WEB 2.0 TECHNOLOGIES AND PRE-SERVICE TEACHERS' EMOTIONAL INTELLIGENCE IN A FLIPPED LEARNING CLASSROOM

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ABSTRACT

The study investigated the possible effects of the use of Web 2.0 technologies on pre-service teachers' emotional intelligence in a flipped learning classroom. The study adopted the pre-test post-test 2 group quasi experimental design. The population of the study was four hundred and seventy-one (471) fourth year students who took the Course Computer in Education from the Department of Educational Management, Faculty of Education, University of Port Harcourt, Nigeria. Based on some criterion, a purposive sampling of seventy (70) students participated in the study. This was an intact class. The instrument used for collecting data was Bar - On's (1997) Emotional Intelligent Quotient (EQ – i). It is a 133-item questionnaire measured on a 5-point Likert-scale with 1 as Strongly Disagree and 5 as Strongly Agree. Two research questions and two hypotheses were used for the study. The research questions were answered using mean while Z-test was used to test the hypotheses. The findings established that there was no significant difference in the emotional intelligence of pre-service teachers' who used Web 2.0 technologies and those who did not. The pretest and post test scores of both the online and face to face groups were not significantly different. It was recommended that social and emotional intelligence programmes should be included in the school curriculum.

Keywords: Emotional Intelligence, Web 2.0, Flipped classroom.

INTRODUCTION

Information and Communication Technologies (ICTs) have changed the way we communicate and have given birth to a new form of collaboration that is unprecedented. They have provided humans with various forms of communication capabilities which have turned the world into a global village. The Internet, which is one major aspect of ICTs, has greatly influenced human activities. Ever since its proliferation in 1997, various features of the Internet have been adopted and used in appropriate settings. Of all the features of the Internet, the most influential is the World Wide Web (WWW). Its second generation also known as Web 2.0, has several applications that have promoted communication and collaboration. These applications could be categorized as follows:

Table 1: categories of Web 2.0 Technologies

S/N	WEB 2.0 TECHNOLOGIES	Examples
1	Blogs	Blogger, Xanga, Word press.com
2	Forum	Usenet creates several forums
3	Wikis	Wikipedia, WikiWikiweb, wikitravel, wikiHow e.t.c
4	Video sharing sites	YouTube, Viddler, Vimeo e.t.c
5	Social networks	Facebook, Twitter, 2Go, Google +
6	Social bookmarking:	Digg, delicious, reddit e.t.c
7	Instant Messengers	Facebook messenger, Whatsapp, WeChat, Snapchat e.t.c)

One of the areas that web 2.0 has greatly influenced is education. Web 2.0 technologies have created a paradigm shift in education and have transformed our classrooms. In the past, a typical classroom would see students seating to receive lectures from a teacher, whom they see as a repertoire of knowledge. He dispenses every information on the subject matter and students just sit and listen. At the end of a certain period, students' knowledge of the subject matter is tested through some classroom examinations, where a student ends up giving back to the teacher what the teacher taught in class. However, with the new technologies, all of these have changed. Students are no longer passive in classrooms. They now take responsibility for their learning and actively engage in knowledge construction. There is a level of interaction that makes both the teacher and students co-learners in the classroom. Students can go online to make research on a given topic and come back to the class to discuss their findings and make valuable contributions. This kind of learning environment is called a flipped classroom.

LITERATURE REVIEW

Flipped classroom

The governing board and key leaders of flipped learning network (2014) announced a formal definition of the term: "flipped learning is a pedagogical approach in which direct institutions moves from space, and resulting group space is transform into a dynamic, interactive learning environment where the educator guides students as they apply concepts and engage creativity in the subject matter". The term Flipped classroom typically refers to a pedagogical method where a typical classroom work and home work are reversed. EDUCAUSE (2012) describes the flipped classroom as one in which short video lectures are viewed by students at home before the class session and then in-class time is devoted to exercises, projects, or discussions. While the use of video lectures is what basically characterizes the flipped classroom, it is not really the technology that matters. The essence of allowing students to view these lectures at home is to enable them participate actively in class discussions. However, with several new technologies, a flipped classroom does not have to be limited to the use of video lectures. In the real sense, a flipped classroom may or may not use technology. Thus, the aim of flipping a classroom should be to enhance students' learning and deep understanding of concepts which can be transferred to other work spaces. If an instructor intends using any form of technology in flipping a class, it should be geared towards collaboration and higher level thinking. Incorporating Web 2.0 technologies into a flipped classroom affords students the opportunity to contribute effectively to class discussions, create new ideas and collaborate in class sessions. It also enhances critical thinking.

Flipped classrooms help students learn to correct misconceptions and organize their new knowledge such that it is more accessible for future use. Flipped classrooms also give immediate feedback to students which allows them recognize and think about their own growing understanding of a course content. The idea behind the flip is that teachers can spend time to students who need more clarification of the course in the classroom and students can on their own solve problems. To enhance collaboration in a flipped classroom, students could work in small groups and discuss their findings when they come back to the class. In the classroom, they apply the knowledge gained by solving problems. Thus, they become active learners. Bergmann, Overmyer, & Wilie, (2012) opined that active learning can include activities, discussion, student created content, independent problem solving, inquiry-based learning and project-based learning. This use of class-time can provide a learning environment that uses collaborative and constructivist learning. Constructivist instruction takes place when students are allowed to construct their own knowledge from the prior knowledge. One of the essential criteria of flipped classroom is project based learning. It allows students search for a solution to a problem given to them, thus allowing them to construct their own knowledge thereby making learning effective. The Instructor on the other hand, tutors the students in any area they find difficult. He thus becomes a facilitator. Inverted classroom makes students more active than traditional learning approach, and active learning has been found to produce better grades than passive learning (Minhas, Ghosh, & Swanzu, 2012). Meanwhile, through engaging in group activities such as discussion and problem solving, a flipped classroom can achieve a greater level of collaborative learning.
Many authors have written on the effectiveness of flipped learning. Armbruster et al. (2009) in Adam Butt (2014) investigated the perception and performance of students in an introductory biology course where flipped learning was introduced via student being required to engage in a group and solve problem in class settings. The findings showed that students performance was significantly increased compared to previous version of the course. Strayer (2008) sees the flipped classroom method as best. He opined that students in a flipped classroom display a higher level of problem solving skills in a creative and unique way and have familiarity working with others to discuss ideas and solve problems than students in a traditional classroom environment. It is found in this study that students in a flipped classroom experience a lower level of task orientation than students in traditional setting. However, as students collaborate in a flipped classroom, conflicts are bound to arise. Their ability to manage these conflicts as they work in small groups will determine the successful completion of any class project they are handling. This is why emotional intelligence is an important concept in this research.

Web 2.0 technologies and emotional intelligence

Plato said that all learning has an emotional base (Dam, 2013). The implication is that an individual's emotional state of mind can affect his ability to learn. Thus, emotional intelligence cannot be separated from learning. While adopting various technologies to enhance learning, it is important that instructors consider the role human emotions play in learning. Mayer and Salovey (1990) define emotional intelligence as *a form of social intelligence that involves the ability to monitor one's own and others' feelings and emotions, to discriminate among them, and to use this information to guide one's thinking and action***.** In 1997, they came up with another definition which sees emotional intelligence as the ability to perceive emotions, to access and generate emotions so as to assist thought, to understand emotions and emotional knowledge, and to reflectively regulate emotions so as to promote emotional and intellectual growth (Mayer and Salovey, 1997 cited in Hein, 2005). Segal, Smith, and Shubin (2016) define Emotional intelligence (EQ) as the ability to identify, use,

understand, and manage one's emotions in positive ways to relieve stress, communicate effectively, empathize with others, overcome challenges and defuse conflict. According to the authors, this ability also allows one to recognize and understand what others are experiencing emotionally. According to Psychology Today (1991-2017), emotional Intelligence is generally said to include three skills:

1. Emotional awareness, including the ability to identify your own emotions and those of others;
2. The ability to harness emotions and apply them to tasks like thinking and problems solving;
3. The ability to manage emotions, including the ability to regulate one's own emotions, and the ability to cheer up or calm down another person.

Similarly, Segal, Smith, and Shubin (2016) believe that emotional intelligence is commonly defined by four attributes:

1. **Self-awareness** – this happens when an individual recognizes his own emotions and how they affect his thoughts and behavior. He knows his strengths and weaknesses, and have self-confidence.
2. **Self-management** – in this situation, the individual is able to control impulsive feelings and behaviors, manage his emotions in healthy ways, take initiative, follow through on commitments, and adapt to changing circumstances.
3. **Social awareness** – an individual can understand the emotions, needs, and concerns of other people, pick up on emotional cues, feel comfortable socially, and recognize the power dynamics in a group or organization.
4. **Relationship management** – the individual knows how to develop and maintain good relationships, communicate clearly, inspire and influence others, work well in a team, and manage conflict.

Web 2.0 technologies, flipped classroom and the zone of proximal development (ZPD)

The zone of proximal development (ZPD) is the difference between an individual's current level of development and his or her potential level of development. It is considered to be the distance between a student's ability to perform a task under adult guidance and/or with peer collaboration and the student's ability to solve problems independently. The ZPD is one of the themes of Vygotsky's socio-cultural theory. Vygotsky believes that there are two levels of learning. The first level (blue area) is the level of development the learner has already reached – the level at which he/she can solve problems independently (see Figure 1).

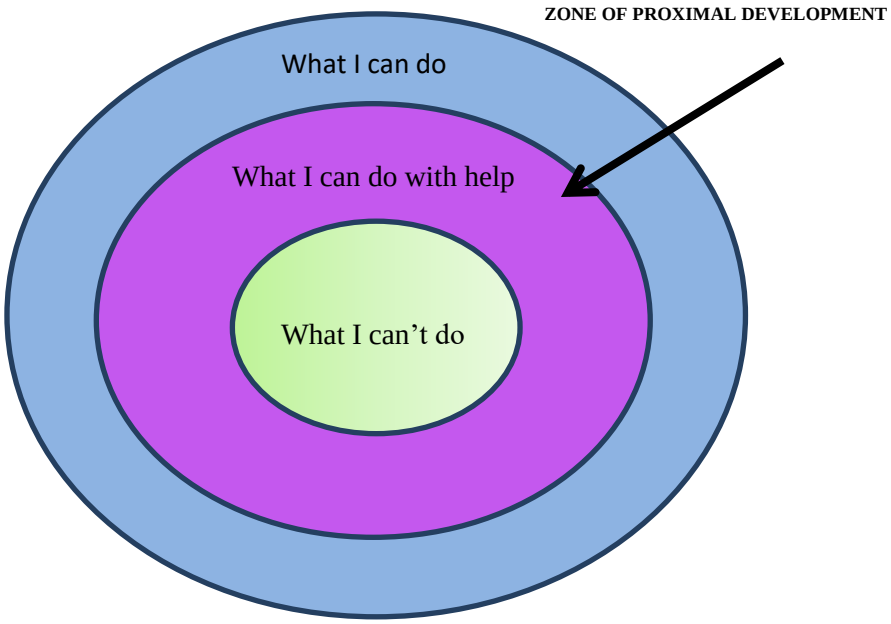

Fig. 1 diagram showing the Zone of proximal development

Source: *Innovative learning .com (2013) (http://www.instructionaldesign.org/theories/social-development.html)*

At this level, the learner can accomplish any task given to him without help from any one. The second level (Purple area) is the level where a learner has the potential to accomplish a task or solve a problem if he gets help from others (see fig 1). At this level, what the learner needs is structure, clues, reminders, help with remembering details, encouragement e.t.c. This is the level that Vygotsky calls the ZPD. Under the guidance of teachers or in collaboration with peers, learners can solve problems and accomplish tasks in the ZPD. This collaboration continues until the learner can solve that problem independently.

At the ZPD, the teacher or more experienced peer provides scaffolding to support the learner's evolving understanding of knowledge domains or development of complex skills (UNESCO, 2002). Vygotsky's scaffolding refers to the provision of support and resources to help a child learn new skills, and then gradually removing the support as the child improves. It is tailored to the needs of the student with the intention of helping the student achieve his/her learning goals (Sawyer, 2006). The teacher can provide such support by modelling, giving advice or coaching. These supports include:

- resources
- a compelling task
- templates and guides
- guidance on the development of cognitive and social skills
- outlines
- recommended documents
- storyboards
- key questions.

Reciprocal scaffolding can be used by the teacher to provide these supports. Reciprocal scaffolding is a method that involves a group of two or more collaboratively working together. In this situation, the group can learn from each other's experiences and knowledge.

The scaffolding is shared by each member and changes constantly as the group works on a task (Holton and Clarke, 2006). According to Vygotsky (1978), students develop higher-level thinking skills when scaffolding occurs with an adult expert or with a peer of higher capabilities.

It is at this point it becomes necessary that an instructor should incorporate web 2.0 technologies into the flipped classroom. Using the appropriate technology in a flipped classroom gives the learner access to relevant resources and enhances his understanding of difficult concepts. Moreover, as the learner connects with other peers using social media technologies, he extends his frontiers of knowledge, improves his social relationships and enhances his social and emotional intelligence. Thus, his ZPD continues to extend. The utilization of Web 2.0 into the flipped classroom is one effective way of extending the ZPD and improving a learner's emotional intelligence.

METHODOLOGY

Objectives

The purpose of the study is to determine the effect of Web 2.0 technologies on pre-service teachers' emotional intelligence in a flipped learning classroom.
Specifically, the study has two objectives which are:

1) To ascertain the difference in the pre-test emotional intelligence scores of students who used web 2.0 technologies and those who did not.
2) To determine the difference in the post-test emotional intelligence scores of students who used web 2.0 technologies and those who did not.

Research questions

The following research question will guide the study:

1) What is the difference in the pre-test emotional intelligence scores of students who used web 2.0 technologies and those who did not?
2) What is the difference in the post-test emotional intelligence scores of students who used web 2.0 technologies and those who did not?

Hypotheses

H0:1 there is no significant difference in the pre-test of the emotional intelligence of pre-service teachers' who used Web 2.0 technologies and those who did not.
H0: 2 there is no significant difference in the post-test of the emotional intelligence of pre-service teachers' who used Web 2.0 technologies and those who did not.

The study investigated the possible effects of the use of Web 2.0 technologies on pre-service teachers' emotional intelligence in a flipped learning classroom. The study adopted the pre-test post-test 2 group quasi experimental design. The population of the study was four hundred and seventy-one (471) fourth year students who took the Course Computer in Education from the Department of Educational Management, Faculty of Education, University of Port Harcourt. Based on some criterion, a purposive sampling of seventy (70) students participated in the study. This was an intact class. The Instrument used for collecting data was Bar - On's Emotional Intelligent Ouotient (EQ – i). Two research questions and two hypotheses were used for the study. The research questions were answered using mean while Z-test was used to test the hypotheses.

RESULTS

Research question 1: What is the difference in the pre-test emotional intelligence scores of students who used web 2.0 technologies and those who did not?

Research question 2: What is the difference in the post-test emotional intelligence scores of students who used web 2.0 technologies and those who did not?

Table 2: Gain scores of the effect of Web 2.0 Technologies on Pre-service teachers' emotional intelligence

Variables	Group	Pre-test mean	Post-test mean	Gain mean	Gain %
Emotional Intelligence	Web 2.0 group	328.62	320.82	-7.8	-2.37
	Face-to-face group	316.94	310.85	-6.09	-1.92

Table 2 shows that the students taught using web 2.0 technologies had a negative percentage gain of -2.37% while those in the face-to-face group had a negative percentage gain of -1.92%. Also, comparing the means of the pre-test and post-tests scores for both groups, it could be noticed that the post-tests scores were lower than the pre-test scores.

Hypothesis 1: there is no significant difference in the pre-test of the emotional intelligence of pre-service teachers' who used Web 2.0 technologies and those who did not.

Table 3: Z-test showing results of the pre-test of the emotional intelligence of pre-service teachers who use Web 2.0 technologies and those who do not.

Variables	**N**	**Mean**	**SD**	**df**	**Z-cal**	**Z-tab**	**Remarks**
Web 2.0 group	35	328.62	38.47	68	1.27	1.96	Not significant
Face to face group	35	316.94	38.01				

Table 3 shows the results of the pre-test carried out to determine the difference in the emotional intelligence of pre-service teachers who used web 2.0 technologies and those who did not. The table shows that the students who used web 2.0 technologies had a mean achievement of 328.62 (SD=38.47) while the students who did not use web 2.0 had a mean achievement of 316.94 (SD= 38.00). The Z- calculated value of 1.27 which is less than the Z-critical value of 1.96 suggests that there is no significant difference in the emotional intelligence of the two groups. The null hypothesis which states that there is no significant difference in the academic achievement of pre-service teachers who use Web 2.0 technologies and those who do not was accepted. Accepting the null hypotheses implies that before the use of web 2.0 technologies the two groups were equal.

Hypothesis 2: there is no significant difference in the post-test of the emotional intelligence of pre-service teachers' who used Web 2.0 technologies and those who did not.

Table 4: Z-test showing results of the post-test of the emotional intelligence of pre-service teachers who use Web 2.0 technologies and those who do not.

Variables	N	Mean	SD	df	Z-cal	Z-tab	Remarks
Web 2.0 group	35	320.82	39.18	68	0.85	1.96	Not significant
Face to face group	35	310.85	56.75				

P<0.05

Table 4 shows the results of the post-test to determine the difference in the emotional intelligence of pre-service teachers who use web 2.0 technologies and those who do not. From the results, it can be seen that there is no significant difference in the emotional intelligence of pre-service teachers who use web 2.0 and those who do not. The mean and SD of pre-service teachers who used web 2.0 technologies was 320.82 and 39.18 respectively, while the mean and SD of pre-service teachers who did not use web 2.0 are 310.85 and 56.75 respectively. Since the Z- calculated value of 0.85 is less than the Z- critical value of 1.96, the null hypothesis was accepted. This means that there is no significant difference in the emotional intelligence of the two groups after the treatment was given to the experimental group.

DISCUSSION

From table 2, it could be seen that the gain scores of the two groups were negative: (-7.8) for the virtual group and (-6.09) for the face-to-face group. Their percentage gain was also negative: -2.37 & -1.92 respectively. Results from Tables 3 and 4 showed that there was no significant difference in the emotional intelligence of pre-service teachers who used web 2.0 technologies and those who did not. The Z- calculated value for the pre-test and post-test scores were less than the Z- critical value, so the null hypothesis was accepted.

This result is surprising because it is expected that face-to-face communication which has more verbal and non-verbal cues should increase emotional intelligence. Thus, the emotional intelligence of the students in the face-to-face group should be higher. Rossi de Mio (2002) cited in Rossi de Mio (2003) suggests that due to the different communication channels, virtual communication channels may lead toward different levels of emotional intelligence compared to face-to-face communication. Studies by Sudweeks and Albritton (1996) cited in Rossi de Mio (2003) suggests that when groups work online using web 2.0 technologies, it takes longer to develop norms and social relationships. This may lead to lower levels of emotional intelligence in virtual groups. In their study, Pitts, Wright, and Lindsey, (2012) assessed the relationship between emotional intelligence and quality of team communication and they discovered that there was a significant relationship between emotional intelligence and team communication. If this is the case, then, it is a surprise that there is no significant difference in the emotional intelligence of students who used face-to-face communication and those who used web 2.0 technologies, since the increased use of electronic communication reduces verbal and nonverbal cues in virtual teams compared to face-to-face communication.

CONCLUSIONS

From the foregoing, it can be seen that web 2.0 technologies can be used in a flipped classroom. Though, there was no significant difference in the emotional intelligence of students who used web 2.0 technologies and those who did not, however incidental findings

showed that web 2.0 technologies enhanced students cooperative and information literacy skills. Thus, educators and students should start incorporating these technologies into their classrooms.

RECOMMENDATIONS

1. Social and emotional intelligence programmes should be established in schools to enhance the emotional intelligence of both instructors and students.
2. Instructors should be trained on how to incorporate various web 2.0 technologies into their courses.
3. Students should be encouraged to use these technologies for academic purposes and not just for entertainment.

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