

ATTITUDE OF LECTURERS TOWARDS INTEGRATION OF INFORMATION AND COMMUNICATION TECHNOLOGY (ICT) INTO TEACHING AND RESEARCH IN HIGHER INSTITUTIONS

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Abstract

The study surveyed the attitude of lecturers towards integration of Information and Communication Technology (ICT) in tertiary institutions in Niger State. To elicit responses for the study, four research hypotheses were formulated. One hundred and fifty lecturers, 90 males and 60 females were randomly drawn from three federal tertiary institutions in Niger State. Data was collected for the study through the administration of 29 - item questionnaire. A test re-test method was used to determine the reliability of the instrument, 0.85 value was recorded using cron batch alpha. The data obtained were analysed using t-test and ANOVA to test the hypotheses. The findings showed that male lecturers had positive attitudes towards integration of ICT into teaching and research in tertiary institutions than female counterparts. Science oriented lecturers' attitudes toward integration of ICT in tertiary institution are higher than non-science oriented lecturers. Less experienced lecturers are more exposed to the use of ICT than moderately and highly experienced lecturers. University lecturers acquired more ICT skills than their counterparts in polytechnics and colleges of education. Many lecturers lacked adequate training and competence in using computer as a tool for effective teaching and research purpose. Base on the findings, it was recommended that: lecturers should be encouraged to be computer literate through organising conferences, seminars and workshops; computer literacy should be a priority to employ lecturers into teaching profession; lecturers should be encouraged to develop good attitudes toward the use of ICT for teaching and research work.

Keywords: *Information and Communication Technology (ICT); Attitude; Experience; Skills; Gender; Area of Discipline; and ICT facilities*

Introduction

The need for the development of ICT is a global resolution and has been a subject of great significance to all mankind (Olaofe, 2005). Information and communication technology is a shorthand for the computers, software, networks, satellite links and related systems that allow people to access, analyse, create, exchange and use data, information, and knowledge in ways that were almost imaginable (Association of African Universities, 2000).

There are various ways of using ICT for teaching and learning in tertiary institutions. For instance, the use of computer assisted learning (CAL) is the interaction between a student and computer system designed to help the students to learn. Also, computer assisted research is used as an aid to doing library and empirical research. This is enhanced through the growth of World Wide Web which has created virtual library that can only be accessed by the technologically literate. Similarly,

distance learning make use of telecommunications designed to facilitate students' learning through e-mail, interactive web sites and two-way audio/video teleconferencing (Yusuf & Onasanya, 2004). Furthermore, the use of ICT increase the time learners devote to learning, enhance the speed of availability of data and information, provide immediate feedback, assist less qualified teachers, and increase teachers efficiency and effectiveness (Abimbade, 1998). In spite of importance of ICT to lecturers, the full potentials of ICT in assisting or managing instruction are yet to be exploited.

Lecturers, the implementer of innovation and instruction are important in the quest for successful implementation of ICT in education in Nigerian tertiary institutions. Their knowledge and attitude may be critical to the success or otherwise of any ICT in education programme (Yusuf 1998). As Elkin (1985) had posited, the ultimate decision to use or not to use the computer lies with the teachers, their attitudes in a learning environment, therefore, are critical if computer education is to be successfully implemented. Attitude is a disposition behaviour in a given situation context. Attitude can be affective, cognitive or behavioural. The affective dimension consists of an individual's evaluation of liking of or emotional response to some object or person. The cognition is viewed as the individual's beliefs about, or factual knowledge of, the object or person. The behavioural involves the overt behaviour of an individual directed towards the object. or person (Yusuf, 1998). Attitudes control the actual behaviour of an individual, consciously and unconsciously. In fact, successful implementation of computer education is dependent on students' acceptance which is assumed to be affected to a large extent by teachers' attitudes toward computer (Koohang, 1987). That is, there are links and affinities between teachers positive attitudes towards computer/computer education and students acceptance and success in any computer education programme.

Hogarty and Kramer (2000) and Agbatogun (2006) found that gender and academic qualifications of teachers do not affect teachers' attitude towards the teaching and learning of computer science in schools. However, both male and female teachers normally exercise fear of failure in implementing any new idea or phenomenon. Yusuf (1998) found that secondary school teachers have positive attitudes towards the feelings about computer, computer in education and learning about computer. However, male teachers showed greater positive attitudes towards computer than female teachers.

.Agbatogun (2006) discovered that younger teachers are more amiable to new challenges than the older teachers. He concluded that with global technological wave that is affecting every sector and every aspect of life teachers whether male or female, experienced or inexperienced, humanities, science or vocationally oriented need to struggle zealously to be computer literate in order to face the present educational challenges.

The researches that dealt specifically with tertiary institutions lecturers' attitudes towards ICT integration in Nigeria are very scanty. Thus, it is essential for a research on lecturers' attitude towards ICT in education to be carried out. Therefore, this research addresses the attitudes of lecturers towards the use of ICT facilities and equipment in Nigerian tertiary institutions. It also examined the level of skills acquisition, influence of gender and, area of specializations on lecturers' attitudes towards ICT.

Research Questions

The study specifically sought answers to the following research questions:

- (i) Is there any difference between male and female lecturers' attitude towards integration of ICT into classroom teaching and research work?
- (ii) Is there any difference between science and non - science related lecturers' willingness to use ICT facilities for teaching and learning in tertiary institutions?
- (iii) Is there any difference between less experienced, moderately experienced and highly experienced lecturers' competence in the use of ICT for teaching and research at university, polytechnics and colleges of education?
- (iv) Is there any difference between lecturers in the federal universities, polytechnics and colleges of education level of computer skills in the use of ICT for teaching and research work?

Research Hypotheses

The following hypotheses were formulated from the research questions and tested at 0.05 level of significant:

- (i) There is no significant difference between male and female lecturers' attitude towards integration of ICT into classroom teaching and research work.
- (ii) There is no significant difference between science and non-science related lecturers willingness to use ICT facilities for teaching and learning in tertiary institutions.
- (iii) There is no significant difference between less experienced, moderately experienced and highly experienced lecturers' competence in the use of ICT for teaching and research at university, polytechnics and colleges of education.
- (iv) There is no significant difference between lecturers in the federal universities, polytechnics and colleges of education level of computer skills in the use of ICT for teaching and research work.

Sample and Sampling Techniques

The research subjects were 150 tertiary institutions lecturers drawn from three federal government tertiary institutions in Niger State. These institutions were selected because they were better equipped and staffed than most the state government owned public schools and they have computer laboratories with internet. Also, these institutions offer computers as a subject at their various institutions. Among the participants, 90 were males, while 60 were females. They cut across all the departments within the institutions, giving a total of 150 lecturers. Among the 150 lecturers 50 whose teaching experience was less than 7 years were treated as less experienced, 50 whose teaching experience was less than 16 years were treated as moderately experience, while 50 who had more than 16 years and above were treated as highly experienced lecturers. 90 Science and technology related discipline lecturers and 60 arts related discipline lecturers participated in the study, giving a total of one hundred and fifty (150) lecturers.

Research Instrument

The instrument used for this study was a researcher designed 40 - item "Computer Attitude Scale". The questionnaire consisted of two major sections (A and B). Section A dealt with demographic data (lecturer's gender, educational qualification, institutions, years of experience, subject specialization, type of institution, etc.) while Section B contained four sub-scales. These sub-scales were: Attitudes of male and female lecturers towards computer (10 items); Attitudes of lecturers towards the use of ICT for teaching and research based on discipline (10 items); the attitudes of lecturers towards the use of ICT based on experience (10 items), the level of ICT skills acquired by lecturers in tertiary institutions (10 items). A four point Likert type response (Strongly Agree, Agree, Disagree and Strongly Disagree) was used. In other to validate the instrument, the questionnaire was given to a computer educationist and two educational technologists to critically look at the face and content validity. The questionnaire was pilot tested once for reliability, and this was determined by internal consistency using alpha co-efficient. The coefficient reliability for the sub-scales in Section B was 0.84; 0.89; 0.90 and 0.94 for Attitudes of male and female lecturers towards computer; Attitudes of lecturers towards the use of ICT for teaching and research based on discipline; the attitudes of lecturers towards the use of ICT based on experience, the level of ICT skills acquired by lecturers in tertiary institutions respectively.

Research Procedure

The researcher visited the institutions and two lecturers were chosen as research assistants from each institution. The questionnaire was administered on the first visit to the lecturers across the departments. At second visit, the questionnaire was collected from the research assistants. 10-questionnaires mortality was discovered out of 160 questionnaires prepared for the research. After responses had been collated, they were sorted into different groups according to the research

hypotheses stated above. A questionnaire was not considered for analysis if it was not well completed (omission of items) and if the respondent gave contradictory information evidence that he/she did not understand the demand of some questions or was not honest in his response. Inferential statistics were used to analyze the data. T-test and one-way ANOVA were used to assess differences between groups of lecturers. To establish the area of differences, scheffe's pos hoc test was used. Analyses were conducted at 0.05 level of significance.

Results and Discussion

Hypothesis 1: There is no significant difference between male and female lecturers' attitude towards the use of ICT for teaching and research in tertiary institution.

Table 1: t-test comparison of attitudes of male and female lecturers towards the use of ICT facilities and equipment for teaching and research in tertiary institutions

Variable	No in paired sample	df	Mean (X)	SD	t-value Calculated	Significance Level
Male Lecturers	90	148	2.15	0.69	7.18*	0.002
Females Lecturers	60		2.89	0.49		

*significant at 0.05 level of significance

Table 1 shows the t-test comparison of the males and females lecturer's attitudes towards the use of ICT facilities/equipment for teaching and research work. The table, revealed that ($t_{crit} = 7.18$, $df = 148$, $p < 0.05$). The result was significant at 0.05 alpha level. This hypothesis is therefore rejected. This indicates that male lecturers had positive attitudes towards the use of ICT for teaching and research in tertiary institutions than female lecturers.

Hypothesis 2: There is no significant difference between science oriented lecturers and Non-science oriented lecturers on the attitudes towards the use of ICT facilities/equipment for teaching and research in tertiary institutions.

Table 2: t-test comparison of attitudes of science and non-science oriented lecturers towards the use of ICT facilities and equipment for teaching and research in tertiary institutions

Variable	No in paired sample	df	Mean (X)	SD	t-value Calculated	Significance Level
Science Lecturers	90	148	2.15	0.33	6.73*	0.073
Non-Science Lecturers	60		2.51	0.29		

*significant at $p > 0.05$ level of significance

An examination of Table 2 revealed that ($t_{crit} = 6.73$, $df = 148$, $p > 0.05$) was significant. This implies that there is significant difference in the scores of science lecturers and non-science oriented lecturers at 0.05 alpha level. Therefore, hypothesis two is rejected. This indicates that science oriented lecturers had better attitudes towards the use of ICT for facilities and equipment for teaching and research in tertiary institutions than non-science oriented lecturers.

Table 3: ANOVA comparison of the attitudes of less experienced, moderately experienced and highly experienced lecturers towards the use of ICT facilities and equipment for teaching and research in tertiary institutions

Source of variable	Sum of Squares	df	Mean Square	F – Value	P-value
Between Groups	46.81	2	23.40	237.29*	0.000
Within Groups	14.49	147	0.09		
Total	61.30	149			

*significant at $P < 0.05$ level

The result of the analysis in Table 3 indicates that an $F(2,147) = 237.29$, $p = 0.000$ was significant at 0.05 alpha level. This indicates that there was significant difference in the attitudes of the highly experienced, moderately experienced, and low experienced lecturers attitudes towards the use of ICT facilities and equipment for teaching and research in tertiary institutions.

As a result of the establishment of a significant difference, a post-hoc test using Scheffe analysis was conducted to determine the direction of difference among the three level of experiences. The result of the Scheffe's test is as shown in Table 4.

Table 4: Scheffe's post hoc test on the three tertiary institutions

Variable (i)	Experience (j)	Mean difference (i-j)	P-value
Less Experienced	Moderately Experienced	0.972*	0.000
	Highly Experienced	1.320*	0.000
Moderately Experienced	Less Experienced	0.972*	0.000
	Highly Experienced	0.348*	0.000
Highly Experienced	Less Experienced	1.320*	0.000
	Moderately Experienced	0.348*	0.000

Table 4, indicates that there was significant difference between the less experienced, moderately experienced and highly experienced lecturers attitudes. Therefore, the less experienced lecturers' attitudes towards the integration of ICT facilities and equipment into teaching and research work is higher than moderately experienced and high experienced respectively. Therefore, hypothesis three was rejected.

Table 5: ANOVA comparison of the ICT skills acquisition in the use of ICT between lecturers in the university, polytechnics and colleges of education

Source of variable	Sum of Squares	df	Mean Squares	F – Value Calculated	P-value
Between Groups	46.805	2	23.402	237.29*	0.000
Within Groups	14.498	147	0.99		
Total	61.302	149			

*significant at $P < 0.05$ level

The result of the analysis in Table 3 indicates that an $F(2,147) = 237.29$, $p = 0.000$ was significant at 0.05 alpha level. This indicates that there was significant difference in the attitudes of

the university lecturers, polytechnic lecturers and college of education lecturers' skills acquisition in the use of ICT facilities and equipment for teaching and research in tertiary institutions.

Since the existence of differences had been established, to determine the direction of the difference, then, the Scheffe's post hoc analysis was adopted to compare the mean. The result of the Scheffe's analysis is indicated in Table 6.

Table 6: Scheffe's post hoc test on the three tertiary institutions ict skills acquisition

Institutions (j)	Institutions(j)	Mean difference (i-j)	Significant Level
University Lecturers	Polytechnic Lecturers	0.972*	0.000
	College of Edu. Lecturers	1.320*	0.000
Polytechnics Lecturers	University Lecturers	0.972*	0.000
	College of Edu. Lecturers	0.348*	0.000
Colleges of Edu. Lecturers	University Lecturers	1.320*	0.000
	Polytechnics Lecturers	0.348*	0.000

Table 6, reveals that there was significant difference between university, polytechnics and colleges of education lecturers' ICTs skills acquisition level for teaching and research work. Therefore, the university lecturers' possessed more skills in the use of ICT facilities and equipment than polytechnic and college of education lecturers respectively. Therefore, hypothesis four was rejected.

Discussion

The world is fast becoming a global village, as a result of developments in information and communication technology (ICT). The challenge of integrating information and communication technology (ICT) into tertiary institutions is a very big task. It's obvious that there is little or no usage of ICT at this level of our educational system. Most institutions do not have the necessary ICT facilities for instruction and research neither do the lecturers possess skills in ICT for effective classroom interactions. This study support the finding of Yusuf (1998) who reported that male has positive attitudes towards computer than female. The position of this study is supported by the findings of Hogarty and Kramer (2000) and Agbatogun (2006) which show that gender and academic qualifications of lecturers do not affect lecturers' attitude towards the use of ICT facilities and equipment. Science oriented lecturers are more interested in the use of ICT facilities than non science oriented lecturers. The level of competences and skills acquisition of colleges of education and polytechnics lecturers in the use of ICT facilities and equipment is worrisome.

Major Findings of the Study

- (i) Gender had effect on lecturers' attitudes towards the use ICT facilities/equipment in tertiary institutions in favour of male.
- (ii) Science subject lecturers are more interested in the use of ICT facilities/equipment for teaching and research work than non-science based counterparts.
- (iii) The less experience lecturers are more dispose towards the use of ICT facilities than their senior colleagues.
- (iv) University lecturers possessed more ICT skills than Polytechnics and college of education lecturers respectively.

Conclusion

Information and communication technologies (ICTs) offer innumerable benefits in enhancing the quality and quantity of teaching and learning in tertiary institutions. Despite the prevalent nature of ICT in virtually every aspect of human endeavours, they have not been widely integrated into the teaching and learning process in schools. Their integration will not only revolutionise teaching in tertiary institutions, they will engender the development of students' innate scientific inquiry mind and their critical thinking abilities. There is need to sensitize and encourage female, non-science oriented and highly experienced lecturers towards computer literacy when this is done, the success of integration of ICT into school system is guaranteed.

Recommendations

1. The tertiary education curriculum should be reviewed to reflect more practical courses in ICT for pre-service and in-service lecturers.
2. Workshops/seminar organised specifically for the purpose of facilitating teachers' literacy, awareness and skills using ICT in teaching will greatly improve the level of integrating ICT into teaching and learning process.
3. Tertiary institutions should be well equipped with adequately functional and well-furnished computer laboratory/cyber café for lecturers and students use.
4. Computer literacy should be one of the pre-requisites for appointing lecturers into the teaching profession.
5. National University Commission, National Commission for Colleges of Education and National Board for Technical Education should provide the necessary ICT facilities and equipment in tertiary institutions.
6. Female and highly experienced lecturers should be encouraged to face the challenges of the new technologies.

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