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## Maximizing the effects of collaborative learning through ICT

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### Abstract

This study investigated the effects of ICT facilities on collaborative learning (CL) in Imo State University (IMSU), Owerri in Nigeria. It adopted a descriptive survey design with a researcher-made questionnaire as the instrument. Sixty (60) lecturers selected from across the faculties served as the sample. The data collected were analyzed using mean scores. The study revealed the ICT facilities used in IMSU to enhance CL; ICT facilities enhance CL by helping to increase the level of participation of students, etc. The study also revealed some problems encountered in the use of ICT in CL. Some recommendations were also made.

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### 1. Introduction

Collaborative learning (CL) is an umbrella term used for a variety of educational approaches involving joint intellectual efforts by students or students and teachers together. Usually students are made to work in groups of two or more, mutually searching for understanding, solutions or meanings or creating a product. According to Dillenbourg (1999) CL is defined as “a situation in which two or more people learn or attempt to learn something together”. It can be seen as social interactions that are targeted towards deeper knowing. CL refers to an instruction method in which students are responsible for one another’s learning as well as their own. Thus, the success of one student helps other students to be successful.

Proponents of CL claim that the active exchange of ideas within small groups not only increases interest among the participants but also promotes critical thinking. According to Johnson & Johnson (1986), there is persuasive evidence that cooperative teams achieve at higher levels of thought and retain information longer than students who work quietly as individuals. The shared learning gives students an opportunity to engage in discussion, take responsibility for their own learning and thus become critical thinkers.

CL is a variation of cooperative learning which exists when students work together in groups to achieve common goals. Collaborative learning differs from cooperative learning in that it gives students more freedom to work independently from the instructor, within their group while still adhering to the principles of cooperative learning. In this paper, both terms will be used interchangeably to mean a situation where students work in groups.

CL encompasses the following processes: firstly, students encounter a phenomenon or are presented a problem or task. This can be referred to as the triggering event. In trying to resolve the problem, students discuss and agree on the theme of inquiry or the identified problem. This initial discussion helps to cultivate a sense of ownership to the

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problem among the groups of students. With the activity jointly established, students could then proceed towards further discussion. This will undoubtedly lead to idea improvement and argumentative knowledge construction.

Lehtinen (2003) as cited by Wang (2008) gave some more features of collaborative study. He noted that successful collaborative study models are characterized by equality and mutuality. Collaborative study allows learners to be treated equally and requires that they mutually respect each other. Though this requirement cannot be enforced, but it must be facilitated. Learners in such an instructional environment are more willing to study because their gains and efforts are shared and the sharing provides a fearless environment that is rarely attained in conventional school settings. It dissolves the stress in relationship among students, teachers and administrators.

### *1.1 Use of information and communication technology (ICT)*

The use of ICT in CL will make it easy for people to collaborate easily with someone far away as they would with someone in the same room. E-collaboration technologies allow people to bring diverse skills on collective ventures that eliminate the barriers of time, distance and resources (Bessagnet, Schlenker, & Aiken, 2005). ICT is not designed to replace face-to-face interaction; it is designed to supplement it by allowing people to communicate anytime and anywhere. ICT as a collaborative technology offers functionalities for co-ordination of group work, tools for recording progress and giving feedback, libraries of solutions and best practices as well as meta-information (that is date, author and sequence of contributions).

According to the Australian Government Report (nd) on the benefits of collaboration in teaching and learning, the following technology tools can be used to support collaborative learning in all sectors of education.

**Wikis:** Collections of linked web pages editable by anyone, allowing collaborative content creations. Wikipedia is a good example.

**Microblogs:** Brief updates posted by users on any chosen topic for other users to see. Twitter is a good example of microblogging service.

**Social Networking Services:** Web services that allow users to interact in various ways including sharing photos, messaging publicly and privately, and sharing information about themselves on their profiles. Facebook is the largest social networking site in the world.

**Virtual Worlds:** Software applications that provide users with the experience of being agents in online environments with their “self” represented by an avatar or online persona.

**Online Games:** Games played with and against other users over the internet.

According to Farren & Tweedy (2002) videoconferencing can be used to enhance collaborative learning. Videoconferencing is one application of ICT that involves using appropriate hardware and software to enable two or more people in different locations to see and hear each other at the same time, sometimes even sharing computer applications for collaboration. The standardization and increasing adoption of these technologies has vastly affected the way people choose to communicate, learn and work. The internet and online tutorials offer a more expansive world to explore compared to traditional lectures. This gives students the freedom and flexibility to learn at their own pace and they may find it easier to concentrate and learn than following a teacher’s thought process during a lecture (Anderson, 2004).

In summary, Becta (2008) gave some benefits of using ICT to support CL thus:

- Students’ engagement and participation is increased, particularly for quieter students who can work collaboratively online without anxiety of raising questions in front of the class. Students can also express themselves through less traditional avenues such as video.
- Social networking can encourage online discussion amongst students outside school hours.
- Tolls can be available anytime and anywhere, which encourages some students to extend their learning through further investigation into topics that interest them.

- Students feel a sense of ownership and engagement when they publish their work online and this can encourage attention to detail and improved quality of work overall. Some teachers use the publication of work to encourage peer assessment.

## **2. Methodology**

A descriptive survey design was adopted for this study. The target population was all the academic staff in Imo State University, Owerri Nigeria which totaled to 1200 spread out in eleven faculties. Sixty (60) lecturers were randomly selected from across the faculties. A researcher-made questionnaire was used to collect data. This questionnaire had two sections A & B. section A was on demographic information. Section B solicited information on the ICT facilities used to enhance CL, the ICT facilities utilized in Imo State University for CL, ways these facilities enhance CL and the problems encountered in the use of these facilities. The data collected were analyzed using means.

### *2.1 Statement of the problem*

To improve the academic performance of students, teachers should look out for better and more innovative methods of teaching that will involve the learners. As the teachers' role has been changed to that of a facilitator of learning, it behooves him/her to help the learners discover knowledge themselves. Knowledge discovered by the learners tends to be retained longer and applied in life. CL will help learners in the groups to fully participate in knowledge acquisition. The researcher wants to find out how application of ICT to CL will be of benefit.

### *2.2 Purpose of the study*

The study investigated the ways the effects of CL can be enhanced using ICT. Specifically this study sought to find out:

- ICT facilities that can be used to enhance collaborative learning.
- The ICT facilities utilized in Imo State University for CL.
- Ways these facilities can enhance CL and
- The problems encountered in the use of these facilities.

### *2.3 Research questions*

To guide this study, the following research questions were used;

- What are the ICT facilities used in CL?
- What ICT facilities are utilized in Imo State University to enhance CL?
- In what ways do these facilities enhance CL?
- What are the problems encountered in the use of these ICT facilities?.

## **3.0 Findings**

### *3.1 Research question 1*

What are the ICT facilities that can be used in collaborative learning?

1: Responses Table on the ICT facilities that can be used in CL.

S/N	Item	SA	A	D	SD	$\bar{X}$
1	Social networking services e.g. Facebook,2-2go, Twitter	24	35	1	-	3.4
2	Virtual worlds (software applications that provide users with the experience of being agents in online environments with their "self" represented by an avatar or online persona)	12	15	31	-	28
3	E-mail	26	34	-	-	34
4	Online Games	20	36	4	-	3.3
5	Newsgroup/blogs/mircoblogs	22	09	29	-	2.9
6	Wikis	23	31	06	-	3.3
7	Web CT	24	34	02	-	3.4
8	Videoconferencing	28	32	-	-	3.5
9	Audio Conferencing	15	17	28	-	2.8
10	Use Of GSM Phones	16	16	28	-	2.8
11	World Wide Web	24	36	-	-	3.4

From the table above, items 1-11 have mean scores 3.4, 2.8, 3.4, 3.3, 2.9, 3.3, 3.4, 3.5, 2.8, 2.8 and 3.4 respectively. Since these items have mean scores above 2.5, it simply means that the following ICT facilities can be used for collaborative learning: social networking services, virtual worlds, e-mail, online games, newsgroup/blogs/microblogs, wikis, web CT, videoconferencing, audio conferencing, use of GSM phones and World Wide Web.

### 3.2 Research question 2

What ICT facilities are utilized to enhance collaborative learning in Imo State University?

Table 2: Responses on the ICT facilities lecturers use to enhance collaborative learning.

S/N	Item	Yes	% Yes	No	% No
1	Social networking services	34	57%	26	43%
2	Virtual worlds	24	40%	36	60%
3	E-mail	40	67%	20	33%
4	Online games	21	35%	39	65%
5	Newsgroup/blogs/mircoblogs	21	35%	39	65%
6	Wikis	23	38%	37	62%
7	Web CT or any other chat facility	34	57%	26	43%
8	Videoconferencing	34	57%	26	43%
9	Audio conferencing	36	60%	24	40%
10	Use of GSM phones	60	100%	-	-
11	World Wide Web	39	65%	21	35%

From the table above, only social networking services (57%), e-mail (67%), web CT (57%), videoconferencing (57%) audio conferencing (60%), GSM phones (100%) and World Wide Web (65%) are the ICT facilities that the lecturers in Imo State University use to enhance collaborative learning. Virtual worlds, online games, newsgroup/blog/microblogs and wikis are not used by lecturers for collaborative learning.

### 3.3 Research question 3

In what ways do these ICT facilities enhance collaborative learning?

Table 3: Table showing ways ICT facilities enhance collaborative learning.

S/N	Item	SA	A	D	SD	$\bar{X}$
1	ICT facilities increase the level of participation of students in collaborative learning	35	23	2	-	3.6
2	They encourage online discussion amongst students outside school	32	28	-	-	3.5
3	They give students the freedom and flexibility to Learn at their own pace and time	22	38	-	-	3.4
4	They encourage students to extend investigation into topics that are of interest.	22	38	-	-	3.4
5	They enable students get ideas from subject specialists all over the world.	35	25	-	-	3.6
6	With ICT, collaborative learning is not limited by time or distance	36	24	-	-	3.6

From the table above, items 1-6 have mean scores of 3.6, 3.5, 3.4, 3.4, 3.6 and 3.6 respectively showing that ICT facilities increase the level of participation of students; encourage online discussion amongst students outside school hours; give students the freedom and flexibility to learn at their own pace and time; encourage students to extend their learning through further investigation into topics that are of interest; and enable students get ideas from subject specialists all over the world. Also with ICT, collaborative learning is not limited by time or distance.

### 3.4 Research question 4

What problems are encountered in the use of these facilities?

Table 4: Showing the problems encountered in the use of ICT facilities.

S/N	Item	SA	A	D	SD	$\bar{X}$
Problems that hinder the use of ICT facilities in collaborative learning						
1	Inadequate supply of electricity	37	23	-	-	3.6
2	Limited access/poor communication infrastructure	36	24	-	-	3.6
3	Inadequate ICT skills by students	34	13	13	-	3.4
4	Inadequate ICT skills by lecturers	24	33	3	-	3.4
5	Over population of students	30	20	5	5	3.3
6	ICT phobia (fear of technology)	02	24	13	21	2.1
7	Lack of funds	31	24	4	1	3.4

From the table above, items 1-5 and 7 have been scores of 3.6, 3.6, 3.4, 3.4, 3.3, and 3.4 showing that the problems that hinder the use of ICT facilities are inadequate supply of electricity; limited access/poor communication infrastructure; inadequate ICT skills by students; inadequate skills by lecturers; over population of students and lack of funds. Item 6 with a mean score of 2.1 shows that ICT phobia is not a problem militating against the use of ICT facilities in collaborative learning.

#### **4. Discussion**

The study revealed that the following are ICT facilities that can be used for collaborative learning: social networking services (e.g. Facebook, 2go, Twitter), virtual worlds, e-mail, online games, newsgroup/blog/microblogs, wikis, Web CT or any other chat facility, videoconferencing, audio conferencing, GSM phones and World Wide Web. This finding is in line with the Australian Government Report (nd) which listed wikis, microblogs, social networking services, virtual worlds and online games as technology tools that support CL in all sectors of education. In Imo State University, Owerri, Nigeria, only social networking services, e-mail, web CT, videoconferencing, audio conferencing, GSM and World Wide Web are used for collaborative learning.

This study also revealed ways ICT facilities enhance collaborative learning as increasing the level of student participation in CL; encouraging online discussion amongst students outside school; giving students the freedom and flexibility to learn at their own pace and time; encouraging students to extend their learning through further investigation, enabling students get ideas from subject specialists all over the world; and CL is not limited by time or distance when ICT facilities are used. Supporting this finding Bessagnet, Schlenker & Aiken (2005) opined that e-collaboration technologies eliminate the barriers of time, distance and resources. In line with the above, Becta (2008) opined that using ICT facilities in CL helps to increase students' engagement and participation. Furthermore, the fact that these tools can be available anytime and anywhere encourages students to extend their learning into topics that interest them.

The study further showed the problems encountered in the use of ICT for CL as inadequate supply of electricity, limited access/poor communication infrastructure; inadequate ICT skills by students and lecturers; over population of students and lack of funds. Nigeria being a developing country is still grappling with electricity problems. The above listed problems are responsible for the lack of use of many ICT facilities in CL in Imo State University, Owerri. Ezekoka (2010) listed the following as barriers to the use of ICT in Nigeria: lack of ICT skills, lack of motivation and confidence in teachers using ICT, lack of pedagogical teacher training, the absence and poor quality of ICT infrastructure, limited access to ICT equipment, lack of ICT main streaming into school strategies and epileptic power supply.

#### **5. Conclusion**

This study has examined the benefits of using ICT facilities in CL. Any method of teaching that encourages students' engagement and participation as CL should be encouraged. When students are involved in finding knowledge or in problem solving they tend to retain any knowledge acquired for a longer period. The use of ICT in CL should be encouraged in schools. ICT enhances CL in many ways as it does not restrict learning to particular times or places. It also exposes the learners to subject specialists all over the world.

#### **6. Recommendations**

Based on the findings of this study, the following recommendations were made;

- Lecturers should encourage the use of ICT for collaborative learning by giving assignments/projects that require ICT facilities.
- The government should provide online services in the institutions of higher learning and at cheap prices to encourage students to utilize them.
- Generators should be available to help power these online services as alternative source of power.
- Workshops and seminars should be organized from time to time for lecturers on the use of ICT facilities to enable them acquire the necessary ICT skills.

- Undergraduate students should be made to take their computer lessons in General studies very seriously. The instructors should make the lessons more practical to enable the students acquire the ICT skills needed for their studies

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