Influence of Teachers and School Factors on Use of Ict-Based Instructional Strategies in Secondary Schools in Ijebu·Ode, Ogun State, Nigeria

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Abstract

This study investigated the influence of teachers' and school factors on classroom use of ICT-based instructional strategies. A total of 240 participants randomly selected from 5 public and 3 private secondary schools in ljebu-Ode Local Government Area of Ogun State, Nigeria, participated in the study. Using an ex-post facto research design of survey type, a pre-tested teacher factor inventory (TFI), school factors inventory (SFI) and teacher use of ICT-based instructional strategies inventory (TISI) were used to elicit data on the composite and relative contribution of teachers and school factors on classroom use of ICT-based instructional strategies. The data collected were analyzed using Multiple Regression Analysis. Findings indicated that, teachers' factor (teachers' awareness, perception, readiness and ICT experience) and school factors (resources availability, ICT culture and community participation) were found to be predictors of teachers' use of ICT-based instructional strategies. The school factors predicted teacher's use of ICT-based instructional strategies more than teacher factors. Therefore, it is recommended that conscious and deliberate efforts should be made by the school, policy makers, and the government at various levels to help teachers develop positive perception towards adoption of ICT-based instructional strategies through attendance and participation in ICT-based instructional strategies adoption seminars, workshops and conferences.

Key words: Influence, ICT-based instructional strategies, teachers' factor, and school factor.

INTRODUCTION

Education can be described as a collective technique which a society employs to instruct its youths in the values and accomplishment for the civilization within which it exists. Also education is achieved through teaching and learning. Globally, there is a growing demand that educational process should be driven through technology just as it is applicable in other areas of human endeavours. This demand places high premium on effective integration of ICT-tools in and outside the classroom setting. (Tomei, 2005).

Literatures have indicated that ICT tools assist in transforming teaching and learning environment by providing relevant and abundant resources, both offline

and online that can make teaching more effective, and promote understanding and mastery on the part of the learners (Castro & Aleman, 2011; Lu, Hou & Huang, 2010). In addition, ICT tools facilitate learners' engagement with the learning materials to build new knowledge through accessing, selecting, organizing and interpretation of information. The school provides and organizes human and materials resources to achieve educational goals. Among such human resources, teachers play important and prominent roles. Teachers make use of variety of conventional teaching methods and instructional strategies to present body of knowledge to learners. The global challenges of making learning to be meaningful in order to bridge the gap between classroom practices and real world situation have made the conventional instructional strategies to be inadequate. One of the aspects of education where ICT is very useful and applicable is in its use for effective classroom teaching and learning process.

ICT-based instructional strategies can be described as integration of ICT-tools for acquisition, dissemination and utilization of information, facilitated by the use of computer and internet technology. In other words, ICT-based instructional strategies are new ways to support teaching and learning. Research findings over the past twenty years provide evidence as to the benefits and effectiveness of ICT-based instructional strategies in the classroom teaching and learning process (Brady, 2004; Jenkin, Purushotma, Clinton, Weiged & Robinson, 2006). In spite of such research efforts, government policy, investment on human and material resources, training of school administrators and teachers in ICT, classroom integration of ICT in teaching and learning process is very slow (Nut, 2010). Several surveys have been carried out to investigate factors that are related to use of ICT tools among teachers, such studies include Baek, Jung, and Kim (2008) and Egunjobi (2008), however, most of the findings are inconsistent. These unpleasant situations have widen the gaps between classroom practices and real world situation, which make students unable to think and construct their own knowledge thereby leading to students' poor achievement in school subjects. Neyland (2011) pointed to the fact that there are many influencing factors affecting innovative use of ICT in the classroom. Among several factors that could influence classroom integration of ICT-based instructional strategies; this study investigated teacher-factors (awareness, perception, readiness and ICT experience of the teachers) and school-factors (resources availability, ICT culture. and community participation).

Teacher factors are personal characteristics and disposition of teachers which influence their decision to use ICT-based instructional strategies in the classroom situation. According to Bordbar (2010), Ertner and Otternbreit (2010) teacher factors have important influence on how easily they adopt innovative use of ICT in the classroom. Such factors include: Awareness of ICT attributes for classroom use; Perception of innovative use of ICT for classroom use; Readiness to adopt ICT -based instructional strategies and ICT skills of the teachers.

Awareness refers to teachers' knowledge of the existing attributes of ICT in classroom teaching. Attributes or characteristics of an innovation as perceived by individuals in a social system affect the rate of adoption (Albirini, 2006). Teachers' perception of the attributes of computer-based strategies in the classroom refers to teachers' knowledge about the benefits of ICT-based instructional strategies in the classroom. According to Pelgrum (2001), perception is an important factor in adoption and integration of ICT-based instructional strategies.

Teachers' readiness to accept new technologies (shift from old to new strategies) is influenced by their willingness to accept the innovations. Koohang (1989) asserted that an important factor in the classroom use of computer-based technology is user's acceptance which in turn is influenced by their readiness to use the technology. The success of educational innovations depends largely on the skill and experience of teachers (Pelgrum, 2001). Furthermore, it was discovered that teachers' lack of ICT experience was one of the obstacles to the use of ICT-based instructional strategies.

School factors can be described as those variables whose availability or absence in the school can have direct influence on classroom use of ICT-based instructional strategies such as Resources availability (human and material); School ICT culture and Community participation. Human resources such as computer technicians, computer experts among others, and material resources such as computer hardwares and softwares, well-equipped computer laboratory, projectors and portable screen are essential to provide motivation and encouragement that can influence teachers to adopt ICT-based instructional strategies into classroom teaching. Bangkok (2004) supported training programme for staff. Bosley and Moon (2004), Hutchison and Reinking (2011 highlighted the importance of infrastructural facilities. School culture can be defined as the basic assumptions, norms and values and cultural artifacts that are shared by school members (Maslowski, 2001). When the use of ICT-tools is embedded in the school culture, it facilitates its integration for classroom use (Tearle, 2003). School ICT culture refers to the school tradition in using computer- based technology for administrative and academic activities in the school. For example use of e-mail and text messages to communicate with the staff and students, accessing students and important school programmes on-line through school portal. Such a tradition will provide stimulating environment for use of ICT-based instructional strategies. It is therefore necessary to find out the contributory roles of teacher factors (awareness, perception, readiness and ICT-experience) and school factors (resources availability, ICT culture and community participation) on adoption of ICT-based instructional strategies in the classroom in Ijebu-Ode Local Government Area of Ogun State, Nigeria.

Statement of the Problem

There have been extensive studies on effect of ICT-based instruction on students' learning outcomes in several school subjects with findings showing its effectiveness, however its adoption in teaching and learning was not noticeable more especially at the primary and secondary school levels of education.

In Nigeria, despite government policy, investment on human and material resources, training of school administrators and teachers in ICT, teachers still develop apathy to adoption of ICT-based instructional strategies, while there are contradictory and inconsistent reports on factors that influence its adoption. It is against this background that this study investigates the influence of teacher and school factors on adoption of ICT-based instructional strategies in Ijebu-Ode Local Government Area of Ogun State, Nigeria.

Research Questions

The followings research questions were addressed in this study.

1. What is the composite contribution of teacher-factors (Awareness, Perception, Readiness and ICT experience) on classroom use of ICT - based instructional strategies?
2. What is the relative contribution of teacher-factors (Awareness, Perception, Readiness and ICT experience) on classroom use of ICT - based instructional strategies?
3. What is the composite contribution of school factors (Resources availability, ICT culture and community participation) on classroom use of ICT- based instructional strategies?
4. What is the relative contribution of school factors (Resources availability, ICT culture and community participation) on classroom use of ICT-based instructional strategies?

Methodology

A descriptive design of survey type was adopted in this study because the existing variables were investigated with no variable manipulated. The population for the study consisted of all teachers in Junior and Senior Secondary Schools in Ijebu-Ode Local Government Area of Ogun State. A total of 240 teachers randomly selected from 8 secondary schools (5 public and 3 private schools) were also randomly selected for the study. Three instruments were used in this study. The instruments were: Teacher-Factor Inventory (TFI); School Factor Inventory (SFI) and Teacher Use of ICT-based Instructional Strategies. Altogether, the three instruments contain 33 items. The instruments have a structure, based on the 4 point likert scale ranging from Strongly Agree (SA), Agree (A), Disagree (D) and Strongly Disagree with 4, 3, 2, and 1 assigned to the positively worded items respectively

while the scoring is reversed for negatively worded items. The teachers were asked to show their responses to the options provided by ticking (√) the options which correspond to their level of agreement to the items. The instruments were validated for construct validity through peer and expert review while the reliability indices of the instruments were determined using Cronbach Alpha method and it was found to be 0.78, 0.82 and 0.75 respectively. Data collected was analyzed using multiple regression analysis. This was used to provide answers to the research questions. To research questions 1 and 3, multiple regressions determined the significance of multiple R value. To research questions 2 and 4, Beta weights (B) determined the relative contribution while B and t values were used for prediction raised in this study.

Results and Discussion of Findings

The results of this study are presented in line with the order in which the research questions were asked **Research Question 1:** What is the composite contribution of teacher-factors (Awareness, Perception, Readiness and ICT experience) on classroom use of ICT - based instructional strategies?

Table 1A and 1B show the composite contribution of the four independent variables of the teacher factors (Awareness, Perception, Readiness and IT experience)

Table 1A: Model summary of regression Analysis on Sample Data

Multiple R	.566
R square	.320
Adjusted R Square	.111
Std. Error of the Estimate	4.080

Table 1B: Analysis of Variance

	Sum of square	*Df*	*Mean square*	*F.*	*Sig. of F*	*Remark*
Regression	407.080	16	25.443	1.529	.125	NS
Residual	865.491	52	16.644			
Total	1272.572	68				

Results from Table lA indicated that the independent variables (Teacher Factors) have a multiple correlation of 0.566 with dependent variable (Classroom use of ICT -based instructional strategies). The analysis of variance (ANOVA) in Table IB indicated that the teacher factors yielded F-ratio of 1.529 which is not significant at 0.05 level of significance. This means that teacher factors, when taken together (Awareness, Perception, Readiness and ICT experience) did not make significant contribution on classroom use of ICT- based instructional strategies. This finding reveals that 11.1 % of the variation in the dependent variable is determined by the teacher factors.

Research Question 2: What is the Relative Contribution of Teacher-factors (Awareness, Perception, Readiness and ICT experience) on classroom use of ICT - based instructional strategies?

Table 2: Relative Contribution of each of the Teacher Factors on Use of IC'I' -Based Instructional Strategies

Model independent variable (predictors)	*Unstandardized coefficients*		*Standardised*	*Rank*	*T*	*Sig*	*Remarks*
	B	Std-Error	Beta				
Constant							
Awareness	_.176	.257	_.115	4th	_.684	.497	NS
Perception	.470	.216	.362	1st	2.177	.034*	S
Readiness	.299	.278	.164	2nd	1.078	.286	NS
ICT experience	.245	.275	.163	3rd	.891	.377	NS

Table 2 shows that teachers perception have significant contribution (Beta weight =.362) to classroom use of ICT-based instructional strategies while awareness, readiness and ICT skill do not have any significant contribution.

Research Question 3: What is the composite contribution of school-factors (Resources availability, ICT culture and community participation) on classroom use of ICT-based instructional strategies?

Table 3A and 3B show the composite contributions of the three independent variables of the school factors (Resources availability, ICT culture and community participation).

Table 3 A: Model Summary of Regression Analysis on sample Data

Multiple R	.525
R square	.275
Adjusted R Square	.159
Std. Error of the Estimate	2.373

Table 3B: Analysis of Variance

	Sum of square	*Df*	*Mean square*	*F.*	*Sig. of F*	*Remark*
Regression	160.518	12	13.377	2.375	.012*	Sig
Residual	422.467	75	5.633			
Total	582.982	87				

Results from Table 3A indicate that the independent variable (school factors) have a multiple correlation of 0.525 with dependent variable (classroom use of ICT-based instructional strategies). The Analysis of Variance (ANOVA) in Table 3B shows that the school factors yielded F-ratio of 2.375 which is significant at 0.05 level of significance. This means that school factors (Resources availability, ICT culture, and community participation) made significant contribution on

the dependent variable. This finding revealed that 15.9% of the variation in the dependent variable is determined by the school factor.

Research Question 4: What is the relative contribution of school-factors (Resources availability, ICT culture and community participation) on classroom use of ICT - based instructional strategies?

Table 4: Relative Contribution of each of the School Factors on Classroom use of ICT –Based Instructional Strategies

Model independent variable (predictors)	*Unstandardized coefficients*		*Standardized Coefficients Beta*	*Rank*	*T*	*Sig*	*Remarks*
	B	*Std-Error*					
Constant							
Resources Availability	.055	.020	.376	2nd	2.789	.007*	Sig
ICT Culture	_.179	.164	_.173	3rd	_1.092	.278	NS
Community participation	.599	.199	.626	1st	3.00.	.004*	Sig

In Table 4 the resources availability and community participation have significant contributions (Beta weights .626 and .376 respectively) to the dependent variable while ICT culture do not have any significant contribution.

Discussion of Findings

Results from this investigation revealed that the independent variable (Teacher factors) when taken together as shown by analysis of variance, do not make significant contribution on dependent variable. The relativity of the contributions of these variables to classroom use of ICT-based instructional strategies indicated that only teachers' perception has significant contributions. The postulation of Pelgrum (2001) is affirmed as perceptions of computer attributes and cultural perceptions indices bear significant effects on classroom use of ICT-based instructional strategies. A plausible explanation for this finding lies in the fact that most teachers do not have access to computer to be able to understand its attributes for classroom use. Mumtaz (2000) was able to identify lack of funds to obtain hardware and software as one of the reasons teachers do not use ICT-based instructional strategies in the classroom. Therefore, efficient and effective use of ICT-based instructional strategies depends on teachers' perception of computer attributes for classroom teaching through unrestricted access (Egunjobi, 2007).

The significant contribution of independent variable (school factors) when taken together on the classroom use of ICT-based instructional strategies has affirmed the findings in this area (Bangkok, 2004; Bosley and Moon, 2004). This study showed that there was significant influence of school factors (human and material resources availability, school ICT cultures and community participation) on classroom use of ICT-based instructional strategies. In addition, it was indicated in this study that community participated actively in the school programmes. According to Bosley and Moon (2004), the relativity of the contributions of school

factors on the dependent variable revealed that resources availability made greater contributions on classroom use of ICT-based instructional strategies while ICT culture of the school do not have significant contribution.

The fact that ICT culture of the school do not make significant contribution is against the assertion made by Bosley and Moon (2004) while their findings on infrastructural facilities was supported by the findings of this study. A plausible explanation for this finding is based on the fact that no single solution exists to address the immense challenges of integrating ICT into classroom use because different perspectives of integrating ICT can be chosen (Neiderhauses and Stoddart, 2001). In addition, the success of the implementation of ICT in the classroom is not dependent on the availability or absence of one individual factor, but is determined through a dynamic process involving a set of interrelated factors. The outcomes of this study also indicated that school factors (human and material resources availability) contributed more significantly than teacher factors (Teachers' perception) in integration of ICT-based instructional strategies. A plausible explanation for this is that if there were technical and personnel resources in the school; teachers would have access to computer-based facilities that would improve their perception of benefits of computer-based instructional strategies in the classroom

Conclusion

The purpose of this study was to identify the teacher and school factors which influence adoption of ICT-based instructional strategies. It was concluded that teachers' perception among other teacher factors was the major factor that influenced teachers' adoption of ICT-based instructional strategies while among the school factors, community participation and resources availability respectively contributed towards adoption of ICT-based instructional strategies, however, community participation contributed more than the other.

Recommendation

Based on the findings in this study, the following recommendations were made:
Among teacher factors that can influence teachers' adoption of ICT-based instructional strategies, teachers' perception was found to be the only significant factor that had the greatest influence on teachers. Therefore, it is recommended that conscious and deliberate efforts should be made by the school, policy makers, and the government at various levels to help teachers develop positive perception towards adoption of ICT-based instructional strategies through attendance and participation in ICT-based instructional strategies adoption seminars, workshops and conferences. In other words, teachers can be influenced to adopt ICT-based instructional strategies when they are exposed to programmes and activities that can help them develop positive perception towards it.

It was also discovered in this study that school factors (resources availability, ICT culture and community participation) when combined together had great

influence on teachers' adoption of ICT-based instructional strategies. It is therefore recommended that any institution planning to adopt ICT-based instructional strategies should make adequate provision for resources availability, ICT culture and community participation. To achieve resources availability, the community can support the school either in cash or kind through individuals, organizations, interest groups and associations. The extent to which human and non- human resources will be committed to adoption of ICT-based instructional strategies will depend on the ICT culture of the school, therefore, at the onset, the school should develop well-defined, dynamic and sustainable ICT culture that can drive instructional process to achieve the mission and vision of the school.

Finally, it is discovered in this study that when relative contribution of each of the teacher factors (resources availability, ICT culture and community participation) towards adoption of ICT-based instructional strategies among teachers was examined, community participation had the greatest influence (Beta weights=.626) while the resources availability had greater influence (Beta weights=.376). The implication of this is that adoption of ICT-based instructional strategies that is well-supported through community participation will be well-funded, sustained and facilitate resources availability. Therefore, it is recommended that any institution planning to adopt ICT-based instructional strategies should give priority attention to community participation but not neglecting provision of necessary and basic resources by the school. In other words, giving priority attention to ICT culture at the expense of community participation and resources availability will not achieve desired results in teachers' adoption of ICT-based instructional strategies.

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