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Full Length Research Paper

The Link Between ICT Proficiency and Technology Adoption Attitudes Among Lecturers in Nigerian Tertiary Institutions

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The study investigates the relationship between ICT competence and attitude as well as attitudinal constructs of teachers. Four hundred and sixty seven teachers randomly selected from 10 institutions (5 universities and 5 colleges of education) participated in the study. Information bordering on ICT competence and attitude of the teachers were collected employing two research instruments. The resulting data were analyzed using multiple regressions. Findings revealed that attitude bears signi-ficant relationship with and also predicts competence. It was further obtained that two of the five attitude constructs predict competence. It was observed that as teachers perceived computers to be useful in their pedagogical enterprise, the interests become aroused which in turn help their computer skills.

Key words: Computer attitude, Competence, Relationships

INTRODUCTION

In an attempt to achieve massive computer enlightened citizenry, efforts have been made to integrate ICT into the curriculum of many nations. Japans first step in intro-ducing ICT into schools was in 1985 (Sakamoto, 1995). Mozambique launched her experimental phase in 1997 (Ismail, 2001). United Kingdom's effort in stimulating ICT integration has been since 1970 (School Curriculum and Assessment Authority, 1994). A major concern in this en-deavour has been that of teachers' willingness not only to use computers in the general sense but that of classroom application. As a result of this, ICT attitude of teachers as well as that of their competence has attracted research attention for some time.

What needs empirical verification is the relationship between computer attitude and competence. Even thou-gh attitudes in general have been accepted to impact skills and achievement (Lin et al., 2001; Wilson et al., 2000) , research results bordering on relationship bet-ween computer attitudes and competence are very scan-ty and have yielded conflicting results. For example, Her-nes et al (2001) reported that attitude does not bear stro-ng relationship with competence. Zhang and Espinosa (1997) have earlier reported that attitude predicts the need for learning computing skills which will in turn enh-ance ICT or computing skills. However research position on this relationship is lacking among Nigerian teachers.

It becomes necessary then to answer the question, what relationship exists between computer attitude and com-petence of teachers? Answer to this question would help bolster the logistics of enhancing good computer related behaviour among teachers' trainers. This is expected to translate into good computer behaviour of pre-service teachers and consequently that of primary and secondary students they will eventually teach. The study is under-pinned by observational learning theory. The conception of observational learning is that opportunity to watch and observe teacher educators teach with computer is in it a transfer of skill and behaviour and that except pre-service teachers have computer role models it will be impossible for them to integrate same into teaching.

The study has one main objective: to determine the na-ture of relationship that exists between computer attitude and competence of teachers. From this it was hypothe-sized that computer attitude will not significantly predict computer competence.

METHOD

Participants and setting

Four hundreds and sixty seven teachers selected from five colleges of education and five universities participated in the study. The selected teachers cut across all the subject discipline as well as professional status. Two research instruments were employed; the-se include Computer Competence Scale (CCOS) and Computer At-titude Scale (CAS) is a 21-item five –point Likert scale. Most of the

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Table 1. Relationship between ICT competence and attitude.

	Competence	Attitude	Attitude A	Attitude B	Attitude C	Attitude D	Attitude E
COMPETENCE	1	.663*	.393*	.503*	.595*	.611*	.396*

Table 2. Analysis of variance showing the relationship between ICT competence and attitude component sub-scores.

Model	Sum of squares	df	Mean square	F	Sig.
Regression	154398.9	6	25733.15	67.941	.000
Residual	173848.8	459	378.756		
Total	328247.8	465			

Table 3. Using attitude constructs to predict ICT competence.

Variables	R	R-square	Adjusted R-square	Standard error	Sig.
Affective component Perceived usefulness Behavioural factor Perceived control factor Defense factor General attitude	.686	.470	.463	19.46	.000

items were drawn from the Computer Competence Scale developed by the Board of Studies of New South Wales, Australia. CAS was originally developed by Selwyn (1997) but was modified for Singapore teachers by Soh (1998). The scale comprises of 21-item five-point Likert scale with five constructs namely, affective components, perceived usefulness factor, behavioural factor, perceived control factor and defense factor.

Affective component assesses users' possible fear, apprehend-sion and hesitation or discomfort in computer use. Perceived use-fulness factor assesses whether the user finds computer to be generally helpful, productive, imaginative and interesting in relation to a persons work. Behavioural factor examines approach avoidance or whether computer is used regularly. Perceived control component assesses a person's perceived ability to control the computer. Defense component assesses whether a person is free from defensive attitude against the use of computer. The total score yields the attitude of the user towards using computer. CCOS and CAS have been obtained to yield good psychometric properties. For example Jegede (2006) obtained reliability coefficients of 0.95 and 0.90 for CCOS and CAS respectively. The two instruments were administered jointly on the teachers by the researcher and some field assistants. The data collected were analyzed using Pearson correlation co-efficient and multiple regression analysis.

RESULTS

The relationship between computer competence and general attitude is significant with r = .663. The correlation coefficients between competence and each of affective component, perceived usefulness factor, behavioural factor, perceived control factor and defense factor are r = .393, .503,.595, .611, .396 respectively with all of them statistically significant at .05 level of significance (Table 1).

In order to verify whether a combination of the attitu-dinal constructs significantly predict computer competen-ce, data collected were analyzed employing regression analysis. The analysis of variance of the multiple regression data yields an F-ratio of 67.491 which is significant at .05 level. This implies that a combination of attitude constructs is significantly related to computer competence (Table 2).

Table 3 shows the results of the regression analysis on the relationship between the dependent variable (computer competence) and the combination of the six independent variables. This indicates that predicting computer competence of teachers with the six independent variables of computer attitude and attitudinal constructs give a coefficient of multiple (R) of .686 and a multiple correla-tion square (R^2) of .470. These values are statistically significant at .05 level of significance; suggesting that only 46.3 percent of the variance of computer competence were explained by the combination of the six independent variables to predict computer competence.

In addition, the standard Regression weight (B), Standard Error of Estimate, Beta, T-ratio and the level of significance for each of the independent variables are presented in Table 4. This is with a view to further determining the relative power of each of the six independent

Table 4. Significant tests of regression weights of independent variable of competence and attitude

Variables	B	Standard error	Beta	T	Sig.
Affective component	.417	.181	.108	2.310	.021
Perceived usefulness	.134	.361	.020	.371	.711
Behavioural factor	.663	.422	.107	1.569	.117
Perceived control factor	1.776	.377	.256	4.716	.000
Defense factor	.209	.502	.018	.417	.677
General attitude	.665	.155	.420	4.299	.000
Constant	6.146	3.285		1.871	.062

variables to predict computer competence. Only two of the variables contribute largely to the prediction of the dependent variable (computer competence). From the values of Beta weights and t-ratios for each independent variable, it becomes apparent that perceived control factor as well as affective component contribute to the prediction of competence, the dependent variable.

DISCUSSION

A major finding of this study is that ICT attitude bears significant relationship with and also predicts competence. This is supportive of the finding of Zhang and Espinosa (1997), though opposed to that of Hernes et al. (2000). Hogan and Farren (2000) also expressed similar opinion as that of Hernes et al. (2000). The reason(s) for this discrepancy is not immediately clear. The instrument used may have varied on their emphases on pedagogical use of ICT. However, the study obtained that the components of the attitude that significantly predict competence are the affective and perceived usefulness. The implication of this is that the attitudinal component that would enhance good ICT competence are freedom from ICT anxiety and the extent to which teachers believe ICT assists their work .

On freedom from ICT anxiety, empirical results have shown that computer anxiety has negative effects on computer use (Harrington et al., 1990; Mahar et al., 1997) and computer performance (Brandley and Russell, 1997; Brosnan, 1998). Naturally, continuity with computer explorations will most likely exist if there is freedom from apprehension and anxiety. This continuity will inform better competence since 'practice makes perfect'. Similarly when computers are perceived useful, there is the urge to learn the skills better. For example Czaja and Shant (1998) explained the appreciation and interest of old adults towards computers when they perceived the appli-cation of computers to their daily living and jobs. This seems to have been the same with teachers, as teachers perceive computers to be useful in their pedagogical enterprise, the interests become aroused which in turn help their computer skills.

A possible limitation of the study is that the relationship between computer competence and attitude was not investigated based on specific computer skills (that is word processing, programming, CAI etc.). Further investtigation is needed in exploring how different attitudinal constructs relate with specific computer competence or skills. However, the study obtained that being skilled and possessing positive attitude towards computers are necessary requirements for teachers ICT preparedness.

Conclusion

This paper investigates the relationship between ICT attitudes, attitudinal constructs and competence of selected Nigerian teachers. The study obtained a significant relationship between attitudes toward ICT and competence. It was further obtained that the attitudinal constructs that would predict ICT competence include perceived control factor as well as affective component.

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