
EFFECTS OF GENDER AND TEACHING EXPERIENCE ON IN-SERVICE TEACHERS' INFORMATION AND COMMUNICATION TECHNOLOGY LITERACY SKILL AND COMPETENCE LEVEL

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Abstract

The use of information and communication technology in the delivery of instruction for classroom teaching is gaining more attention among in-service teachers. Therefore, in-service teachers are striving towards acquiring and displaying skill in the use of ICT and consequently improving on their competence in the handling of the ICT tools. The handling of these tools are influenced by gender and teaching experience as revealed by this study. This research is a descriptive study carried out among in-service teachers in an attempt to find out the effects of gender and teaching experience on their ICT literacy skill and competence levels. Convenience sampling techniques was adopted where two hundred and eighty-three (283) in-service teachers literacy skill were sampled based on accessing, managing and integrating information, while ICT competence levels was measured through evaluating, creating and communicating information. Pearson Moment Correlation Coefficient, t-test and one way ANOVA were used to analyse data collected and collated. The result revealed that there was a significant relationship ($r = 0.950$, $p = .000$ or $p > 0.05$) that existed between literacy skill and competence levels of in-service teachers. Also, gender $\{t(11.16), p = 0.000$ (or $p < 0.05$); $t(18.01), p = 0.000$ (or $p < 0.05$)} and teaching experience $\{F(2, 280) = 159.778, p < 0.05$; $F(2, 280) = 399.006, p < 0.05\}$ had effects on the literacy skill and competence levels of in-service teachers in the use of ICT respectively.

Keywords: Gender, Teaching experience, In-Service teachers, ICT, Literacy skill

Introduction

Information and Communication Technology (ICT) is pervasive in every area of human activities. Information and Communication Technology (ICT) could refer to technological tools and resources which are employed to communicate, create, disseminate and manage information. The Federal Ministry of Education, Nigeria (2010) defines ICT as encompassing all equipment and tools (inclusive of traditional technologies of radio, video, and television to the newer technologies of computers, hardware, firm-ware, etc.), as well as the methods, practices, processes, procedures, concepts, and principles that come into play in the conduct of the information and communication activities. ICT refers to the range of technologies that are applied in the process of collecting, storing, editing, retrieving and transferring of information in various forms (Olakulehin, 2009). The availability of affordable computers and the advancement of information technology have resulted in our ability to rapidly and effectively access, retrieve, analyse, share, and store large volumes of information relevant to our daily (Masood, Khan & Waheed, 2010) activities pertinent to patient care and for learning process in a teaching hospital.

According to Poelmans, Truyen & Deslé (2009) during the learning process, students are responsible for the management of their own information processes through the use of ICT resources to evaluate, create and communicate such acquired knowledge. Every aspect of life from education, leisure, and work environment to social interactions is now being

influenced by computer technology (ICT gadget), and moreover, with the increasing use of ICT in education the world over, new skills and competencies are needed by students to be better equipped with the requisite digital literacy competencies (Idowu, Adagunodo, & Idowu, 2004). The terms "ICT competence" or "Digital competence" were taken as reference terms for different types of knowledge, skills and competencies that are needed for teachers to work with ICT in educational settings (Australian Council for Computers in Education, 2008). Competence is defined as the ability to combine and apply relevant attributes to particular tasks in particular context which encompass high attributes of high levels of knowledge, values, skill, personal dispositions, sensitivities and capabilities combined with ability to put those combinations into practice via appropriate medium (Commonwealth Department of Education, Science and Training, 2002).

All these attributes forms the ICT competence standard which devoted into ICT literacy. Markauskaite (2006) is of the opinion that ICT literacy implies knowledge of how technology is applied to information problem solving. In a broad succinct definition, the Education Testing Service (2007) highlighted the ingredients of ICT literacy to include using digital technology, communications tools, and/or networks to access, manage, integrate, evaluate and create information in order to function in a knowledge society. It is then clear from this definition that information and communication technology literacy skill requires individual's competence in the use of its resources (i.e. ICT resources) to access, manage, integrate, evaluate and create information to form a knowledge construct of learning or teaching a particular concepts. The use of ICT to access, manage and integrate information in the context of learning or teaching can be exhibited by an individual if only such user possess literacy skill on the use of ICT resources or gadget. Furthermore, the ability of such ICT users to evaluate and create information-based knowledge could only be possible if such individual can display an appreciable competence in the handling of the ICT resources to engage in the afore-stated skills.

ICT competencies play an important role in developing a nation because knowledge; skills and confidence with information and communication technology are assets for those who want to enter into the competitive employment market (Hew & Leong, 2011; Idowu, Adagunodo & Idowu, 2004). In the submission of Commonwealth of Australia (2010) competence in the use of ICT is developed when an individual use it for tasks associated with information access and management, problem solving, decision making, communicating, creative expression, and empirical reasoning. Meanwhile, scope of ICT competence is centred on the following:

- Apply appropriate social and ethical protocols and practices in managing and operating ICT.
- Applying technical knowledge and skills in managing data and information efficiently, effectively and appropriately and interacting with ICT for learning.
- Investigating, planning, refining information searches, locating and accessing different types of data and information and verifying the integrity of data when investigating questions, topics or problems.
- Creating and using ICT to generate ideas, plans, processes and products to create solutions to challenges or learning area tasks.
- Communicating and exchanging ideas or information with others through ICT while adhering to social protocols appropriate to the communicative context (purpose, audience and technology).

Also, Australian Council for Computers in Education (2008) grouped competencies into

four main categories each of them having a different emphasis ranging from:

- Technical knowledge; (ICT as a tool)
- The use of ICT for several purposes, (e.g. pedagogical, organizational, administrative) and in different (learning) environments (classroom, home, school);
- Information handling;
- Security and ethics.

These depicts the variety of knowledge, skills and attitudes with regards ICT on how to use, understand, manage and evaluate information which points to different competency levels and stages of effective and qualitative integration of ICT in the learning process.

Gender is perceived to be a set of social attributes, roles, beliefs and attitudes that define what makes a man or a woman within the society (Oghiagbephan & Asamaigo, 2010). There are a lot of researches and studies that showed the existence of significant gender differences in ICT competencies among students (Hew & Leong, 2011). As a result of gender roles assigned by different cultures, many women have been brought up to see technology and its use as reserved for on the male gender (Ikolo & Okiy, 2012). Gender equity with regard to access and use of ICTs continues to be a topical subject not only in developing countries but the world over (Tella & Mutula, 2008). Most of the current researches conducted on gender-based study, the relative difference between male and female in the use of technologies is gradually diminishing due largely to the significant growth in access and increased educational opportunities for more women, (Sorenson, 2002, Kay, 2008 & Munusamy & Ismail, 2009). ICT gadget is seen more as being masculine, hence generating some factors that discourage females in the use of information and communication technology because males are perceived to be experts (Munusamy & Ismail, 2009; Asuquo & Onasanya, 2006). However, the gender digital divide is still manifested in the low number of female users of ICTs compared to their male counterpart (Ikolo, 2010). Therefore, pre-service teachers must have the competence and the right attitude towards technology (Kadel, 2005).

Research Questions

1. Is there any significant relationship between ICT literacy skill and competence level of in-service teachers?
2. Is there any significant difference on ICT literacy skill of in-service teachers based on gender
3. Is there any significant difference on ICT competence level of in-service teachers based on gender
4. Is there any significant difference on ICT literacy skill of in-service teachers based on teaching experience
5. Is there any significant difference on ICT competence level of in-service teachers based on teaching experience

Research Hypotheses

- H_{01} : There is no significant relationship between ICT literacy skill and competence level of in-service teachers
- H_{02} : There is no significant difference on ICT literacy skill of in-service teachers based on gender
- H_{03} : There is no significant difference on ICT competence level of in-service teachers based on gender
- H_{04} : There is no significant difference on ICT literacy skill of in-service teachers based

- teaching experience
- H_{05} : There is no significant difference on ICT competence level of in-service teachers based on teaching experience

Methodology

This study assessed the ICT literacy skill and competence level of in-service teachers in Nigeria descriptively. A questionnaire of three sections was developed by the researcher, and it was subjected to validation before it was administered on the selected samples. The first section dwelled on demographic information of respondents, while the second section addressed questions on ICT literacy skill on five Likert scale of strongly agree (SA), agree (A), undecided (U), strongly disagree (SD) and disagree (D). Finally, the third section was based on competence level of the in-service teachers in the use of ICT tools on a three Likert scale of low proficiency (LP), moderate proficiency (MP) and high proficiency (HP). Convenience sampling techniques was adopted in the sample selection and the sample was made up of two hundred and eight-three in-service teachers drawn from Institute of Education of University of Ilorin.

Results

The corresponding hypotheses 1-5 for the research questions were analysed using Pearson's Moment of Correlation for H_{01} , t-test for H_{02} , H_{03} and one way ANOVA for H_{04} , H_{05} . The results are presented as follows:

- H_{01} : There is no significant relationship between ICT literacy skill and competence level of in-service teachers

Table 1: Significant Relationship between ICT Literacy Skill and Competence Levels of In-Service Teachers

		LITERACY SKILL	COMPETENCE
LITERACY SKILL	Pearson Correlation	1	.950
	Sig. (2-tailed)		.000
	N	283	283
COMPETENCE	Pearson Correlation	.950**	1
	Sig. (2-tailed)	.000	
	N	283	283

As shown in Table 1, there is a strong positive statistically significant relationship, $r = 0.950$, $p = .000$ (or $p > 0.05$), between literacy skills and competence level of in-service teachers in the use of information and communication technology (ICT). As a result, the null hypothesis is rejected.

- H_{02} : There is no significant difference on ICT literacy skill of in-service teachers based on gender.

Table 2: Significant Difference of In-Service Teachers' ICT Literacy Skill based Gender

Gender	N	X	SD	df	t-cal.	Sig. (2-tailed)
Male	82	18.5	1.04	281	11.16	.000
Female	201	37.5	15.36			

From Table 2, the study found that male in-service teachers' literacy skill had statistically positive significantly lower score (Mean= 18.5, SD = 1.04), compared to female counterpart (Mean= 37.5, SD = 15.36), $t(11.16)$, $p = 0.000$ (or $p < 0.05$). Then, the conclusion can be drawn that there is a significant difference between the female and male in-service teachers, therefore, the null hypothesis is rejected based on the fact that there is a significant difference in the mean score of male ($X=18.5$) and that of the female ($X=37.5$).

H_{03} : There is no significant difference on ICT competence level of in-service teachers based on gender

Table 3: Significant Difference of In-Service Teachers' ICT Competence Levels based on Gender

Gender	N	X	SD	df	t-cal.	Sig. (2-tailed)
Male	82	16.5	2.1	281	18.01	.000
Female	201	29.7	6.5			

From Table 3, the study found that male in-service teachers' competence level had statistically positive significantly lower score (Mean= 16.5, SD = 2.1), compared to female counterpart (Mean= 29.7, SD = 6.5), $t(18.01)$, $p = 0.000$ (or $p < 0.05$). Then, the conclusion can be drawn that there is significant difference between the female and male in-service teachers, therefore, the null hypothesis is rejected because there is significant difference in the mean score of male ($X=16.5$) and when compared to that of the female ($X=29.7$).

H_{04} : There is no significant difference on ICT literacy skill of in-service teachers based on teaching experience

Table 4: Significant Difference of In-Service Teachers' ICT Literacy Skill based on Teaching Experience

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	36387.518	2	18193.759		
Within Groups	31883.309	280	113.869	159.778	.000
Total	68270.827	282			

There was a statistically significant difference among the three categorization of teaching experience as determined by one-way ANOVA, $F(2, 280) = 159.778, p < 0.05$ for in-service teachers' literacy skills based on teaching experience. There were statistically significant differences in literacy skill of in-service teachers based on teaching experience. Scheffe's post hoc analysis was used to locate the direction of the difference among the groups as shown in Table 5;

Table 5: Scheffe's Analysis of Significant Difference of ICT Literacy Skill of In-Service Teachers based on Teaching Experience

(I) Teaching Experience	(J) Teaching Experience	Mean Difference (I-J)	Std. Error	Sig.
Less than 5years	Exactly 5years	-5.59834*	.83337	.000
	Above 5years	-17.86824*	.79633	.000
Exactly 5years	Less than 5years	5.59834*	.83337	.000
	Above 5years	-12.26990*	.54288	.000
Above 5years	Less than 5years	17.86824*	.79633	.000
	Exactly 5years	12.26990*	.54288	.000

From Table 5, it was revealed that there is a significant difference between less than 5years to above 5years and exactly 5years to above 5years teaching experience of in-service teachers in terms of their literacy skills in the use of information and communication technology.

H_{05} : There is no significant difference on ICT competence level of in-service teachers based on

Table 6: Significant Difference of In-Service Teachers' ICT Competence Levels based on Teaching Experience

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	14026.379	2	7013.190	399.006	.000
Within Groups	4921.465	280	17.577		
Total	18947.845	282			

There was a statistically significant difference among the three categorization of teaching experience as determined by one-way ANOVA, $F(2, 280) = 399.006, p < 0.05$ for in-service teachers' ICT competence levels based on teaching experience. There were statistically significant differences in competence levels of in-service teachers based on teaching experience. Scheffe's post hoc analysis was used to locate the direction of the difference

among the groups as shown in Table 7;

Table 7: Scheffe's Analysis of Significant Difference of In-Service Teachers' ICT Competence Levels based on Teaching Experience

based on Teaching Experience				
(I) Teaching Experience	(J) Teaching Experience	Mean Difference (I-J)	Std. Error	Sig.
Less than 5years	Exactly 5years	-3.24926	2.12115	.311
	Above 5years	-25.05451*	2.02687	.000
Exactly 5years	Less than 5years	3.24926	2.12115	.311
	Above 5years	-21.80525*	1.38178	.000
Above 5years	Less than 5years	25.05451*	2.02687	.000
	Exactly 5years	21.80525*	1.38178	.000

From Table 7, it was revealed that there is a significant difference among less than 5years, exactly 5years and above 5years teaching experience of in-service teachers in terms of their competence levels in the use of information and communication technology

Conclusion

This study presented empirical findings on the literacy skills and competence levels of in-service teachers in the use of information and communication technology based on gender and teaching experience. The literacy skill was assessed through accessing, managing and integrating ICT tools for sharing information, while the competence levels were determined through evaluating, creating and communicating information with ICT tools among in-service teachers. Therefore, the result showed that there is a significant relationship between literacy skill and competence levels of in-service teachers. Also, it was revealed that literacy skill of in-service teachers had influence on the competence levels on the use of information and communication technology. Therefore, gender and teaching experience have strong influence on the use information and communication technology by in-service teachers.

Recommendations

Based on the results of the analysis of the data collected and collated, the following were recommended:

1. ICT literacy skill should be encouraged among in-service teachers in order to improve on their competence level.
2. Male in-service teachers should be encouraged in stepping up their ICT literacy skill for effective communication.
3. Female in-service teachers displayed higher competence in ICT literacy skill compared to their male counterparts.
4. Teaching experience has a far reaching influence on ICT literacy skill of in-service teachers.
5. Teaching experience also determined the higher rate of its influence on competence level of in-service teachers of ICT literacy skill.

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