

**LECTURERS' COMPETENCIES REQUIRED FOR EFFECTIVE TEACHING
OF COMPUTER SCIENCE COURSES IN UNIVERSITIES IN
SOUTH-SOUTH NIGERIA**

BY

**DR. ESSIEN NSEABASI P.,
FRANK, PEACE A.**

&

**FAITH BURABARI N.
COMPUTER SCIENCE EDUCATION UNIT
DEPARTMENT OF VOCATIONAL EDUCATION
FACULTY OF EDUCATION UNIVERSITY OF UYO**

ABSTRACT

The study was aimed at determining the lecturers' competencies required for effective teaching of Computer Science courses in Universities in South-South, Nigeria. Two specific purposes and their corresponding research questions and hypotheses were formulated to guide the study. The ex-post facto research design was used in the study and it was carried out in South-South Nigeria. The population of the study consisted of 901 year two Computer Science students in all the Universities offering Computer Science in South-South Nigeria. The sample for the study consisted of 270 respondents selected using a combination of stratified sampling and multi-stage sampling technique. Instruments titled "Lecturers' Competences Questionnaire containing 10 items were developed and used for data collection. The questionnaires were structured on a 5-point rating scale. The instruments were validated by three experts from the Faculty of Education, University of Uyo. The internal consistency reliability of the instruments obtained using Cronbach Alpha technique were 0.76 and 0.87 respectively for the Lecturers' Competences Questionnaire. Mean and standard deviation was used in answering the research questions while Independent t-test was used for testing the null hypotheses at .05 level of significance. The findings conclude, among others, that Information and Communication Technology (ICT) competencies were moderately required by lecturers for effective teaching of Computer Science courses. There is no significance difference in Mean response of male and female student on ICT competencies and various teaching methods required by lecturers for effective teaching of Computer Science courses in universities in South-south, Nigeria. It was concluded that lecturers' competencies have a significant impact on their teaching effectiveness in Computer Science courses. It is recommended among others, that lecturers of Computer Science course in universities should endeavour to update their competencies in various aspects of teaching, particularly the use of various ICT tools and use of various teaching methods.

**KEYWORDS: Lecturers, ICT, competencies, teaching, Computer Science courses,
Universities, South-South, Nigeria.**

Introduction

Teaching is generally viewed as the process through which teachers impart knowledge and skills to students. Ovawie (2010) viewed teaching as a systematic activity deliberately engaged in by somebody to facilitate the learning of the intended worthwhile

knowledge, skills and values by another person. Ogwo and Oranu (2006) defined teaching as a partnership enterprise between the teacher and the students which ultimately leads to permanent changes in the students' behavior. The authors explained that teaching is the science and art of assisting a person to learn. According to them, the science in teaching entails the use of acquired knowledge from natural and applied science in order to appreciate the circumstance and personality of a learner while the art aspect of teaching involves the use of creative and demonstrative skills in aiding the delivery of instruction. It is worthy to note that for teaching to achieve its objectives, it must be effective.

Onyekuru and Ibegbunam (2013) defined effective teaching as the type of teaching characterized by the exhibition of intellectual, social and emotional stability, love for children and positive disposition towards the teaching profession and ability to inspire good qualities in students. According to Oviawe (2010), effective teaching is one that produces demonstrable result in terms of cognitive, affective and psychomotor development of the students. Therefore, an effective teacher is one who does things right, attempts to solve job-related problems, avoid waste of resources and ensures quality output (Akpan, 2014). The author noted that effective teaching is a term synonymous with teaching effectiveness, hence, the two terms are used interchangeably in this study. The author further noted that teaching effectiveness depends on many factors one of which is the teacher's competence.

Okoro (2012) defined competency as the knowledge, skills and behaviours that enable an individual to meet established performance criteria. Competencies can also refer to the characteristics or abilities of an individual that enable him to perform appropriate specific actions. It represents the capability that an individual brings to the job such that when the responsibilities of the job to produce the desired results require the demonstration of specific actions, the individual draws from inner resources for the capability to respond (Nzilano, 2013). Lecturers' teaching competences therefore refer to the skills, standards, methods and capabilities required when engaged in the teaching and learning process (Ezeugbor, 2008). There are some competences that will make teachers, including Computer Science lecturers to be very effective in the discharge of their teaching duties. These competences include, among others, Information and Communication Technology competence, and competence in using various teaching methods.

Statement of the problem

It is widely acknowledged that teachers teaching competence is a strong predictor of students' quality because no educational system can rise above the quality of its teachers. In recent times, the performance of students in Computer Science courses has been declining, particularly in Universities in South-South Nigeria. It has been observed that there is low level of skills acquisition and poor application of skills to practical situations among Computer Science students and graduates from tertiary institutions, including Universities in South-South Nigeria. This situation is mostly attributed to low level of teaching competence among lecturers of Computer Science courses in some aspects of teaching such as using various ICT tools and using various teaching methods.

The poor performance of Computer Science graduate has created the impression that most Computer Science lecturers in Universities in South-South Nigeria do not have the required teaching competences, hence, the teachers seem to be ineffective in their teaching. Obviously, students taught by such lecturers would be half-baked and cannot perform well academically. In addition, students taught by such lecturers would not be able to acquire practical skills for self reliance. This situation does not augur well for the attainment of the objectives of university education in Nigeria. This problem therefore gave the impetus for this study to determine the lecturers' competencies in the use of various ICT tools, use of and

various teaching methods required for effective teaching of Computer Science courses in Universities in South-South, Nigeria.

Purpose of the Study

The main purpose of this study was to determine the lecturers' competencies required for effective teaching of Computer Science courses in universities in South-South, Nigeria. The specific objectives of the study were to determine:

1. Lecturers' Information and Communication Technology (ICT) competencies required for effective teaching of Computer Science courses in universities in South-South, Nigeria.
2. Lecturers' competencies in using various teaching methods required for effective teaching of Computer Science courses in universities in South-South, Nigeria.

Research Questions

The following research questions guided the study.

1. To what extent are Information and Communication Technology (ICT) competencies required by lecturers for effective teaching of Computer Science courses in universities in South-South, Nigeria?
2. To what extent are competences in using various teaching methods required by lecturers for effective teaching of Computer Science courses in universities in South-South, Nigeria?

Research Hypotheses

The following null hypotheses were formulated and tested at 0.05 level of significance

- H₀₁: There is no significant difference in the mean responses of male and female students on the Information and Communication Technology (ICT) competencies required by lecturers for effective teaching of Computer Science courses in universities in South-South, Nigeria
- H₀₂: There is no significant difference in the mean responses of male and female students on the competence in using various teaching methods required by lecturers for effective teaching of Computer Science courses in universities in South-South, Nigeria

Design of the Study

The researcher used ex-post facto design. This is because the events to be investigated had already occurred. In the opinion of Nworgu (2009), ex-post facto studies seek to establish what relationship exists between two or more variables. The decision to use ex-post facto design in this study is based on the fact that the variables under study are complex and do not lend themselves to experimental research method. Nworgu (2009) further noted that the ex-post facto studies seek to get at the degrees of association rather than merely trying to discover whether the effect is present or not.

Population of the Study

The population of study consisted of 901 second year Computer Science students in all the state and federal Universities offering Computer Science in South-South Geographical Zone of Nigeria (Field survey, 2018). The distribution of the population according to universities is shown in Appendix 1

Sample and Sampling Technique

The sample for the study consisted of 270 year two Computer Science students. The sample size was determined using Krejice and Morgan's (1970) sampling model. The sample was selected using a combination of stratified sampling and multi-stage sampling technique. The population was first stratified into federal and state universities. Then three federal and three state universities were randomly selected. Thereafter, 45 students were randomly selected from each of the six universities.

Instrumentation

A researcher developed instrument titled "Questionnaire on Lecturers' Competencies Required for Effective Teaching of Computer Science Courses in Universities in South South Nigeria" was developed and used for data collection. The questionnaire contained 10 items meant for determining the competences required for effective teaching by Computer Science lecturers in the areas of classroom management, ICT, lesson presentation, use of various teaching methods and students' assessment competences. The respondents were required to tick under the column that best indicate the extent which they think each competency was required by their Computer Science lecturer(s) for effective teaching. It was based on the following scale: Very Highly Required (5 points); highly required (4 points); moderately required (3 points); lowlyrequired (2 point) and Very lowly required (1 point)

Validation of Research Instruments

The research instrument was given to three experts in the Department of Vocational Education for face validation. These experts were requested to read through the instruments item by item, make corrections where necessary and indicate the suitability of the items for answering the research questions. Their comments, suggestions and corrections were utilized in making adjustments and modification of the final copy of the instrument.

Reliability of the Instruments

A pre-testing of the instrument was done. The instrument was administered on 30 respondents who were not part of the sample but from the population of the study. The resulting data was subjected to Cronbach's Alpha analysis. A reliability coefficient of 0.79 was obtained. This high index indicated that the instrument was reliable for use in the study.

Method of Data Collection

The researcher obtained a letter of introduction from the Head of Department to the university authorities selected for the study. The researcher enlisted the services of three trained research assistants in administering the instruments to the 270 year two Computer Science students randomly selected from the six universities by hand. All the copies of the questionnaire administered were correctly completed and returned. This represented 100% return rate.

Method of Data Analysis

Mean and standard deviation was used for answering the research questions while the independent t-test was used for testing the null hypotheses at 0.05 levels of significance. This statistical tool was used because it would enable the researcher to determine the various competencies/skills that were required by lecturers for effective teaching of Computer Science courses in Universities in South South Nigeria.

Result

Research Question 1

To what extent are Information and Communication Technology (ICT) competencies required by lecturers for effective teaching of Computer Science courses in Universities in South-South, Nigeria?

The data for answering research question 1 is presented in Table 1.

Table 1: Mean responses on the Information and Communication Technology (ICT) competencies required by lecturers for effective teaching of Computer Science courses in universities in South-South, Nigeria (n = 270)

S/N	Information and Communication Technology Competencies	X	SD	Rem
1	Ability to use internet technologies to teach Computer Science courses.	2.89	0.79	MR
2	Ability to use e-mail for submission of students' assignments in computer science courses.	2.67	0.57	MR
3	Ability to use online video sites to teach computer science courses.	2.637	0.62	MR
4	Ability to use social media networks for teaching Computer Science courses.	2.41	0.58	MR
5	Ability to use online data bases for downloading course materials for computer science courses.	2.76	0.79	MR
	Cluster Mean	2.67	0.25	MR

*MR = Moderately Required

The result presented in Table 1 shows that the mean responses on all the five items as well as the cluster mean fell within the range of 2.50 and 3.49. This result indicate that majority of the students agreed that all the Information and Communication Technology (ICT) competencies are moderately required by lecturers for effective teaching of Computer Science courses in Universities in South-South, Nigeria.

Research Question 2

To what extent are competences in using various teaching methods required by lecturers for effective teaching of Computer Science courses in Universities in South-South, Nigeria?

The data for answering research question 2 is presented in Table 2.

Table 2. Mean responses on the competencies in using various teaching methods required by lecturers for effective teaching of Computer Science courses in Universities in South-South, Nigeria(n = 270)

S/N	Competencies in Using Various Teaching Methods	X	SD	Rem
1	Ability to use constructivist teaching methods like scaffolding and problem-solving to teach Computer Science courses	2.94	0.79	MR
2	Ability to use innovative teaching methods such as buzz group, brainstorming, etc to teach Computer Science courses.	2.79	0.66	MR
3	Ability to use student-centre methods such as reciprocal peer tutoring and edutainment to teach computer science courses.	2.56	0.62	MR
4	Ability to use student-interactive approaches such as peer tutoring, jigsaw and collaborative learning to teach computer science courses.	2.82	0.79	MR
5	Ability to use computer-based methods such as flipped classroom and multi-media to teach Computer Science courses.	2.67	0.68	MR
	Cluster Mean	2.76	0.31	MR

***MR = Moderately Required**

The data in Table 2 shows the mean responses of students on the competencies in using various teaching methods required by lecturers for effective teaching of Computer Science courses in Universities in South-South, Nigeria. As indicated, the mean responses on all the five items as well as the cluster mean fell within the range of 2.50 and 3.49. This indicate that majority of the students agreed that all the competencies in using various teaching methods are moderately required by lecturers for effective teaching of Computer Science courses in Universities in South-South, Nigeria.

Table 3: t-test analysis of the Mean responses of male and female students on the Information and Communication Technology (ICT) competencies required by lecturers for effective teaching of Computer Science courses in Universities in South-South, Nigeria (n1 = 143; n2= 127)

S/N	Information and Communication Technology Competencies	X ₁	X ₂	T	p	Dec
1	Ability to use internet technologies to teach Computer Science courses.	2.92	2.86	0.60	0.55	NS
2	Ability to use e-mail for submission of students' assignments in computer science courses.	2.55	2.82	-1.04	0.09	NS
3	Ability to use online video sites to teach computer science courses.	2.72	2.54	2.37	0.10	NS
4	Ability to use social media networks for teaching Computer Science courses.	2.67	2.13	1.66	0.20	NS
5	Ability to use online data bases for downloading course materials for computer science courses.	2.56	2.98	-1.45	0.09	NS
	Cluster Mean	2.68	2.66	0.58	0.56	NS

Note: NS = Not Significant at 0.05 level of significance

The summary of t-test analysis of the mean responses of male and female students on the Information and Communication Technology (ICT) competencies required by lecturers for effective teaching of Computer Science courses in Universities in South-South, Nigeria presented in Table 4.6 shows that the observed level of significance for all the five listed

items are greater than the stipulated probability level of 0.05. On this basis, the null hypothesis is retained signifying that there is no significant difference between the opinions of male and female students on the Information and Communication Technology (ICT) competencies required by lecturers for effective teaching of Computer Science courses in Universities in South-South, Nigeria

Research Hypothesis 2

There is no significant difference in the mean responses of male and female students on the competencies in using various teaching methods required by lecturers for effective teaching of Computer Science courses in Universities in South-South, Nigeria

The data relating to this hypothesis is presented in Table 4

Table 4: t-test analysis of the Mean responses of male and female students on the competence in using various teaching methods required by lecturers for effective teaching of Computer Science courses in Universities in South-South, Nigeria ($n_1 = 143$; $n_2 = 127$)

S/N	Competencies in Using Various Teaching Methods	X1	X2	T	P	Dec
1	Ability to use constructivist teaching methods like scaffolding and problem-solving to teach Computer Science courses	2.93	2.96	-0.32	0.75	NS
2	Ability to use innovative teaching methods such as buzz group, brainstorming, etc to teach Computer Science courses.	2.63	2.98	-1.48	0.00	S
3	Ability to use student-centre methods such as reciprocal peer tutoring and edutainment to teach computer science courses.	2.55	2.57	-0.28	0.78	NS
4	Ability to use student-interactive approaches such as peer tutoring, jigsaw and collaborative learning to teach computer science courses.	2.82	2.83	-0.08	0.93	NS
5	Ability to use computer-based methods such as flipped classroom and multi-media to teach Computer Science courses.	2.68	2.70	-0.27	0.78	NS
	Cluster Mean	2.72	2.80	-2.31	0.22	NS

Note: NS = Not Significant at 0.05 level of significance

The summary of t-test analysis of the mean responses of male and female students on the competencies in using various teaching methods required by lecturers for effective teaching of Computer Science courses in Universities in South-South, Nigeria presented in Table 4.7 shows that the observed level of significance for four out of the five listed items are greater than the stipulated probability level of 0.05 while one item has a p-value less than 0.05. This result indicates that there is no significant difference between the opinions of male and female students on the four items whereas there is a significant difference between their opinions on one item. On this basis, the null hypothesis is retained signifying that there is no significant difference in the mean responses of male and female students on the competencies in using various teaching methods required by lecturers for effective teaching of Computer Science courses in Universities in South-South, Nigeria

Findings of the Study

Based on the data collected and analyzed in the study, the following findings were made with respect to the research questions and hypotheses that guided the study:

1. There is no significant difference in the mean responses of male and female students on the Information and Communication Technology (ICT) competencies required by lecturers for effective teaching of Computer Science courses in Universities in South-South, Nigeria
2. There is no significant difference in the mean responses of male and female students on the competencies in using various teaching methods required by lecturers for effective teaching of Computer Science courses in Universities in South-South, Nigeria

Discussion of Findings

The findings that have emerged from this study are discussed in this section. The discussion is organized under sub-headings that correspond to the major variables in the research questions and hypotheses of the study.

Lecturers Information and Communication Technology Competencies required for Effective teaching of Computer Science Courses in Universities

The analysis of the responses to research question 1 presented in Table 1 revealed that. Five Information and Communication Technology (ICT) competencies are moderately required by lecturers for effective teaching of Computer Science courses in Universities in South-South, Nigeria. Testing of the corresponding null hypothesis revealed that the null hypothesis was rejected implying that there was no significant difference in the mean responses of male and female students on information communication technology competencies required by lecturers for effective teaching of Computer Science courses in universities in South-South, Nigeria. This finding is not contrary to expectation because it is a well-known fact that Information and Communication Technology competence is very essential for effective teaching in today's highly digitalized world. This finding underscores the importance of Information and Communication Technology competence for lecturers as it would enable them to use the various Information and Communication Technology tools and devices to improve their teaching of Computer Science courses.

This finding supports that of Akpan (2014) who found that the level of Information and Communication Technology (ICT) competence of lecturers significantly enhanced their job efficacy in universities in cross River State. The findings of the presents study also lend credence to the views of Selvi (2010) who noted that Information and Communication Technology (ICT) is very important to improve communication in the teaching-learning process.

Competence in using various teaching methods required by lecturers for effective teaching of Computer Science courses in Universities in South-South, Nigeria.

The study also found that five competencies in using various teaching methods were required by lecturers for effective teaching of Computer Science courses in Universities in South-South, Nigeria as indicated in its respective table. The testing of the corresponding null hypothesis revealed that the null hypothesis was rejected implying that there was no significance difference in the mean responses of male and female students on competencies in using various teaching method required by lecturers for effective teaching of Computer Science courses in universities in south-south, Nigeria. This finding is very glaring as it points out the importance of using various teaching methods during classroom instruction. Obviously, without using effective methods, lecturers would not be able to impart the needed knowledge and skills to their students which by implication means that they would not be able to achieve the objectives of the lesson.

The finding of the study that Competence in using various teaching methods required by lecturers for effective teaching of Computer Science courses in universities in South-South, Nigeria supports that of Haas (2002) who found that the teaching method used by the

teacher influence students learning to a great extent. It also supports the findings of Gulobia, Wokadala and Bategeka (2010) who found that teaching and learning strategies contribute to better school performance in Uganda. The finding further supports that of Akiri and Ugborugbo (2009) whose results showed that effective teachers produced better performing students by using effective teaching methods.

Conclusion

From the findings obtained from this study, it could be concluded that lecturers' competence have a significant impact on their teaching effectiveness in Computer Science courses, particularly in the areas of using various ICT tools and using various teaching methods. It is therefore very important that lecturers teaching Computer Science courses in universities in south-south, Nigeria should endeavour to acquire the relevant teaching competences to enable them teach effectively

Recommendations

The following recommendations were made based on the findings of this study

1. Lecturers of Computer Science courses in universities in South-south, Nigeria should endeavour to update their competence in various aspects of teaching, particularly use of various ICT tools and use of various teaching methods.
2. The National Universities Commission (NUC) in collaboration with the Teachers Registration Council of Nigeria (TRCN) should enforce the policy that only professional teachers with relevant teaching qualifications should be allowed to teach in Nigerian schools, including universities.

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