PRE-SERVICE TEACHERS ONLINE INTERACTION: ISSUES OF GENDER AND AREA OF SPECIALISATION

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Abstract
Interaction has continued to occupy strategic position in online teaching and learning at all levels of education. Unlike the conventional method of teaching where interaction is noticeably present among all elements in teaching-learning process, the physical contact between students and instructor in virtual learning environment is usually at the minimal level. Therefore, the level of interaction remains a viable parameter to determine the success or otherwise of any online instruction. However, several factors could hinder effective interaction between learners and instructor in an online learning environment. This study examined the influence of gender and area of specialization of pre-service teachers on their level of participation in online learning. The findings showed that gender had no influence on the extent of online interaction of pre-service teachers across all the departments. However, the area of specialization of pre-service teachers had significant influence of 0.02, which indicated that teaching subject areas could go a long way in determining the extent of interaction in virtual learning environment.

Introduction
The quality and quantity of interaction among students, instructors and materials constitutes a significant component of effective instruction in any educational programme whether online or traditional face-to-face setting. Online learning appeals to a large number of students because it offers flexibility, ease of access, and convenience in participation. Online learning, for reasons earlier stated, would continue to occupy a strategic position in our educational system, especially at the higher education level. Further justifications for the increasing acceptance of

this innovative learning platform are the population explosion in students' enrolment, and their maturity to engage in learning through effective interaction. The use of online instructional tools can, to a large extent, reduce instructional challenges associated with the conventional mode of delivering lectures because it provides a forum to address issues through argumentative and collaborative discourse (Karacapilidis and Papadias, 2001). For students, the online environment is less intimidating as it allows for multiple and collaborative participation and less bounded by convention (Redmon and Burger, 2004).

Many scholars have advocated for the need to integrate traditional classroom instruction with online learning in order to shift the focus of instruction from teacher-centered to student-centered approach. Balaji and Diganta (2010) assert that "while ICT tools had been widely used in distance education, online instruction is being increasingly used along with the face-to-face lectures to augment and support classroom learning. The use of online discussion forum has provided a veritable platform to effectively engage students outside the classroom."

However, due to pedagogical differences in face-to-face and online learning environments, especially the rate of physical contact between students and instructors, online interaction provides a parameter to determine the success or otherwise of online mode of teaching. In online teaching, instructors need to be able to interpret students' needs through nonverbal cues since verbal communication and physical contact are practically unavailable. Therefore, an effective means of accomplishing this is to critically observe changes in the level of a student's participation and interaction (Palloff and Pratt, 2003). It is against this background that Palloff and Pratt (2001), define interaction in online learning as the contact between students and instructors; collaboration and cooperation among students; and interaction between the students and course contents. They further reiterate that the social interaction in online courses is the hallmark of a successful online experience in which students' learning is constructed.

With the increasing growth of online learning especially in higher education across the globe, one strategic component that has been identified as an important factor affecting students' learning experiences in online learning environments is students' interaction

(Allen and Seaman, 2006). Interaction provides insight into how students construct knowledge in online environments (Hyo-Jeong, 2010). One of the most important determinants of the quality of student experiences and learning outcomes in an online programme is the quality of interactions between the students and instructor. Zhao, Lei, Lai and Tan (2005) argue that when instructor's involvement in online interaction is low, the expected outcomes are not as positive as in a face-to-face approach. However, when the instructor's interaction level is high, it can enhance the student's learning experience and learning outcomes. Understanding students' online interaction is important because interaction influences the quality of online learning (Trentin, 2000). Studies have shown that interactions among students in online environment could motivate them to be effectively engaged in teaching-learning process. Students are motivated to be a part of the interaction and to contribute to the online interaction because it helps them to work collaboratively with their peers and the instructor (Song and Hill, 2009).

Online interaction usually occurs through online discussion forum (ODF), e-mail communications, instructor's feedback, classmates' feedback and chart rooms. These online activities are considered as substitutes for traditional face-to-face interactions and could go a long way in creating a learning community where interaction occurs among the instructor, students, and the course content. Unlike the traditional classroom setting, online learning is virtually-programmed and there is a need to consistently ensure that students are given unhindered opportunities to seamlessly interact with their peers and tutors with a view to creating a balanced and productive online learning experience. As Thomas (2002) notes, the online discussion forum provides significant opportunities for students to actively engage in their learning process through active participation and collaboration.

In studying online learning success, Swan (2002) identifies that the student-instructor interaction and student-student interaction positively influence students' success. She further explains that discussion among students contributed to students' success and this reveals the importance of the quality of student-student interaction in online discussion. The fact that learners are required to participate in meaningful interactions engenders effective interpretation and construction of meaning and enables them to construct their own

learning using online platforms. All these are pointers to the fact that no meaningful online activity can take place without effective interaction among the instructor, students and course content/material. This study, therefore, examines the online interactions of pre-service teachers in educational technology course. The course was delivered through both traditional face-to-face and online modes. The study examines students' interaction in the online component of the course with a view to determining the level of students' interaction in the online environment.

Statement of the Problem

Online interaction provides a suitable parameter for educators to effectively measure the success or otherwise of the online learning mode at different levels of education. Whereas much research has been conducted on the interaction in traditional teaching and learning situation, there seems to be paucity of research on students' interaction in the online learning environment. Many scholars have advocated for the need to carry out more studies on the level and effectiveness of interaction on the online mode of instruction. There is also a need to interrogate the level of interaction among pre-service teachers because the responsibility of achieving the educational goals and objectives of the future rests on them. This study seeks to fill the identified gaps in literature and contribute to the body of knowledge in the area of students' interaction in an online environment. The research, therefore, examines online interaction of pre-service teachers in educational technology course at the Faculty of Education, University of Ibadan, Nigeria.

Research Questions

1. What is the extent of pre-service teachers' interaction during online learning activities?
2. Which of the groups has the highest level of interaction during online learning activities?
3. Which of the departments has the highest level of interaction during online learning activities?
4. Does gender have influence on the pre-service teachers level of interaction during online learning activities?

5. Does area of specialization have influence on the pre-service teachers level of interaction during online learning activities?

Theoretical Framework

Connectivist Learning Theory by Siemens, G. provides the framework for this study. Connectivist theory, according to Siemens, offers rational argument for how individuals learn and work in a networked environment of the digital age. In this environment, students do not have total control over what they learn since others in the network continually change information, and that requires new learning, unlearning old information, and/or learning current information. Some of the basic assumptions and guidelines of connectivism are summarised thus:

- As a result of the information explosion, learners should be allowed to explore and research current information. Learners of the future need to be autonomous and independent learners so that they can acquire current information to build a valid and accurate knowledge base. Appropriate use of the Internet is an ideal learning strategy in a networked world.
- Some information and procedures become obsolete because of changes in the field and innovation. Therefore, learners must be able to unlearn old information and mental models and learn current information and mental models. The information that is valid today may not be valid tomorrow.
- The rapid increase of information available from a variety of sources means that some information is not as important or genuine as other information. As a result, the learner must be able to identify important information from unimportant ones. Learners must have the ability to recognize what knowledge is no longer valid so they can acquire the new knowledge for a discipline. This requires that learners keep up-to-date in the field and be active participants in the network of learning.
- Given the phenomenon of globalization, information is not location-specific. Consequently, with the increasing use of telecommunication, experts in technologies and learners from around the world can share and review information. Learning and knowledge rest in a diversity of opinions. As a result, learners must be allowed to connect with others around the

world to examine others' opinions and to share their thinking with the world

- Due to the information explosion, learners of the future must be willing to acquire new knowledge on an ongoing basis. Online teaching strategies must give learners the opportunity to research and locate new information in a discipline so that they can be abreast of developments in their field. The Internet is expanding education into a global classroom, with learners, teachers, and experts from around the world. As a result, learners must network with other students and experts to make sure that they are continually learning and updating their knowledge.
- Innovation and increasing use of technology have transformed learning into a more multidisciplinary academic enterprise. Learners must be exposed to different fields so that they can see the connections between the information in the fields. For example, learning about learning theories requires that learners be exposed to what the research says in psychology and information technology.

Siemens (2004) suggests that because of the networked society, globalization, and the constant changes to information and new information, educators need to look at new ways to design learning materials. He proposes a theory based on connectivism to prepare learners to function in the digital and networked age.

From the aforementioned guidelines, it would be observed that the central focus of connectivist learning theory is interaction among the instructor, students and the course content. Online instruction provides a suitable platform for effective interaction among these elements, especially, in the sharing of ideas and exchange of information. The theory emphasizes the need to allow learners interact with others and sharing their thinking with the rest of the class. This happens to be the strategic focus of this research as students were virtually given the opportunities to interact and share their opinions with their peers and tutors on different topical issues relating to the course.

Methodology

Research Design

This research adopted the survey research design to examine the online interactions of pre-service teachers in educational technology course.

Study Population and Sampling Technique

The population for the study comprised all pre-service teachers from the Faculty of Education, University of Ibadan from where 332 students who offered the course were purposively selected as participants in the research.

Research Instrument

Data source for the study was a ten-item questionnaire designed to specifically measure the level of online interaction of pre-service teachers in educational technology course.

Procedure

Introduction to Instructional Technology is a compulsory course for all 300 level students in the departments of Teacher Education, Guidance and Counseling, Human Kinetics Education, Adult Education and Special Education in the Faculty of Education, University of Ibadan, Nigeria. During the classes, students were grouped according to their departments in order to analyse some issues that were posted online. Students were allowed access to some contents of the lesson using different online platforms such as twiducate and Sophia. Thereafter, they were encouraged to interact online and share their opinions with their peers and tutors on different concepts related to the course. Students, therefore, came to class with different ideas and were allowed to share their opinions in the general class. At the end of the course, the questionnaire was administered to examine the level of online interaction among the students.

Results

Research Question One: What is the extent of pre-service teachers' interaction during online learning activities?

Table 1: Pre-Service Teachers' Interaction during Online Learning activities

S/N	ITEMS	N	MEAN
1	I prefer interacting with my classmates on the online platform (Sophia/Twiducate) than in the classroom.	332	2.9910
2	I am actively involved in classroom discussions than interacting in online platforms.	332	2.4819
3	Online discussion/learning is better because I can do it anywhere I am.	332	2.8614
4	I express myself better on the online platform than during classroom discussion.	332	2.6566
5	I prefer answering questions on the online platform than during classroom discussion.	332	2.9066
6	It is difficult to participate in the discussion on the online platform than during classroom discussion.	332	2.8373
7	Poor internet connection has made interaction online quite challenging.	332	2.8614
8	The classroom is always rowdy during classroom discussion, so, I prefer online discussion.	332	2.8825
9	I am shy to express myself on the online platform.	332	2.9367

The weighted average is 2.82
The result showed that students' interaction during the online learning activities was well above average. This implies that pre-service teachers acknowledge the affordances provided by the online learning mode and are willing to participate in effective online interaction.

Research Question Two: Which of the groups has the highest level of interaction during online learning activities?

Table 2: Level of Interaction among Groups during Online Learning Activities

Groups	N	MEAN	Between Groups	Within Groups	Df	Mean Square	F	Sig.
Games and Puzzle	77	21.9221	500.959	9839.357	4	125.240	4.124	.003

Social Media	66	21.0909						
Mobile Learning	58	24.3966			324	30.368		
UGC	55	22.9091						
Digital Story	73	23.9726						

The result reveals that all the five groups participated effectively in the online interaction. However, Mobile Learning group had the highest level of online interaction with a mean score of 24.3966.

Research Question Three: Which of the departments has the highest level of interaction during online learning activities?

Table 3: Level of Interaction among Departments during Online Learning Activities

Departments	**N**	**MEAN**	**Between Groups**	**Within Groups**	**Df**	**Mean Square**	**F**	**Sig.**
Teacher Education	69	22.4638	372.451	9967.865	4	93.113	3.027	.018
G &C	75	21.4533						
Special Education	75	22.4400			324	30.765		
Human Kinetics	27	24.3333						
Adult Education	83	24.1687						

All the five departments participated effectively in online interaction. However, pre-service teachers from the Department of Human Kinetics had the highest level of online interaction with a mean score of 24.3333.

Research Question Four: Does gender have influence on the pre-service teachers level of interaction during online learning activities?

Table 4: Influence of Gender on the Pre-Service Teachers' Level of Interaction during Online Learning Activities

Variables		N	Sig.	Mean	Std.D	T	Df	Sig.(2 tailed)
Online Interaction	Male	146	0.187	24.8356	7.3099	-.489	327	.626
	Female	186		25.8710	7.2279	-.496	323.769	.621

The result presented in Table 1.4 shows that gender had no significant influence on the pre-service teachers' participation in online interaction. This implies that both male and female pre-service teachers interacted effectively in the online environment.

Research Question Five: Does area of specialization have influence on the pre-service teachers level of interaction during online learning activities?

Table 5: Influence of Area of Specialization on the Pre-Service Teachers' Level of Interaction during Online Learning Activities

Specialisation	N	MEAN	Between Groups	Within Groups	Df	Mean Square	F	Sig.
Science	39	24.6410	296.035	10044.281	3	98.678	3.193	.024
Arts	136	22.7059			325	30.905		
Social Sciences	124	21.9677						

The result reveals that all the pre-service teachers from the three areas of specialization participated effectively in online interaction. However, pre-service teachers from science-related field had the highest level of online interaction with a mean score of 24.6410.

Discussion

The result shows a high level of interaction by pre-service teachers during online learning activities. In other words, students were able to express themselves better on online platforms than the traditional face-to-face instructional delivery. This is in line with the findings by Lee, Hong and Ling (2001) that prior studies have shown that students, in general, have a positive attitude towards internet usage and spend more time with online tools. The implication of this is likelihood of the students being satisfied with their online experiences which inevitably

could make them to become more responsible for their learning. Brower's (2003) investigation on interactivity in distance education class discovers that an online tool (bulletin board) supports quality discussions and collaborative learning. This might not be unconnected with the fact that students, especially at the higher levels, are already familiar with the rudiments of interaction and sharing of opinions on social media for purposes other than instructional. Perhaps, their experience with online tools must have facilitated their level of engagement in using online platforms for learning purposes. Majority of the pre-service teachers indicated that they learn better using online platforms. This means that these groups of students were able to use online tools that they were already familiar with, for learning instructional purposes.

The findings also revealed that all the five groups (Social Media, Mobile Learning, UGC, Games and Puzzles and Digital Story) participated effectively in online interaction. However, Mobile Learning group had the highest level of online interaction with a mean score of 24.3966. It is instructive to note that students in the mobile learning group conducted most of their practical classes using online tools on their mobile phones. It is possible that this could have placed them on a suitable pedestal to interact more in the online learning activities. Their proficiency in the use of this technology in the practical classes may have enhanced their online interaction in the general class. Therefore, it can be deduced that previous experience or background in using online tools could be a significant factor in students' interaction in the virtual environment.

Also, there was no significant influence of gender on the pre-service teachers' interaction in online learning activities. This implies that online learning is not gender-sensitive as both male and female participated effectively in the online discussion. This is in line with Yukselturk and Bulut (2007) who found that gender variable was unrelated to learning outcomes in online courses. According to Sierra and Wang (2002), "findings from several sources (e.g. online observations, survey, and chat transcripts) did not reveal any significant gender differences in the online discussions." This might not be unconnected with the fact that the 21st Century students are surrounded with different technological tools to interact and share their opinions with their tutors and classmates. Every student,

irrespective of age or gender, needs to acquire digital literacy and technological skills to function effectively in this modern society.

Lastly, the finding shows that all the pre-service teachers from the three areas of specialization, i.e. Science, Arts and Social Sciences, participated effectively in online interaction. However, pre-service teachers from science had the highest level of online interaction with a mean score of 24.6410. In other words, the areas of specialization with a significant value of 0.024 had influence on the pre-service teachers' level of online interaction. This could be due to the background these students have in science related courses. Their experiences in different science subjects could have placed them on sound pedestals to value and appreciate the capabilities of using technological tools for instructional purposes. Although teachers across different disciplines use technology to enhance classroom instructions, it is very likely that pre-service teachers with science related background would appreciate the contributions of digital tools to instructional delivery more than their counterparts in other fields of study. This implies that students' areas of specialization needs to be given due consideration while planning and implementing online learning activities.

Conclusion

Interaction among the tutors, students and the course materials remains a strategic component in measuring the quality and quantity of online learning activities across all levels of education. Since students do not have the privilege of physical contact with the tutor during online discussion, the onus lies on the teacher to consistently maintain effective interaction with the students to ensure a robust and all-inclusive online learning process. Studies have revealed that many students measure the success and effectiveness of online learning by the quality of interaction they are able to establish and maintain throughout the online learning process. Therefore, for online learning to achieve the objectives of flexibility and accessibility, students' interaction should remain a critical factor of consideration at every level of virtual course design and development.

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