

DEMOGRAPHIC VARIABLES AS DETERMINANTS OF INFORMATION AND COMMUNICATION TECHNOLOGY LITERACY AMONG SECONDARY SCHOOL TEACHERS IN EKITI STATE, NIGERIA

BY

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Abstract

This study examined ICT literacy as it related to demographic variables such as age, gender, qualification, specialisation and experience of secondary school teachers in Ekiti state. The population for the study consisted of all secondary school teachers in Ekiti State and the sample comprises of 400 teachers from 10 out of the 16 Local Government Areas in Ekiti state. Simple random sampling was used to select forty teachers from 2 schools in each local government. The validity of the instrument was ensured by experts in Social Studies, Computer Science and Educational Management. The reliability of the instrument was ascertained through test-re-test method and the reliability coefficient of 0.77 was obtained. Seven hypotheses were formulated and tested at 0.05 level of significance. The data collected were analysed using ANOVA, t-test and regression statistical tools. The study revealed that there is significant difference between ICT literacy and age, gender, experience, specialisation and qualification of secondary school teachers in Ekiti State. It was therefore recommended that government should give moral and financial supports to teachers of all ages, gender, experience, specialisation and qualifications and also organise on-the-job training, conferences and workshops on ICT to enable them incorporate ICT to teaching-learning processes for effective and efficient academic delivery in schools.

Key Words: ICT, Demographic variables, literacy, ornamental design, Information revolution.

Introduction

The world has become a global village as a result of technological advancement which enhanced easy means of communication along the globe. Information and communication Technology (ICT) is a unique and general term used for communication scheme. It is an ornamental design or application used for hardware, software, mobile and cellular phones, computer, internet, satellite network, radio, television, film projector, video recorder, tape recorder, e-mail, I-pad, overhead projector, players, slides and other communication technologies used to design, interpret, disseminate, manipulate, analyse, transmit, sending and receiving information within and outside the country. Abolade and Yusuf (2005) saw ICT as essential tools in any educational system to be used to meet learning needs of students, support equality of educational opportunities, offer high quality learning materials, increase self-efficacy, independent learning among students and enhance teacher's professional development.

ICT has contributed immensely to the rapid uplift of individuals, family and the society at large in the areas of education, knowledge updates, enlightenment effectiveness and efficiency, communication, innovation and proficiency and in all facets of life. Amadi (2014) posited that ICTs are potentially powerful tools for extending educational opportunities. Ajayi and Ekundayo (2010) agreed that ICT provides ample and exceptional opportunities to the students to develop capacities for high quality learning and ability to innovate. Audu (2005)

noted that ICT makes learning more flexible. Satharasinghe (2006) also noted that the excitement and benefits computer offers to teaching and learning is inestimable. Nyambani and Nzuki (2014) confirmed that ICT has created a turning point in educational system and it has made the whole world witness a revolution in information and communication planet.

ICT involves the ability to develop good human relation, effective information and communication skills needed to develop an individual into a well rounded person. Odey (2012) saw literacy as the ability to access and use information for functional living in the society. Knowledge of ICT by teachers is not limited to typing, sending and receiving information through computer, it also involves uploading and downloading files, browsing with the use of internet, manipulating, analyzing and interpreting information through computer. Akele (2013) noted that ICT is one of the globally acknowledged learning and teaching space today as well as one of the key propellants of globalization. Oso (2015) mentioned that computer literacy could be measured through the knowledge and ability to understand the language of computer, use it with other gadgets efficiently and effectively.

Yusuf (2005) acknowledge that ICT has the potential to accelerate, enrich and deepen the skills to motivate students to link school experience to work practices and create economic viability for tomorrow workers. Bandele (2006) stated that ICT is a super highway through which information is transmitted and shared by people all over the world. However, use of ICT with other methods of teaching will go a long way to improve the quality of teaching and learning in schools. Mangal and Mangal (2011) noted that ICT occupied a unique position in the teaching and learning of all school subjects especially those that requires logical and systematic study. Buabeng-Andoh (2012) conceded that the great capabilities of ICT in the spreading of knowledge, making education more real and the development of more efficient educational service.

According to Oyinloye (2010), ICT is a useful and veritable tool in teaching and learning especially language, but cannot be used in isolation. Babalola (2010) also agreed that ICT will assist to speed the rate of students' language perception, competence, and performance through the use of computers and other allied teaching materials. Adejoh and Ojzaji (2005) agreed that knowledge of ICT enables teachers to have privilege of being self dependent, self sufficient and professionally competent. Markauskate (2006) asserted that the introduction of computer technology into teaching and learning is a giant stride towards improving the quality of education. Olorundare (2006) contended that the importance of ICT in the classroom situation cannot be overemphasized in the provision of essential learning materials to cater for students' individual differences and guarantees unlimited access of teachers to relevant information and development in their areas of specialization.

However, the study of Okoh (2011) stressed that teachers need some skills for the integration of computer to be realizable. Roblyer and Doering (2013) submitted that software empowers teachers rather than replacing them. Oso (2015) believed that many functions of ICT provide tremendous flexibility in presentation of teaching and learning with instructional materials. Oso (2015) stressed further that ICT enables students to recall previous lessons, boost students' interest in learning, activate learners' response and provide systematic and steady feedback. As a result of the importance of ICT in schools, Okoh (2011) advocated for more meaningful use of technology in schools and integration of computer skills to be in the content areas. Onwuagboke, Singh and Fook (2015) also elucidated that ICT can empower teachers and learners, changing teaching and learning process from highly teacher-dominated to student-centered.

In the same vein, Nwalongo (2011) acknowledged that ICT are being integrated in the teaching and learning process in many schools of the world. Despite that, the success of the integration of ICT in the school system depends largely on the ability, capability and competence of teachers and their disposition towards the technology. Ofodu (2007) explained that high percentage of teachers do not have e-mail addresses and do not search internet for

educational materials to improve themselves. Ajayi and Ekundayo (2009) attributed inability of most secondary school teachers to have access to computer and use it during teaching process to financial constraint. Other factors are limited ICT facilities, lack of support, poor internet services and constant power failure in Nigeria (Ajayi 2008, Onwuagboke, et al, 2014).

In addition, Babalola, Ibitoye and Efunbajo (2002) lamented that majority of teachers in most schools lack the basic required knowledge, techniques, abilities and capabilities to use ICT for teaching and learning. Jegede (2009) also pointed out that teachers have no initial training on how to use technologies for teaching in the classroom. Olalere (2005) contended that teachers' self-concept, self-efficacy are major factors towards ICT literacy. Bingimlas (2009) believed that limited time teachers have for their lessons is a major barrier against the use of ICT for their lessons significantly. Babalola (2010) noted that limited ICT facilities in the school environment, lack or inadequate experience of teachers in the use of ICT facilities and teachers- centred traditional approach to teaching are the major problems facing ICT in Nigeria.

Statement of the Problem

Observations show that Information and communication technology is not properly integrated into the teaching and learning system in Nigeria. It has also been observed that state government in Ekiti and some other states distributed laptops to secondary school students but, most students used the computers for watching films because many teachers lack or have limited knowledge of ICT facilities which make it difficult or impossible to pass instruction through them. Most of the secondary school teachers lack computer literacy due to lack of exposure and low level of awareness of ICT (Okafor and Umoinyang 2008). This study therefore aims at investigating ICT literacy and demographic variables of secondary school teachers in Ekiti state.

Purpose of the Study

The purpose of this study is to investigate ICT literacy of secondary school teachers in relation with their demographic variables. The study will consider among other variables the age, gender, area of specialization, experience and qualification of teachers.

Research Questions

1. Will there be any difference between ICT literacy and age of secondary school teachers in Ekiti state?
2. Will there be any difference between ICT literacy and gender of secondary school teachers in Ekiti state?
3. Will there be any difference between ICT literacy and specialisation of secondary school teachers in Ekiti state?
4. Will there be any difference between ICT literacy and experience of secondary school teachers in Ekiti state?
5. Will there be any difference between ICT literacy and qualification of secondary school teachers in Ekiti state?
6. Will age and gender have joint influence on ICT literacy of secondary school teachers in Ekiti state?
7. Will qualification, teaching experience and specialisation have joint influence on ICT literacy of secondary school teachers in Ekiti state?

Research Hypotheses

H₀₁ There is no significant difference between ICT literacy and age of secondary school teachers in Ekiti state.

- Ho₂ There is no significant difference between ICT literacy and gender of secondary school teachers in Ekiti state.
- Ho₃ There is no significant difference between ICT literacy and specialisation of secondary school teachers in Ekiti state.
- Ho₄ There is no significant difference between ICT literacy and experience of secondary school teachers in Ekiti state.
- Ho₅ There is no significant difference between ICT literacy and qualification of secondary school teachers in Ekiti state.
- Ho₆ Age and gender will not significantly contribute to ICT literacy among secondary school teachers in Ekiti state.
- Ho₇ High qualification, teaching experience and specialisation will not significantly contribute to ICT literacy among secondary school teachers in Ekiti state.

Methodology

A descriptive research design of the survey type was adopted for the study. The population for the study comprised all Secondary School teachers in Ekiti state while the sample consisted of 400 teachers selected from 10 Local Governments out of 16 in Ekiti state. Simple random sampling was used to select 20 teachers each from 2 schools randomly selected from each local government. The instrument for the study is a self-designed questionnaire titled Information and Communication Technology Literacy and Demographic Variables of Secondary School Teachers Questionnaire (ICTLDVSSTQ). The validity of the instrument was ascertained by Social Studies, Educational Management and Computer Science experts. The reliability of the instrument was ensured through test-re-test method. The instrument was administered on 30 students from 2 schools that were not used for the study. After six weeks, the instrument was re-administered again on the same sets of students. The scores of the two sets were correlated using Pearson Product Moment Correlation Coefficient Analysis and the correlation coefficient of 0.77 was obtained. The data collected were analysed using ANOVA and t-test statistical tools.

Results

Hypothesis 1

There is no significant difference between ICT literacy and age of secondary school teachers in Ekiti state.

Table 1

ANOVA showing ICT literacy of Secondary School Teachers by Age

Source	SS	Df	MS	F	P
Between Group	201.74	5	40.349	2.8096*	0.014
Within Groups	8832.118	634	13.931		
Total	9033.861	639			

P<0.05

Table 1 reveals that there is significant difference between ICT literacy and age of secondary school teachers ($F_{3,636} = 2.896, P < 0.05$). The null hypothesis which states that there is no significant difference between ICT literacy and age of secondary school teachers in Ekiti state is hereby rejected. This implies that there is significant difference between ICT literacy and age of secondary school teachers. The result of Scheffe Posthoc test is presented in Table 2 below.

Table 2
Scheffe Posthoc Analysis of Age and ICT Literacy of Secondary School Teachers

Age Group	25-30	31-35	36-40	41-45	46-50	51-55	N	Mean
25-30							10	21.10
31-35			*				259	21.67
36-40							254	20.51
41-45							14	21.93
46-50							55	20.78
51-55							48	20.52

*P<0.05

Table 2 reveals that there is significant difference between ICT literacy of secondary school teachers who are between 31-35years and 36-40years age range at 0.05 level of significance.

Hypothesis 2

There is no significant difference between ICT literacy and gender of secondary school teachers in Ekiti state.

Table 3: t-test Showing ICT Literacy of Secondary School Teachers by Gender

Gender	N	Mean	SD	df	T	P
Male	275	19.97	3.01	638	6.472	0.000
Female	265	21.88	4.13			

P<0.05

Table 3 shows that there is significant difference between ICT literacy and gender of secondary school teachers ($t = 6.472, P < 0.05$). The null hypothesis which states that there is no significant difference between ICT literacy and gender of secondary school teachers is therefore rejected. This implies that there is significant difference between ICT literacy and gender of secondary school teachers.

Hypothesis 3

There is no significant difference between ICT literacy and specialization of secondary school teachers in Ekiti state.

Table 4
ANOVA Showing ICT Literacy of Secondary School Teachers by Specialisation

Source	SS	Df	MS	F	P
Between Group	831.122	3	277.041	20.875	0.000
Within Group	8440.622	636	13.271		
Total	9271.744	639			

P<0.05

Table 4 reveals that there is no significant difference between ICT literacy and specialization of secondary school teachers in Ekiti state ($F_{3,636} = 20.875, P < 0.05$). Therefore,

the null hypothesis which states that there is no significant difference between ICT literacy and specialisation of secondary school teachers in Ekiti state is rejected. However, there is significant difference between ICT literacy and specialisation of secondary school teachers in Ekiti state. The result of Scheffe Posthoc test is presented in table 5.

Table 5

Scheffe Posthoc Analysis Showing ICT Literacy of Secondary School Teachers by Specialisation

Specialisation	Education	Arts	Science	Social Science	N	Mean
Education			*		430	20.34
Arts					30	21.43
Science				*	120	23.28
Social Science					60	21.58

P<0.05

Table 5 reveals that there is no significant difference between ICT literacy of teachers who specialized in Education, Arts and Science at 0.05 level of significance. Similarly, the mean difference between ICT literacy of teachers who specialized in Science and Social Science is statistically significant at 0.05 level.

Hypothesis 4

There is no significant difference between ICT literacy and experience of secondary school teachers in Ekiti state.

Table 6

ANOVA Showing ICT Literacy of Secondary School Teachers by Experience

Source	SS	Df	MS	F	P
Between Group	482.050	6	80.342	5.947*	0.000
Within Group	8551.811	636	13.510		
Total	9033.861	639			

P<0.05

The ANOVA result in table 6 reveals that there is significant difference between ICT literacy and experience of secondary school teachers in Ekiti state ($F_{3,636}=8.947, P<0.05$). The null hypothesis which states that there is no significant difference between ICT literacy and experience of secondary school teachers in Ekiti state is rejected. Therefore, there is significant difference between ICT literacy and experience of secondary school teachers in Ekiti state. Scheffe posthoc analysis of multiple comparison of mean is presented in Table 7.

Table 7

Scheffe Posthoc Analysis of Experience and ICT Literacy of Secondary School Teachers

Teaching Experience	1-5	6-10	11-15	16-20	21-25	26-30	31-35	N	Mean
1-5		*			*			62	19.03
6-10								237	21.64
11-15								213	20.85
16-20								29	21.76
21-25								58	21.76

26-30								27	19.26
31-35								14	21.79

$P < 0.05$

The result in table 7 shows that there is significant difference between ICT literacy and secondary school teachers with 1-5years and 6-10years, 11-15years, 16-20years teaching experience at 0.05 level of significance.

Hypothesis 5

There is no significant difference between ICT literacy and qualification of secondary school teachers in Ekiti state.

Table 8

ANOVA Showing ICT Literacy of Secondary School Teachers by Qualification

Source	SS	DF	MS	F	P
Between Groups	100.231	2	50.116	3.702*	0.025
Within Groups	8622.544	637	13.536		
Total	8722.775	639			

$P < 0.05$

Table 8 revealed that there was significant difference between ICT literacy and qualification of secondary school teachers in Ekiti state ($F_{2,637}=3.702, P < 0.05$). The null hypothesis is rejected. Therefore, there is significant difference between ICT literacy and qualification of secondary school teachers in Ekiti state. The result of Scheffe Posthoc test is presented in Table 9.

Table 9

Scheffe Posthoc Analysis Showing ICT Literacy of Secondary School Teachers by Qualification

Qualification	NCE	First Degree	Masters	N	Mean
NCE		*		66	19.82
First Degree				521	21.06
Masters				53	21.38

$P < 0.05$

The result in Table 9 revealed that there was significant difference between ICT literacy of NCE and Degree holders at 0.05 level of significance. However, the mean difference between ICT usage of NCE and Master Degree holders, First Degree and Master Degree holders was not statistically significant at 0.05 level in each case.

Hypothesis 6:

Age and gender will not significantly influence ICT literacy among secondary school teachers in Ekiti state.

Table 10

Regression Analysis Showing the Contributions of Age and Gender to the teachers' ICT literacy in Ekiti state.

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig
	B	Std. Error	Beta		

(Constant)	18.753	.907		20.669	.000
Age	-.674	.250	-.104	-2.699	.007
Sex	1.883	.285	.252	6.607	.000

$P < 0.05$

Multiple R = 0.273

Multiple $R^2 = 0.074$

Adjusted $R^2 = 0.070$

F = 17.011

Table 10 revealed that age and gender significantly predicted ICT literacy among secondary school teachers in Ekiti state ($F=17.011$, $P < 0.05$). The null hypothesis is rejected. This implies that age and gender will significantly predict ICT literacy among secondary school teachers in Ekiti state. There was significant positive but low multiple correlation between age and gender and ICT literacy among secondary school teachers in Ekiti state ($r=0.273$, $P < 0.05$). The selected demographic variables (age, gender) jointly explained about 7.4% ($r^2 = 0.074$) of the total variance in ICT literacy while the remaining 92.6% unexplained variation was largely due to other factors apart from age and gender.

The regression result in the table further showed that gender was the single best predictor of ICT literacy among secondary school teachers ($\beta = 0.252$; 25.2%), closely followed by age ($\beta = 0.104$; 10.4%) among secondary school teachers in Ekiti state.

Hypothesis 7

Qualification, specialisation and teaching experience will not significantly influence ICT literacy among secondary school teachers in Ekiti state.

Table 11

Regression Analysis Showing the Influence of Qualification, Specialisation and Teaching Experience on Teachers' ICT Literacy in Ekiti state

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig
	B	Std. Error	Beta		
(Constant)	17.090	.480		35.631	.000
Qualification	.928	.130	.269	7.132	.000
Teaching experience	.042	.017	.091	2.428	.015
Specialization	.631	.149	.160	4.229	.000

$P < 0.05$

Multiple R = 0.320

Multiple $R^2 = 0.102$

Adjusted $R^2 = 0.098$

F = 24.156

Cursory look at Table 11 revealed that high qualification, teaching experience and specialisation significantly contributed to ICT literacy among secondary school teachers in Ekiti state ($F=24.156$, $P < 0.05$). The null hypothesis is rejected. This implies that high qualification, teaching experience and specialisation will significantly contribute to ICT literacy among secondary school teachers in Ekiti state. There was significant positive but low multiple correlation between the three variables and ICT literacy among secondary school teachers in Ekiti state ($r=0.320$, $P < 0.05$). The demographic variables (teachers' qualification, teaching experience and area of specialization) jointly accounted for 10.2% ($r^2 = 0.102$) of the total variance in ICT literacy while the remaining 89.8% unexplained variation was largely due to other factors other than the teachers' qualification, teaching experience and specialisation.

The regression result in the table revealed that teachers' qualification was the single best predictor of ICT literacy among secondary school teachers ($\beta = 0.269$; 26.9%), closely followed by area of specialization ($\beta = 0.160$; 16%) while teaching experience ($\beta = 0.091$, 9.1%) was the least predictor of ICT literacy among secondary school teachers in Ekiti state.

Discussion

This study discovered that age has significant influence on ICT literacy of secondary school teachers in Ekiti state. Teachers who are within the range of 25-35 have better knowledge of ICT than those who are in the range of 36-40.

It was also found out in the study that gender is significantly related to ICT literacy of secondary school teachers in Ekiti State. Sainz and Eccles (2011) also agreed with this study. They discovered that gender has no statistical significant difference on ICT literacy of teachers.

The study revealed that specialisation plays a vital role on ICT literacy of secondary school teacher in Ekiti state. This submission is in agreement with Olaoluwakolansibe (2011). He discovered that there is a significant difference in the ICT literacy level of secondary school teachers based on their subject area.

The study equally confirmed that there is significant difference between ICT literacy and experience of secondary school teachers in Ekiti State. However, the study confirmed that experience plays a significant role in ICT literacy of teachers in Ekiti state. Yusuf and Abolade (2005) agreed with the study. They discovered that ICT literacy and teachers' experience are related. They confirmed in their study that ICT enhances teacher's professional development.

The study also confirmed high qualification is significant to knowledge of ICT among secondary school teachers in Ekiti state. Sainz and Eccles (2011) and Olaoluwakolansibe (2011) agreed that high academic qualification is significant to knowledge of ICT.

Conclusion

It was concluded in this study that ICT has not been fully integrated into the teaching /learning processes in Ekiti State. It was also noted that reasonable number of teachers have little or no knowledge of ICT and as a result could not use ICT effectively to pass instructions to students in classes. The study also concluded that age, gender, specialisation, qualification, and experience splay significant roles on ICT literacy of secondary school teachers in Ekiti State.

Recommendations

1. It was therefore recommended that secondary school teachers should strife hard to move with time and upgrade their level of ICT literacy in order to improve teaching and learning in Ekiti state.
2. Principals should provide teachers with enabling environment for the use of various ICT facilities such as computer, photocopy machines, generators, radios, television, slides, projectors, players, flash drives, cameras, microphones, recorder and internet services to enhance learning and also gives room for participatory studentship.
3. Teaching Service Commission and Ministry of Education should embark on various sensitization and enlightenment programmes to create awareness for teachers on the need to be ICT literacy for proficiency, efficiency and effectiveness in their jobs and uplift of academic standard in schools and the state in general.
4. Government should organize on-the-job training, seminars, workshops, symposia and conferences at intervals for secondary schools teachers to update their knowledge on the use of ICT facilities for teaching and learning to improve students' academic performance.
5. Government should also give teachers' welfare packages a priority by giving them remuneration and encouragement both in cash and kind and also pay their salaries regularly and punctually.

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