



AN ASSESSMENT OF THE EFFICACY OF ELECTRONIC COMMUNICATION DEVICES
AS TOOLS OF INSTRUCTIONAL ENHANCEMENTS: THE CASE OF THE FACULTY OF
EDUCATION, UNIVERSITY OF PORT HARCOURT, NIGERIA

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ABSTRACT

The development of electronic communication technologies has generated a considerable amount of excitement among practitioners and academics because it results in shifting the academic environment from traditional settings to electronic learning (e-learning) settings. This study looked at Students' Use of Electronic Communication Devices for Instructional Enhancements in the faculty of education, university of Port Harcourt, Nigeria. The study adopted a descriptive survey design with a population of 1,760 final year students of the faculty of Education, University of Port Harcourt from which a sample size of 205 students was selected using simple random sampling technique. The instrument used for this study was Questionnaire tagged "Students' Use of Electronic Communication Devices for Instructional Enhancements Questionnaire (SUECDIEQ)". The findings of this study revealed among others electronic communication devices would help students to exchange information and communicate with other students from other universities in the world, source for learning materials and share ideas with other students. The problems inhibiting the appropriate use of these electronic devices in teaching and learning in universities include: the cost of these electrical communication devices, inadequate finance to procure these facilities, poor electricity supply in the country, lack of electrical communication skills among teachers and students, limited access to the internet, and lack of proper maintainers of the available electronic communication devices.

Keywords: Communication Devices, Learning Materials, Universities.

1. INTRODUCTION

As teachers in tertiary education look for new ways of enhancing their traditional ways of teaching, the need for flexible tools to support well planned blended learning scenarios emerges. The development of electronic communication technologies has generated a considerable amount of excitement among practitioners and academics because it results in shifting the academic environment from traditional settings to electronic learning (e-learning)

settings. Increasing numbers of institutions of higher education offer courses using electronic communication technologies as alternative teaching and learning tools.

Electronic communication is the newest medium for the transfer of information. Its usage has been on a steady increase for the past five years to the point where it is in many cases, the chief means of interaction between people. It is particularly prevalent among the younger members of the society. The new generation has openly embraced this new form of communication at an unprecedented rate. A staggering number of children and young adults now regard it as their preferred form of communication between their friends and the rest of the world, and as an essential tool for their own self-expression. Communication devices may be simple and designed just to enhance speech output, such as amplifiers; or they may be more complex, such as communication aids (phones or laptops) using communication software, which are designed to augment independent speech for students. Computers and other electronic communication devices (ECDs) have become vital tools in accomplishing the University's mission. Most employees and students depend on these devices daily to accomplish their work, and the University invests in and supports a variety of equipment and information technology (IT) related items.

The development of electronic communication technologies has generated a considerable amount of excitement among practitioners and academics because it results in shifting the academic environment from the traditional settings to electronic learning (e-learning) settings. Increasing numbers of institutions of higher education offer courses using the electronic communication technologies as alternative teaching and learning tools. Computers and other electronic communication devices (ECDs) have become vital tools in accomplishing the University's mission. Most employees and students depend on these devices daily to accomplish their work, and the University invests in and supports a variety of equipment and information technology (IT) related items. These IT resources are not unlimited; however, it is important to assure that they are used appropriately.

1.1 Students' Use of e-Learning Devices in their studies

With the growing interest in communication network, there is a demand for efficient and reliable transport capabilities between the content providers and the end users (Hermsmeyer, Hernandez-Valencia, Stoll, & Tamm, 2007). According to Miller and Beasley (2002), a network is an interconnection that allows communication among users; it includes basic telephone operation, cellular phones, computer systems, space satellite, local area network (LAN) and Internet. In addition, all communication technology deals, with sending and receiving information (Fales, Kuetemeyer, & Brusica, 1999).

Electronic communication technology has revolutionized the composing process and participation in writing activities. Since e-mail provides a non-threatening atmosphere (Kupelian, 2001) and an arena for students to present their work beyond classroom boundaries (Karchmer, 2001), they are encouraged to write (Leibowitz, 1999). Electronic communications devices help build team skills, allow students to reflect on the learning process and outcomes, and provide teachers with continuous feedback (Nwabueze and Obaro, 2011). Students must recognize the importance of technology interaction and mutual respect. Teachers should model appropriate social skills, including ways of providing constructive feedback or eliciting more in-depth responses through probing questions. They should also reinforce these social skills by publicly commenting on ways students use them effectively.

Electronic communication is a very powerful tool and can have undesirable consequences if not used in an appropriate manner (Nwabueze, 2011). Because of the nature of electronic text based communication; messages are very easily misunderstood. Users of electronic communication must be very careful to ensure that what they write is interpreted

correctly by the recipient. This knowledge is often only gained after the user has experienced it for themselves through their own undesirable error (Woodruff, & Aoki, 2004). With the medium becoming exponentially more popular, places of mass discussion and self-expression are popping up on websites all over the world and have thousands of users pass through them daily, making this an important issue. It is important for the students to learn how to use the electronic medium, particularly as a method of self-expression. Electronic communication and its potential for self-expression is revolutionary. It has made the world remarkably smaller and allowed an enormous freedom of information and expression to be made possible.

1.2 The benefits of Electronic Communication to Undergraduates

The power of electronic communication device lies in its ability to promote what is known as deep learning. Deep learning does not occur simply because students are placed in groups; however, it emerges from the careful, sequenced assignments and activities “orchestrated” by a teacher committed to student learning. The research on deep learning has been ongoing, systematic, and convergent.

Nwabueze and Obaro (2011), show that electronic communication device enhances increased student engagement in class, active learning, group work, process continuity, higher level of learning, information sharing and exchange and innovative and creativity skills. This allows for increased accessibility to the information relevant to the course provide for a more pedagogically sound interaction with the information by students, encourage more thoughtful discussion by students about the information in the class, provide more equal participation in classroom discussion, enhance student interaction outside the class, provide a unique classroom assessment technique, enhance ability to archive and retrieve students’ work, and provide increased structure of information/ sources of information (Suraya, Shanton and Sherah, 2009).

Electronic communication devices create learning interactions between teacher and student, student and student, teacher alone and student alone. The academic benefits of electronic communication device have been shown to lead the way to improved student learning and revitalised teaching methods (Cuseo, 2005; Johnson, Johnson & Stanne, 2003; Skon, Johnson & Johnson, 2000). Researchers have also concluded that students who learn in electric communication devices develop improved interpersonal skills (Johnson & Johnson, 2000), and that they are better prepared for the modern participative workplace (Feichtner & Davis, 1991).

1.3 Statement of the Problem

Regardless of students’ interests in the use of electronic communication technologies in higher education, there is lack of electronic technology facilities in the higher education institutions in Nigeria. Less attention has been paid to the use of e-mail via mobile devices (mobile phones, hand-held computers/Pocket PCs, BlackBerry and similar devices, etc.). Inadequate attention has also, been paid to the instant messaging (IM) platforms, usually provided by the major Internet service companies (including Yahoo!, Microsoft MSN, Google, etc.).

Undergraduates equally are not using these technology devices for what they are meant for. They use them for series of bad practices that have negative impact on their academic activities (Nwabueze and Obaro, 2011). Some use the e-mails and online social networks to dupe people and play different kinds of foul games. Some use their phones for pornographic pictures and videos. Others have used these electronic devices for hooking up with men and prostitute around the university environment. These are not the original motive of creating these electronic communication devices. However, there are certain problems that inhibit the appropriate use of these electronic devices such as the cost of these devices, inadequate finance

to procure these facilities, poor electricity supply in the country which has dampen the use of electronics as well as lack of maintenance culture in the society. Before the new generation can fully take advantage of electronic communication, they must learn how to use it appropriately. Electronic communication is a very powerful tool and can have undesirable consequences if not used in an appropriate manner. Most people learn from experience, but this can lead to problems. Because of the nature of electronic, text based communication; messages are very easily misunderstood.

1.4 Objectives, Research Questions And Hypotheses

The objectives of this study are to:

- Find out the extent to which male and female undergraduates adopt e-learning devices in their studies;
- Ascertain the benefits which male and female undergraduates derive from the use of electronic communication devices.
- Determine the problems that inhibit the appropriate use of these electronic devices in teaching and learning in universities in Rivers State.

The research questions are:

- To what extent do the undergraduates adopt the e-learning devices in their studies?
- What are the benefits of the electronic communication devices to the undergraduates?
- What are the problems that inhibit the appropriate use of these electronic devices in teaching and learning in universities in Rivers State?

The hypotheses are:

- There is no significant difference between the mean scores of male and female undergraduates on the extent they adopt e-learning devices in their studies.
- There is no significant difference between the mean scores of male and female undergraduates on the benefits they derive from the use of electronic communication devices in their studies.
- There is no significant difference between the mean scores of male and female undergraduates on the problems that inhibit the appropriate use of these electronic devices in teaching and learning in universities in Rivers State.

2. MATERIALS AND METHODS

This study adopts a descriptive survey design, which involves the description of existing situation without manipulating the study subjects by answering the research questions and testing the hypotheses. The population of this study comprised all the final year regular students of the Faculty of Education, University of Port Harcourt. There are six departments in the faculty namely; Curriculum Studies/Educational Technology, Educational Management, Educational Foundations, Educational Psychology/Guidance & Counselling, Human Kinetics & Health and Adult & Non-Formal Education with a population of 1760 final year students (University of Port Harcourt Academic and Planning Report, 2012). The sample for this study comprised all the six (6) departments in the Faculty of Education, University of Port Harcourt. The simple random sampling technique was used to select 205 final year students which represent 11.7% of the Population. This will comprise both male and female. This is to ensure fair representation of students. The operational instrument used in this study was Questionnaire tagged “Students’ Use of Electronic Communication Devices for Instructional Enhancements Questionnaire (SUECDIEQ)” developed by the Researchers. This questionnaire was designed to elicit information on the use of electronic communication devices among undergraduates.

The questionnaire consists of two sections; “one and two”. Section one consists of personal information such as sex, faculty, etc. while section two consists of structured items based on the main variables of this study. The response option is modified Likert-type scale of four point ratings weighted as follows: strongly agree (4 points), Agree (3 points), Disagree (2points) and Strongly Disagree (1 point).

For the purpose of data analysis, numerical values will be assigned to each of the response scales. Based on this, a criterion mean of 2.5 was calculated to judge the mean response of the respondents. In analyzing the data, mean and standard deviation were used as the statistical tools to answer the research questions, while t-test was used in testing the hypotheses. The acceptance or rejection of any of the null hypotheses is based on the critical value of t-test and the calculated value at 0.05 alpha significant levels.

2.1 Data Analysis

Research Question 1: To what extent do the undergraduates adopt the e-learning devices in their studies?

Table 1 shows the mean scores and standard deviation of male and female undergraduates on the extent undergraduates adopt the e-learning devices in their studies. The male and female undergraduates responded high on all the items except item 5 with mean scores greater than the criterion mean of 2.5. The male and female undergraduates responded high that the extent undergraduates adopt the e-learning devices in their studies includes: Sharing of knowledge/information through E-learning facilities, Use of Internet to source for learning materials, Submission of assignments through e-mails, the use of CDs/VCDs for storing and retrieving learning materials/data, Using the web services to source information and fill academic forms, the use of computers for storing and retrieving learning materials, and the use of video camera in covering laboratory experiments and field trips.

Table 1: Analysis of Mean Scores of male and female undergraduates on the extent undergraduates adopt the e-learning devices in their studies

S/N	Use of e-learning devices by undergraduates in their studies	Male Undergraduates			Female undergraduates		
		\bar{x}	SD	Decision	\bar{x}	SD	Decision
1	Sharing of knowledge/information through E-learning facilities	3.29	1.61	High	3.14	1.42	High
2	Use of Internet to source for learning materials	2.91	1.34	High	2.86	1.31	High
3	Submission of assignments through e-mails	2.71	1.38	High	2.66	1.36	High
4	The use of CDs/VCDs for storing and retrieving learning materials/data	3.20	1.59	High	3.06	1.53	High
5	Using the Internet to write and submit examinations	1.38	1.19	Very low	1.05	0.89	Very low
6	Using the web services to source information and fill academic forms	3.00	1.52	High	3.20	1.54	High
7	The use of computers for storing and retrieving learning materials	2.64	1.29	High	2.52	1.23	High
8	The use of video camera in covering laboratory experiments and field trips	3.00	1.52	High	3.46	1.65	High

Research Question 2: What are the benefits of the electronic communication devices to the undergraduates?

Table 2: Mean Scores of male and female undergraduates on the benefits of the electronic communication devices to the undergraduates

S/no	Benefits of the electronic communication devices to the undergraduates	Male Undergraduates			Female Undergraduates		
		\bar{x}	SD	Decision	\bar{x}	SD	Decision
9	Electronic communication devices enhance increased student engagement in class	2.78	1.22	Agreed	3.03	1.30	Agreed
9	Saves the students time of cueing on the line for admission and course registration	3.58	1.80	Agreed	3.28	1.33	Agreed
10	Saves the time of going to library to search for information	2.86	1.37	Agreed	2.72	1.31	Agreed
11	Students access current information online with ease	3.10	1.47	Agreed	3.74	1.40	Agreed
12	Students have the opportunity to share knowledge/ ideas with other students from other universities in other parts of the world	2.75	1.33	Agreed	2.68	1.27	Agreed
13	Electronic communication devices enhance increased student engagement in class	3.10	1.47	Agreed	3.18	1.46	Agreed
14	they improve students' innovative and creative skills	3.00	1.41	Agreed	3.10	2.32	Agreed

Data from the table above shows the mean scores and standard deviation of male and female undergraduates on the benefits of the electronic communication devices to the undergraduates. Male and female undergraduates agreed on all the items with high mean scores greater than the criterion mean of 2.5. Male and female undergraduates agreed that the benefits of the electronic communication devices to the undergraduates include: Saving the students' time of cueing on the line for admission and course registration, saving the time of going to library to search for information, students accessing current information online with ease, students having the opportunity to share knowledge/ ideas with other students from other universities in other parts of the world, enhancing increased student engagement in class, and improving students' innovative and creative skills.

Research Question 3: What are the problems that inhibit the appropriate use of these electronic devices in teaching and learning in universities in Rivers State?

Table 3 shows the mean scores and standard deviation on male and female undergraduates on the problems that inhibit the appropriate use of these electronic devices in teaching and learning in universities. Male and female undergraduates responded on all the items with high mean scores greater than the criterion mean of 2.5. Male and female undergraduates agreed that the problems that inhibit the appropriate use of these electronic devices in teaching and learning in universities include: the cost of these electrical communication devices, inadequate finance to procure these facilities/use them for academic purposes, poor electricity supply in the country, lack of electrical communication skills among teachers and students, limited access to the internet, and lack of proper maintainers of the available electronic communication devices.

Table 3: Mean Scores of male and female undergraduates on the problems that inhibit the appropriate use of these electronic devices in teaching and learning in universities

S/no	Problems that inhibit the appropriate use of these electronic devices in teaching and learning	Male Undergraduates			Female Undergraduates		
		\bar{x}	SD	Decision	\bar{x}	SD	Decision
15	cost of these electrical communication devices	2.98	1.44	Agreed	2.82	1.34	Agreed
16	Inadequate finance to procure these facilities/use them for academic purposes	3.58	1.80	Agreed	2.72	1.31	Agreed
17	Poor electricity supply in the country	3.38	1.39	Agreed	3.25	1.37	Agreed
18	Lack of electrical communication skills among teachers and students	3.23	1.36	Agreed	3.43	1.35	Agreed
19	Limited access to the Internet	3.57	1.46	Agreed	3.04	1.31	Agreed
20	Lack of proper maintenance of the available electronic communication devices	2.78	1.22	Agreed	3.03	1.30	Agreed

2.2 Test of Hypotheses

Hypothesis 1: There is no significant difference between the mean scores of male and female undergraduates on the extent they adopt e-learning devices in their studies.

Table 4: Mean Score Difference between the mean ratings of male and female undergraduates on the extent they adopt e-learning devices in their studies

Sex of Undergraduates	N	\bar{X}	δ	p-value	df	Critical value	t-calculated	Remarks
Male	95	2.68	1.40	0.05	203	± 2.00	1.82	Accepted
Female	110	2.60	1.34					

The result shows that there is no significant difference between the mean ratings of male and female undergraduates of University of Port Harcourt on the extent they adopt e-learning devices in their studies. This is evidenced from the fact that the t-calculated value of 1.82 is less than the critical value of ± 2.00 of 203 degree of freedom at an alpha significant level of 0.05. Hence, the null hypothesis is accepted. Thus, there is no significant difference between the mean ratings of male and female undergraduates of University of Port Harcourt on the extent they adopt e-learning devices in their studies.

Hypothesis 2: There is no significant difference between the mean scores of male and female undergraduates on the benefits they derive from the use of electronic communication devices in their studies.

The result shows that there is no significant difference between the mean ratings of male and female undergraduates of Uniport on the benefits they derive from the use of electronic communication devices in their studies. This is evidenced from the fact that the t-calculated value of 1.56 is less than the critical value of ± 2.00 of 198 degree of freedom at an alpha significant level of 0.05. Hence, the null hypothesis is accepted. Thus, there is no

significant difference between the mean ratings of male and female undergraduates of Uniport on the benefits they derive from the use of electronic communication devices in their studies.

Table 5: t-test Analysis of Difference between the Mean ratings of male and female undergraduates on the benefits they derive from the use of electronic communication devices in their studies.

Sex of Undergraduates	N	\bar{X}	SD	df	t-calculated	Critical value	Decision
Male	95	2.88	1.43	203	1.56	±2.00	Accepted
Female	110	2.90	1.32				

Hypothesis 3: There is no significant difference between the mean scores of male and female undergraduates on the problems that inhibit the appropriate use of these electronic devices in teaching and learning in universities in Rivers State.

The result shows that there is no significant difference between the mean ratings of male and female undergraduates of Uniport on the problems that inhibit the appropriate use of these electronic devices in teaching and learning in universities in Rivers State. This is evidenced from the fact that the t-calculated value of 1.46 is less than the t-critical value of ±2.00 of 203 degree of freedom at an alpha significant level of 0.05. Hence, the null hypothesis is accepted. Their usage level of electronic devices in teaching and learning is very low. Thus, there is no significant difference between the mean ratings of male and female undergraduates of Uniport on the problems that inhibit the appropriate use of these electronic devices in teaching and learning in universities in Rivers State.

Table 6: t-test Analysis of Difference between the mean ratings of male and female undergraduates on the problems that inhibit the appropriate use of these electronic devices in teaching and learning in universities

Sex	N	\bar{X}	SD	df	t-calculated	Critical value	Decision
Male	95	2.29	1.30	203	1.46	±2.00	Accepted
Female	110	1.88	1.11				

3. DISCUSSION

The study revealed that the male and female undergraduates responded high on the extent undergraduates adopt the e-learning devices in their studies includes: sharing of knowledge/information through E-learning facilities, use of Internet to source for learning materials, submission of assignments through e-mails, the use of CDs/VCDs for storing and retrieving learning materials/data, using the web services to source information and fill academic forms, the use of computers for storing and retrieving learning materials, and the use of video camera in covering laboratory experiments and field trips. Lei and Zhao (2007) stated how each technology is likely to play a different role in students' learning and it is clear that we need to think about what kind of technologies are being used in the classroom, and for what purposes.

The idea that teaching and learning can successfully take place through the application of electronic communication facilities between teachers and students is one which had generated, hope and excitement. The test of hypothesis one showed that there is no significant difference between the mean ratings of male and female undergraduates of University of Port

Harcourt on the extent they adopt e-learning devices in their studies. The UNESCO (2008) ICT competency standards for teachers go further, describing three approaches: technological literacy, knowledge deepening, and knowledge creation. These approaches are seen as part of a development continuum, and each approach has different implications for education reform and improvement, plus different implications for changes in the components of the education system: Pedagogy, teacher practice and professional development, curriculum and assessment, and school organisation and administration.

The study also revealed that male and female undergraduates agreed on the benefits of the electronic communication devices to the undergraduates include: Saving the students' time of queuing on the line for admission and course registration, saving the time of going to library to search for information, students accessing current information online with ease, students having the opportunity to share knowledge/ ideas with other students from other universities in other parts of the world, enhancing increased student engagement in class, and improving students' innovative and creative skills. This agrees with the findings of Nwabueze and Obaro (2011); Suraya, Shanton and Sherah, (2009) that electronic communication device enhances increased student engagement in class, active learning, group work, process continuity, higher level of learning, information sharing and exchange and innovative and creativity skills. This allows for increased accessibility to the information relevant to the course provide for a more pedagogically sound interaction with the information by students, encourage more thoughtful discussion by students about the information in the class, provide more equal participation in classroom discussion, enhance student interaction outside the class, provide a unique classroom assessment technique, enhance ability to archive and retrieve students' work, and provide increased structure of information/ sources of information. The test of hypothesis two showed that there is no significant difference between the mean ratings of male and female undergraduates of Uniport on the benefits they derive from the use of electronic communication devices in their studies. However, electronic communication devices help students to develop interpersonal skills (Slavin 1997) such as: getting to know and trust team members; communicating effectively and clearly; providing support and challenging fellow team members; and engaging in constructive conflict resolution (Johnson & Johnson 2000). In addition, these social skills may help students to acquire a sense of social responsibility

The study concludes that the problems inhibiting the appropriate use of these electronic devices in teaching and learning in universities include: the cost of these electrical communication devices, inadequate finance to procure these facilities/use them for academic purposes, poor electricity supply in the country, lack of electrical communication skills among teachers and students, limited access to the internet, and lack of proper maintainers of the available electronic communication devices. This agrees with the findings of Nwabueze (2011) that the problems inhibiting the appropriate use of these electronic devices in teaching and learning in universities include poor information infrastructure, inadequate ICT facilities in schools, frequent electric interruption, inadequate manpower in schools, poor project implementation strategy, limited school budget, high cost of ICT facilities, lack of maintenance culture, and poor perception of ICTs among teachers. The test of hypothesis three showed that there is no significant difference between the mean ratings of male and female undergraduates of Uniport on the problems that inhibit the appropriate use of these electronic devices in teaching and learning in universities in Rivers State. Therefore, both male and females agreed to the problems that inhibit the appropriate use of these electronic devices in teaching and learning in universities test in hypothesis three.

4. CONCLUSION

Electronic communication is the newest medium for the transfer of information. Its usage has been on a steady increase for the past five years to the point where it is in many cases, the chief means of interaction between people. It is particularly prevalent among the younger members of the society. The new generation has openly embraced this new form of communication at an unprecedented rate.

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