student).

“2, 4” in the quotation above is a youth’s slang meaning twenty-four hours of the day. A text-response sent by a 300-level student of Linguistics during an interview with Facebook Messenger™ goes thus: “It [use of Facebook for one of her Linguistics courses] saves d stress of visiting [the lecturer’s] office as he is not alwz around.” In this text-response, “d” stands for “the”, and “alwz” stands for “always”. Truly, because of difficulty in their accessing some lecturers in person, students may be unable to hand in completed assignments within the time-frame if the process is offline.

Increased Participation

As Figure 2 illustrates, close to three-quarters of the students participated in class discussions more than they did prior to the project. Two factors resulted in this. Firstly, students who were usually passive in class discussions owing to speech disorder (like stammering), absent-mindedness, and shyness (because the students do not want to be ridiculed for errors or wrong answers) became active. These students sent opinions or questions as text messages to discussions moved to Facebook, without fear of faces or of being ridiculed. Secondly, asynchronous Facebook discussion allowed reflection on topics and expressing one’s understanding or questions at one’s own time. These show that online class discussion activity stimulates engagement, can deepen discussions, and agrees to the finding by Pilotti et al. (2017) that there is a relationship between asynchronous online class and cognitive engagement and depth of discussions.

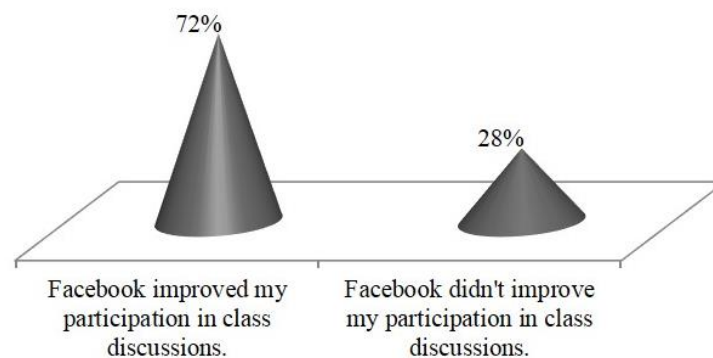


Figure 2. Facebook’s impact on students’ participation in class discussions

The students whose participation was not affected were chiefly the very active members of the class. They did not see any difference between an online discussion and an offline one, except that their online discussions on Facebook were by text, while offline discussions were oral.

Increased Academic Collaboration and Communication

It is not arguable that without ICTs, students collaborate and communicate in their studies. Figure 3 and Figure 4, however, show that it is unlikely that students can collaborate and communicate more without Facebook than with it. For example, in the first semester of the project (Semester 1, Year 1) 14% of the students indicated they were not collaborating before, but by the end of the project (Semester 2, Year 2) they had all started collaborating (which is what the 0% at the top of the Figure 3 represents). The number of students (n) that can collaborate or communicate face-to-face is most likely always less than the number that can collaborate or communicate on Facebook. This is because Facebook extends contact time (t) and number of students (n) that can be in contact. Students collaborate or communicate without ICTs only when they meet face-to-face, but with Facebook they continue the activity when they disperse even to very distant places (for example, when they are on vacation).

$$t_{\text{Facebook}} > t_{\text{face-to-face}}$$

$$n_{\text{Facebook}} > n_{\text{face-to-face}}$$

Another interesting occurrence is that no student collaborated more earlier than they did at their present time (0% in Semester 1, Year 1 and 0% in Semester 2, Year 2). This indicates that the more Facebook was used as educational technology, the more collaborative learning the students did, proved by the tall bars on Figure 3 (62% in more collaboration in Year 1 but 92% more collaboration in Year 2).

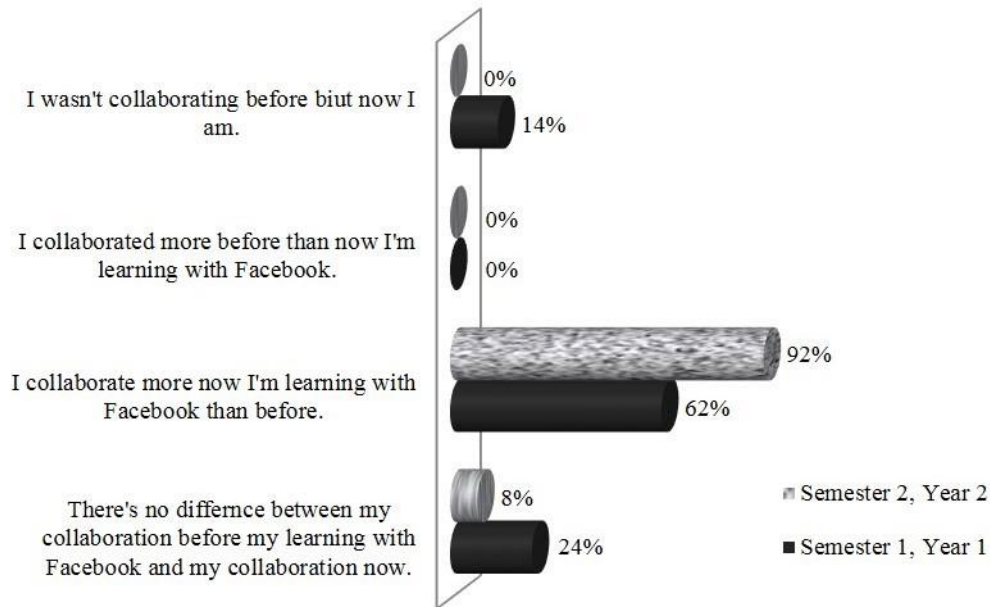


Figure 3. How Facebook affected students' collaboration in learning

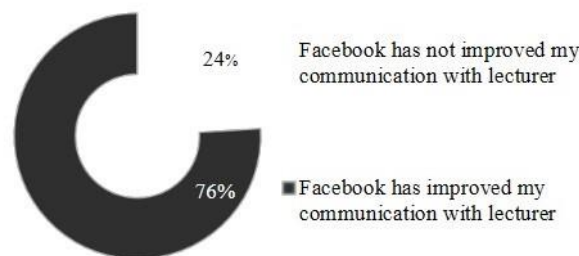


Figure 4. Facebook's impact on lecturer-student communication

Increased Understanding of Course Topics

One of the structured evaluation questions given to students in the fourth (final) semester of the project was: "Has the integration of Facebook into your studies contributed to your understanding of course topics better?" Over one-half of the students responded in the affirmative (Figure 5). This impact must have resulted from the new learning activities (as listed earlier on this paper) the students engaged in. The activities must have ultimately led the affected students to the path of independent inquiry and consequent better understanding of course topics and helped them to develop the non-technology skills and abilities on Table 5. All these align with education theories and work out competence in the students, agreeing also with Bransford, Brown & Cocking (2000) who argued that there must be opportunities for students to learn with understanding so as to develop competence, since factual information could only transform into usable knowledge when subject matter was deeply understood. The students (41%) who saw no improvement in their levels of understanding and

those other few (3%) who did not know whether or not the technology helped their understanding may need longer time of educational use of the technology.

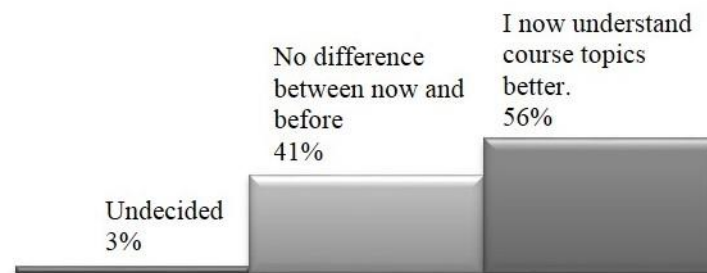


Figure 5. Students' reactions as to whether use of Facebook in learning had helped them in understanding course topics

Acquisition of 21st Century Skills

On Table 5, it can be seen that students acquired numerous technology and non-technology skills relevant to living productively in the 21st century and beyond. The acquisition progressed as semesters advanced. This shows that as Facebook was being used for courses, students grew in skills. From the way the students answered evaluation questions, they had not most of those skills and abilities prior to learning with Facebook, and the technology improved the skills and abilities they got earlier. No wonder Sendall et al. (2008) asserted that skills in the use of social media were generally essential in university education.

Table 5.

Skills acquired by students through learning with Facebook

Skills acquired by the students through learning with Facebook	By end of Semester 2, Year 1 of project		By end of Semester 2, Year 2 of project	
	Number of students who acquired	% of total number of students	Number of students who acquired	% of total number of students
- Word-processing	1,601	79	1,817	90
- Searching the Internet	1,454	72	2,019	100
- Downloading from and uploading to the Internet	1,393	69	2,019	100
- Setting up and using mobile phone to connect to and browse the Internet	1,253	62	1,353	67
- Collaboration skill	1,252	62	1,857	92
- Problem-solving skill (I can now solve many of my academic and other problems without depending on anybody.)	1,191	59	1,575	78
- Communication skill	969	48	1,796	89
- Initiative (I can now initiate a discussion and/or an activity/event.)	909	45	1,837	91
- Thinking critically about topics and ideas	835	41	1,758	87
- Relationship skill (I can now easily open and maintain relationship with people.)	835	41	1,900	94
- Organisational skill (I can now organise learning or discussion groups and events.)	767	38	1,778	88
- Video/audio recording with digital camera and/or mobile phone	424	21	1,778	88
- Still photography using digital camera and/or mobile phone	424	21	1,958	97
- Use of MS Excel or other spreadsheet	283	14	284	14
- None	69	3	0	0

The 3% of students (on Table 5) who did not acquire any skill in Year 1 but did in Year 2 and the increased number of students for most skills in Year 2 mean that technologies may not impact on one student at the time it impacts on another student. This suggests that continuous use of technology in teaching and learning is necessary for all students in a class to experience the same improved learning outcomes. Students then need to be consistently encouraged and motivated in word and deed to persevere in their use of technologies for learning.

Financial Prudence and Savings by Students

This project also revealed that students' expense in printing and packaging their reports of assignments reduced significantly. The 300-level Linguistics student who was quoted earlier added that the use of Facebook for one of her courses "has really helped a lot...it saves d stress of printing out works." With the word "stress", she means both the cost of printing and the time for going to and from where the printing is done. Students in the university spend about 2.56 United States Dollars (USD) to print a twenty-page word-processed report of an assignment. Only 0.75 USD (75 cents) is spent to upload such a report and more files to Facebook through a commercial cybercafé or a mobile phone or data modem. Through the campus WLAN, a student spends only 0.18 USD (18 cents) to upload to the Internet as many files as they want in 24 hours. This reduced-spending means much in Africa and other low-income parts of the world where many students find funding their education a bit difficult.

More Environment-friendly Students and Lecturers

Printed or handwritten works by students had always constituted large heaps of refuse for lecturers, and often they had not been properly disposed of. Papers were not involved when lecturers gave assignments to students and received responses through the online platform. This left a positive impact on the environment. The impact will be more visible when more lecturers and students adopt Facebook and/or other online platforms for teaching and learning.

Impact Time Varies from One Student to Another

From the data presented with Figures 2, 3, 4 and 5 and Tables 2, 3 and 5 and from the discussion so far, it can be generally said that use of Facebook as an educational technology may not impact on one student at the time it impacts on another student. Again, when students are positively affected at defined times, the levels of effect vary. What do these communicate? The message is that the longer technology is applied to education, the better the outcomes.

Privacy Issues

Some lecturers (6%) raised concerns about their privacy regarding being Facebook friends of their students. They complained that students they would not ordinarily want to know some of their (lecturers') personal information knew them, and unwanted messages about every action the students took on Facebook (including annoying tagging to photo) often lined up in their e-mail boxes.

Losses

Apart from internal loss of privacy by a few lecturers, no significant disadvantage arose from this use of Facebook for academic activities. How to effectively carry along the few students who expressed unhappiness remains a challenge, however. This is because since the other students (in majority) made sacrifices to scale through economic and infrastructural challenges, which indicates a strong positive attitude not only to technology in education but also to learning, could it be that the unhappy students have poor attitude to learning? This question is more critical when one considers the reasons on Table 4 alongside the truth that the same students freely spend much time and money on things not related to their studies

(including the normal non-academic use of social media) as is evident on higher education campuses.

Conclusion

With teachers and students' commitment to using alternative Internet connection when institutional WLAN went down, to making several other sacrifices, and to using Facebook's features beyond what they were originally intended (unlike what earlier experimenters did), this use of Facebook as an educational technology yielded a number of surprising positive outcomes. Some important lessons also emerged. These include:

- Students happily reallocated 40 - 80% of the time they spent on Facebook for pleasure to academic activities on Facebook.
- A majority of students experienced increased understanding of course topics, more collaboration, increased participation in class discussions, and increased communication with and access to lecturers.
- Lecturers and students regained the time and learning activities they usually lost when absent in face-to-face class meetings.
- Most students acquired many skills essential for employment and living in the 21st century and beyond.
- Seeking new ways of teaching and learning or of using available technologies can yield positive results beyond expectation;
- Technologies which will enhance learning in one institution are not necessarily those successfully used in another institution, and they do not have to be standard learning technologies, such as LMS;
- Involving lecturers and students in adoption and planning is profitable;
- Sensitization and training are very important, and training should be hands-on, as Olbinger and Olbinger (2005) rightly observed that although teachers and students were comfortable using technology, their understanding of the technology or source quality might be shallow;
- Internet connectivity, power supply and availability of and access to technologies are fundamental, and so there should be a framework and policy for institutional provision and use of technologies to support teaching and learning. One way to do this is to have a very reliable WLAN and departmental Internet laboratories or an acquisition programme that enables students to own Wi-fi laptop computers.

There is the need for sustained use of the technology and of inclusion of other very interesting academic activities in order for every student to happily participate and experience a positive impact. Regarding concerns about privacy, lecturers and students should be frugal about personal information to supply in their Facebook accounts and be cautious about what they post and about turning on "Location" on their mobile devices. They should additionally use Facebook's Settings optimally to control what people can read about them and the kind of notifications they do not like to receive.

Further Recommendations

What was done in this project should be replicated and scaled up in HEIs and high schools anywhere, especially in developing and least-developed countries, as such effective use of Facebook in teaching and learning may be the only e-learning experience most students and teachers in resource-poor areas may get. Because examination grades are still a major measure of students learning, although most educators globally hold that they had not really been very reliable learning indicators, further investigation on the academic use of Facebook (as of any other technology) should focus on its impact on a student's grades.

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