A Correlational study of Postgraduate Students' Engagement in Asynchronous Online Discussion (AOD) for Collaborative Learning In a Nigerian University Faculty of Public Health

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Abstract

Advances in telecommunications and educational technology tools and applications are making positive impact through improved accessibility to information sharing in both academic and non-academic environments. With the increase in susceptibility of people of all ages to serious public health hazards such as the spread of Ebola virus; Sharing of health education tips, advice and counselling using the electronics platforms of social media could have become inevitable. This study correlates postgraduate students' Asynchronous Online Discussion (AOD) which is a form of social media interaction at an interval of two academic sessions at the Faculty of Public Health, College of Medicine University of Ibadan, Nigeria. The survey research study used ex-post facto approach through assessment of participants' engagement in threaded discussions on Yahoo group e-mail communications. A duly validated instrument (r=0.85) was used to collect data from a total of sixty-eight students. Findings from the study revealed that participation has a positive high significant relationship with collaborative learning. This result implies that predictor variables of; students' computer skills, accessibility, use, perception, participation and barrier to participation in asynchronous online discussion are important in predicting postgraduate students' involvement in collaborative learning, while barrier to participation in asynchronous online discussion strongly contribute negatively to their engagement in AOD. The study recommends university teachers should vary their use of lecture method through application of new educational technologies of collaborative learning approach to supplement face-to-face teaching so as to encourage cross fertilization of idea among the students.

Key Words: *Educational Technology Asynchronous Online Discussion, Collaborative Learning, e-mail communication, Social Media.*

Introduction

Advances in telecommunications and media technologies with multifarious networked tools and applications are making a positive impact in both academic and non-academic environments. There is increased access to and sharing of information within and among people of all ages across borders and breaking racial barriers. The global system for mobile telecommunication (GSM) was introduced in Nigeria through the issuance of operating licenses to three pioneer telecommunication service providers in 2001 by the Nigerian

Communications Commission (NCC), which is the sole regulatory agency for the telecommunication industry (NCC, 2001). Mobile technology devices are equally designed with ease of operation and have become tools for disseminating information among young and old, literate and semi-illiterates. Mellar (2007) postulated that mobile technology devices like tablets, personal digital assistants (PDAs), mobile and smart phones and iPods are particularly motivating for news, entertainment, and enable greater flexibility in teaching, with teachers taking advantage of the mobility of the technology to move outside the classroom.

Moreover, the use of mobile technology could be profitable for academic purposes through application and integration in higher education, so as to enhance effective communication between lecturers and students within and outside the four walls of the classroom (Otunla, and Akinyemi, 2014). Mobile technologies are capable of impacting on the implementation and curriculum delivery in higher education especially in the form of collaborative learning as well as blended learning delivery systems. The current global public health quagmire of the spread of Ebola virus is presently ravaging some countries in Africa and indeed the entire world with no clear cut solution in as at now. Hence, attention should be shifted by medical and health training institutions in Nigeria and indeed in Africa at large; to training of public health service providers who are sound in the use of modern media technology. Expectedly, such healthcare service providers should be able to reach out to the people of all ages in the society through promotion of healthy living and health education via online and mobile health advocacy programmes. Sharing of health education and information through health tips, advice and counselling via the use of electronics platforms of social media and online forums could be a way out of instilling basic health alertness into the health system of our citizens.

Online communication and social media platforms such as *e-mail*, *Facebook*, *Twitter*, *WhatsApp*, *2Go*, e.t.c., among other Internet tools and resources could be utilized for instructional purposes and serve as educational technology media formats for effective teaching and learning delivery. Current research attest to the fact that online discussions is becoming widely accepted by teaching faculty at the University of Central Florida as a form of routine requirement for class discussion participation (Lynch, Kearsley and Thompson, 2011). Most students find the online environment more convenient, attractive and conducive for learning because of the opportunity to access resources anytime from anywhere (Moskal, Dziuban and Hartman, 2010; Allen and Seaman, 2013). Starkey (2006) opined that levels of

social presence have been linked to the overall student satisfaction and perceived learning which have a positive effect on the quantity and frequency of participation.

Collaborative or cooperative learning forms the theoretical framework for this study. The term collaborative learning implies "working in a group of two or more to achieve a common goal, while co-operative learning means working in a group of two or more to help each other achieve an individual goal," (McInnerney and Robert, 2004). It is premised that, asynchronous online discussion (AOD) is a form of collaborative or co-operative learning whereby learners or participants relate together using the electronic platform to communicate, consult and contribute at their own conveniences. Some studies have shown that learning through collaboration, as compared to competitive or individual learning, usually results in higher achievement, better psychological connections (caring, support, and commitment), greater psychological health, social competence, and self-esteem (Johnson and Johnson, 2004, Zydney, deNoyelles and Seo, 2012).

The advent of the Internet and tele-communication technologies, has led to many attempts to incorporate collaborative learning methods in online environments. Some studies reported that incorporating well-planned collaborative activities could impact the learning process by improving socialization skills, as well as enhancing critical thinking (Jegede, 2002) and that integrating online learning in higher education leads to improvement in higher order thinking skills (Schultz, 2003) and effectively promoting social interactions among learners (Bassani, 2011; Molseed, 2011).

Hiltz and Turoff (2002) proposed some collaborative learning activities, which are regarded as applicable in online or virtual environments; these strategies include; debates, group projects, case study discussions, simulations, role-playing exercises, the sharing of solutions for homework problems, and the collaborative composition of essays, stories, and research plans. But in reality, most online collaborative learning is usually relegated to discussion or conversations; in which students merely generate a dialogue with their peers. Kreijns, Kirschner, and Jochems (2003) however, cautioned that simply assigning students into a group and asking them to work collaboratively may not guarantee the desired intention of the moderator in this case the teacher.

Hron and Friedrich (2003) observed that although online learning environments equipped with communicative technologies could improve upon asynchronous and online collaboration; computer-mediated communications puts other demands on participants. Some of these demands include; possession of some identifiable skills in computer literacies and

technology competencies; keyboarding, word processing, and text formatting/editing skills using conventional software applications. These skills are to ensure active participation of members in the asynchronous online discussion group (Hron and Friedrich, 2003). van Tyron and Bishop (2009) also observed that online participants may feel disconnected from co-participants in computer-mediated communication environments or during AOD forum which can hinder participants from interacting and collaborating with others.

Hron and Friedrich (2003) further opine that even highly motivated participants can be frustrated when they do not get timely feedback from group members. In addition, the accumulated messages on the discussion forum might become overwhelming for some or majority of the participants to digest and actions or activities of individual are not easily visible to others in online environments unlike in face-to-face environments. Consequent upon all these, some authors have become more critical on some views expressed by researchers on the issue of employing online or new media strategies in teaching and learning. Dirkx and Smith (2004) for instance found that students are often reluctant, frustrated, and dissatisfied with online collaborative learning methods, especially when working within small online groups, because they "struggle with the development of a sense of interdependence and inter-subjectivity within their online groups, and end up holding onto subjective, individualistic conceptions of learning". The authors asserted further that such experiences could worsen in online environments due to the difficulty in providing the emotional dynamics, which are often cited as being a critical element of the collaborative learning process.

To eliminate some of these challenges, Johnson and Johnson (2004) specified five basic elements that are important for effective group collaboration: (a) positive interdependence, (b) promoting interaction, (c) individual accountability, (d) appropriate use of social skills, and (e) group processing. Johnson and Johnson (2004) while making further explanations posited that positive interdependence is the heart of effective collaboration which transpires when each member in a group perceives the group dynamism as strength rather individual efforts. Promoting interaction is also a drive for effective collaboration because the group act as trustworthy members by acknowledging, challenging and facilitating each other's ideas and efforts thereby, interact freely with each other.

Furthermore, individual accountability must be ensured among the group members through active participation in the group collaborative assignment; accountability can be achieved when the performance of each group member is assessed. Another key element for effective collaborative learning approach is the development of cogent social skills that will ensure trust building, clear communication, and constructive conflict resolution within the group and lastly; group processing provide guideline for monitoring of group member's participation and contributions to the entire quality of the work through social interaction for effective group collaboration (Johnson and Johnson, 2004).

Similarly, An and Kim (2007) in their study examined collaborative learning in virtual environments through teachers' self-reported benefits while participating in an online group project similar to AOD and the authors found that the three primary benefits perceived as valuable by participant included the following; a) the development of their metacognitive knowledge, b) their recognition of the value of a supportive learning community; and c) their new understanding of the constructive use of online communication tools.

Further, An, Kim and Kim (2008) conducted a case study on twenty-four students (16 female and 8 male) who volunteered to enrol for an instructional technology course during the summer semester of 2005 at an online graduate school of education located in the South-Western U.S. The majority of the participants were in-service teachers with age ranged from 29-56 years old. Participants were randomly formed in groups of three to four students and each group was provided with a group discussion board situated in the Blackboard Learning System with minimal intervention in the group processes. Participants were also allowed to use other types of communication methods, such as the phone or email, but most students reported that they primarily used the BlackBoard discussion board. Assessment during the period of 4-week group project was based on the group's work, rather than the efforts of any particular individual.

An, Kim, & Kim (2008) from their conclusions identified some factors that contributed to successful online group projects which include: (1) individual accountability, (2) affective team support, (3) presence of a positive leader, (4) consensus building skills, and (5) clear instructions. The authors further posited seven impeding factors or barrier to successful participation among the in-service teachers which are: (1) lack of individual accountability, (2) challenges inherent to virtual communication relying solely on written language, (3)

technology problems, (4) unclear instructional guidelines, (5) different time zones, (6) lack of a positive leader, and (7) lack of consensus building skills.

Statement of the Problem

Even though there is no clear-cut nationally adopted policy statement regarding technology-based learning in Nigeria higher education system as of now, there are isolated reports on technology use among Nigerian institutions of higher learning. Technology use in the classroom through integration of Internet-based learning resources alongside conventional approaches is becoming a common practice in some Nigerian universities. Furthermore, competency in computer and ICT skills have become a major component embedded into graduate recruitment exercises for employment and procedures for job placement into some Nigerian and multi-national corporations. In the contrary, most Nigerian postgraduate students who are presently pursuing various programmes within the country are not actively engaging in computer-related hands-on activities that could strategically place them at pal with their contemporaries because the course design does not require such ICT skills. This study therefore, correlated postgraduate students' engagement in asynchronous online discussion (AOD) via e-mail communications for two academic sessions in relation to collaborative learning skills. The main objectives are; to actively engage postgraduate students and to correlate their engagement in relation to collaborative learning skills using AOD forum.

Purpose of the Study

The purpose of the study was to:

- actively engage participants in asynchronous online discussion as supplementary to face-to-face teaching and learning with a few to instil and induce collaborative learning skills in the students.
- correlate postgraduate students' engagement in asynchronous online discussion (AOD) for two academic sessions as predictor of collaborative learning.

Research Questions

The following are the research questions:

1. Is there any existing statistically significant relationship among the predictor variables (Graduate students' computer skills, accessibility, use, perception,

participation and barrier to participation in asynchronous online discussion) and the criterion variable (collaborative learning)?

2. Does the obtained regression resulting from a set of three predictors (Graduate students' computer skills, accessibility, use, perception, participation and barrier to participation in asynchronous online discussion) allow reliable prediction of collaborative learning?
3. Which of the predictor variable is most statistically influential in predicting collaborative learning?
4. Are there any predictor variables that do not contribute significantly to the predictor model for collaborative learning?

Methodology

Research design

The study employs survey design using Ex post facto approach. Data were gathered on participants' involvement in asynchronous online discussion forum which was created on Yahoo group blog.

Population and sample of the study

Purposive sampling technique was used with intact classes among Masters in Public Health (MPH) in the Department of Health Promotion and Education, Faculty of Public Health, University of Ibadan, Nigeria. The study involved a total of 68 postgraduate students with 33 participants during 2011/2012 academic session and 35 participants during 2012/2013. Postgraduate students' participation was on a voluntary basis since there was no university-wide ICT integration policy in the University of Ibadan as at the time of conducting this study. Participants' academic first degrees cut across applied sciences, medical and health science and social sciences. The participants constituted a networked community of postgraduate students in a low technology-driven institution. The AOD activities supplemented face-to-face classroom interaction.

Validity and Reliability of Instrument used for Data Collection

A duly validated questionnaire i.e. ICT skills and Online Discussion Assessment Survey (ICTSODAS) was used to gather data from participants. The instrument contained seven sections; demographic data, access to computers and Internet resources, level of competence in computer and ICT skills, use of computer for learning related activities,

perception about integrating online discussion into face-to-face interactions, impact of online discussion group on teaching/learning, barrier to active participation on the AOD and rate of participation on AOD. The instrument was subjected to reliability test, which yielded Cronbach alpha of r. =0.85. The instrument was used to collect data on computer skills, access to Internet resources, participation in, and barriers to participation in the asynchronous online discussion forum. Quantitative data were also gathered from group activities and postings using online discussion transcripts' tracking to ascertain and verify some claims made by participants using the self-reported assessment instrument. .

Procedure for Data Collection

Yahoo group was adopted as the platform for the AOD based on an initial investigation carried out among the targeted group. Participants were briefed on the importance of the exercise, group moderators were appointed for each session (2011/2012 and 2012/2013). The moderators created the group blog with the programme and course name / code acronyms e.g. https://groups.yahoo.com/group/hpe702avtec/ and https://groups.yahoo.com/neo/groups/mphstudentsgroupurl/ respectively. Thereafter, the moderators invited the class members through subscription to the group blog via participant's personal e-mail addresses. Membership and participation on the forum was restricted to only Health Promotion and Education-MPH Students who registered for the course HPE 702 - Audiovisual Media Technology in Health Education during 2011/2012 academic session and HPE 703 – Behavioural Change Communication: Theory and Concepts during 2012/2013.

The two MPH classes were fully involved in the AOD forum during the two sessions through the first author's online interactions with the postgraduate students. Participants in the study were engaged in threaded discussion forum for a period of at least twelve weeks (three months) during the first semesters of 2011/2012 and 2012/2013 academic sessions at the Faculty of Public Health, College of Medicine, University of Ibadan. The only instrument used i.e. ICT skills and Online Discussion Assessment Survey (ICTSODAS) was administered by the first author at the end of each semester course i.e. HPE 702 and HPE 703.

Method of Data Analysis

The data gathered were coded and analysed using descriptive statistics and multiple regression, correlational and quantitative analysis.

Results and Findings

Research Question One: Is there any existing statistically significant relationship among the predictor variables (Graduate students' computer skills, accessibility, use, perception, participation and barrier to participation in asynchronous online discussion) and the criterion variable (collaborative learning)?

Table 1: Correlation Matrix of Multiple Correlations among the Predictor Variables

Model	Variables	Professional Development	Skills	Access	Use	Perception	Participation	Barrier
Correlations	**Collaborative learning**	1.000						
	Skills	.236	1.000					
	Access	.217	.367	1.000				
	Use	.188	.407	.681	1.000			
	Perception	.438	.165	.207	.215	1.000		
	Participation	.910	.199	.175	.118	.224	1.000	
	Barrier	.283	.112	.057	.074	.143	.221	1.000

Table 1 presents the correlation matrix of postgraduate students' computer skills, access, use, perception, participation and barrier to participation in asynchronous online discussion and the criterion variable (collaborative learning). It is observed that participation has a positive high significant relationship with collaborative learning ($r = .910$; $P < .05$), the same is perception (.438; $P < .05$). In the same vein, use ($r = .681$; $P < .05$) have significant but positive relationship with access. This result implies that predictor variables (postgraduate students' computer skills, accessibility, use, perception, participation and barrier to participation in asynchronous online discussion) are important in predicting collaborative learning.

Research Question Two: Does the obtained regression resulting from a set of three predictors (Postgraduate students' computer skills, accessibility, use, perception, participation and barrier to participation in asynchronous online discussion) allow reliable prediction of collaborative learning?

Table 2: Model Summary

Model	R	R Square	Adjusted R Square	Standard Error of the Estimate
	.944[a]	.891	.880	.83270

Table 3: Analysis of Variance of the Multiple Regressions

Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	344.938	6	57.490		.000
Residual	42.297	61	.693	82.910	
Total	**387.235**	**67**			

The multiple regression correlation coefficient (R) showing the linear relationship between predictor variables (Postgraduate students' computer skills, accessibility, use, perception, participation and barrier to participation in asynchronous online discussion) on the collaborative learning as shown in Table 2 is 0.944, the multiple R^2 is 0.891 which is 94.4% and the Adjusted R square value is 0.880 which is 88%. This means that the variation in the postgraduate students' collaborative learning accounted for by the predictor variables is approximately 88% and it is statistically significant. Further indication in Table 3 is the Analysis of variance of the multiple regression data. This produced an F- ratio of f (6, 61) = 82.910 and found to be significant at 0.05 Alpha level. This result implies that postgraduate students' ICT skills, access to and use of Internet as well as participation and barrier to participation in AOD could significantly enhance collaborative learning.

Research Question Three: Which of the predictor variable is most statistically influential in predicting computer-mediated professional development?

Table 4: Regression Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig
	B	Standard Error	Beta		
Access	1.086	.659	.013	1.650	.104
Skill	.017	.061	-.012	.271	.787
Use	-.014	.067	.038	-.208	.836
Perception	.058	.092	.234	.631	.530
Participation	.423	.080	.839	5.259	.000
Barrier	1.083	.058	.060	18.628	.000

Table 4 shows the contribution of each of the independent variables to the prediction model. Two of the independent variables contributed significantly to the prediction model at 0.05 Apha level. These variable are Barrier to participation $\beta = .839$; $t(61) = 5.259$; $p < .05$) and Participation $\beta = .060$; $t(61) = 18.628$; $p < .05$). With the direction of findings indicating that barrier to participation in asynchronous online discussion strongly contribute to collaborative learning, it means that the barriers masked the indices of collaborative learning.

Research Question Four: Are there any predictor variables that do not contribute significantly to the predictor model for collaborative learning?

Table 4 also revealed that other independent variables do not contribute significantly to the prediction model for collaborative learning.

Discussion and Implication of the findings

The findings of the study indicated and imply that postgraduate students' active engagement in AOD could contribute increasingly to collaborative interactions and activities which pre-suppose to promote collaborative learning strategy and in the long run improve learning outcomes and effectively promote social interactions among participants. The finding partly agrees with the submission of Jegede (2002); Schultz (2003) on improved social skills and higher order thinking skill engagement and Bassani (2011) and Molseed (2011) on promotion of social interactions. The finding imply that students' involvement in

online activities such as AOD alongside their colleagues, teachers and other experts who are part of the online community would significantly increase their level of awareness in their profession and provide opportunities to contribute to global public health promotion and education. This finding is also in line with Ruhleder and Michael (2000); Starkey (2006) conclusions that online participation creates opportunities for peer-peer and student-teacher interactions.

Findings further revealed that barriers to participation in AOD strongly contribute to collaborative learning with the implication that the barriers masked the indices of collaborative learning, and it agrees with Hron and Friedrich (2003); Kreijns, Kirschner, and Jochems (2003); Dirkx and Smith (2004) submissions that states that participants in online learning are prone to experience initial frustrations due to some barriers. The finding also corroborates Tyron and Bishop (2009) submission that online participants may feel disconnected from co-participants in computer-mediated communication environments which may occur as result of any major barrier.

Finding implies that massive use of innovative pedagogy through digital media applications and tools of mobile learning has potentials to positively impact the 21st century classroom through appropriate and systematic integration into teaching and learning. Expectedly, University teachers that are involved in teaching various postgraduate courses at higher degree levels should become innovative. Such that they could effectively use new educational technologies like social networking media, mailing list, web conferencing forums and online communication tools alongside face-to-face interactions in their classroom interactions as postulated by Moskal, Dziuban and Hartman (2010); Lynch, Kearsley and Thompson (2011); Allen and Seaman (2013).

Conclusion

Findings of this study establishes the fact that electronic communications especially, e-mail communication, mailing list and social networking media and other forms of Internet tools such as blogs could be annexed for academic purposes and could be integrated into the classroom for enhancing teaching delivery. Collaboration skill which is one of the key 21st century skills could be developed among postgraduate students via the use of asynchronous online discussion (AOD) to sharing and deploy health promotion and education tips, advice and counseling with use the electronics platforms of social media among young and old people.

Conclusively, participation in asynchronous online discussion is a predictor of interest in collaborative learning as demonstrated in this two year correlational study. Thus, University teachers who are strategically positioned to impact students for the development of 21st century learning skills should improve on their teaching effectiveness through the use new and emerging educational technologies and innovations such as presented in the study.

Recommendations

Arising from the findings of the study, the following recommendations were made:

- University teachers should vary their use of lecture method through application of blended learning, cooperative learning or collaborative learning approaches as supplementary to face-to-face teaching to encourage cross fertilization of idea among the postgraduate students.
- Teachers and students should synergize by creating academic-based, multi campus and university-wide online collaborative learning blogs and forums to make learning a continuous experience outside the classroom.
- Active and increased participation in electronic communication platforms, blogs and social networking media through the use of mobile and online collaboration among university lecturers and postgraduate students even for e-mentoring opportunities.
- Lastly, Universities in Nigeria should come up with clear-cut University-wide Information Technology (IT) policy in form of formulation of new policy or adoption of existing ones that will spell out in clear terms modalities for integration of ICT tools and resources in higher education teaching and course delivery systems.

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