

TEACHERS' WILLINGNESS TO INTEGRATE ICT TOOLS IN CLASSROOM TEACHING AMONG PRIMARY SCHOOL TEACHERS IN MSAMBWENI SUB-COUNTY KWALE COUNTY, KENYA

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This study sought to explore the extent to which demographic and contextual factors predicted teachers' willingness to use ICT tools in classroom teaching. Empirical evidence has shown that teachers' perception of a concept is an important attribute of the success or failure of implementation of the concept. To achieve this, the study sought to find out if demographic factors such as age, gender, years of teaching experience and the teachers area of specialisation (department) influenced teachers' willingness to integrate ICT as well as the extent of the contribution of contextual factors such as teachers' level of mastery and self-efficacy. The study was conducted among a sample of 126 primary school teachers in Msambweni District in Kwale County, Kenya. Data was collected through a self-report questionnaire constructed by the researchers. The study findings revealed that while age and having access to an internet enabled phone were a negative significant predictor of teachers' willingness to integrate ICT, gender, teaching experience and teachers' area of specialisation were positive insignificant predictors. Similarly, teacher's level of mastery was found to predict their willingness to integrate ICT with teachers' mastery of ICT in teaching being significant. The study also established that teachers' level of use of ICT tools was still very low even where ICT tools were already available and therefore recommends that the government supports teachers by in-servicing them on ICT skills to increase mastery thus willingness of use. Similarly, it is important that schools put in place departmental ICT support structures to institutionalize integration of ICT in classroom teaching.

Keywords: ICT tools, Willingness, ICT integration, Mastery.

Introduction

Studies have associated improved quality and quantity of teaching and student learning with consistent use of ICT tools such as computers and the Internet in classroom teaching (Miima, Ondigi & Mavisi, 2013; Sabzian & Gilakjani, 2013). Thus, the belief that integration of ICT tools in classroom teaching positively impacts student learning has led many governments, Kenyan government included in creating programs for the integration of the tools in schools. However, early studies reported some teachers' resistance to integration of ICT in classroom learning (Sheingold & Hadley, 1990). Even several recent studies have demonstrated that most teachers will not adopt the use of computers in those schools surveyed (Miima, Ondigi & Mavisi, 2013). The purpose of this study was therefore to assess and describe the effect of primary school teachers' demographics and contextual factors on their willingness to integrate ICT tools in classroom teaching. By examining the effects of their willingness, the conditions and requirements for motivating them can be identified and improved.

Teachers' willingness to use ICT tools such as computers in classroom is a factor of their attitude towards use of such tools and the importance that they attach to the use of the tools in classroom teaching. According to Sabzian and Gilakjani (2013), it is a factor of the biases and stereotypes that teachers may hold about the use of computers and the factors that act as facilitators to teachers' positive computer usage. The researchers also hold that teachers' attitudes towards computers affect the successful use of computers in the classroom and these

attitudes, whether positive or negative, affect how teachers respond to technologies. It has been alleged by some researchers that if teachers perceived technology programs as neither fulfilling their needs nor their students' needs, it is likely that they will not integrate the technology into their teaching and learning (Hew & Brush, 2007; Keengwe & Onchwari, 2008).

Resistance to use of ICT tools in classroom teaching by teachers has been attributed to several reasons. Mayya (2007) posit that there is a natural tendency to resist new ways of doing things. According to Taneri and Seferoglu (2013), the reasons for teachers' resistance to integrate technology include internal factors such as teachers ICT competencies and teachers' attitudes towards the integration of ICT tools in the lessons or external factors like their in-service education about ICTs, lack of appropriate hardware and software, having Internet connection troubles, lack of infrastructure, and insufficient teaching materials. Other researchers posit that teachers' confidence in utilizing technology, their beliefs about the value of technology and student learning were internal factors that prevented teachers from using technology (Dexter, Seashore & Anderson, 2002; Newhouse, 2001; Zhou, Pugh, Sheldon & Byers, 2002). According to Keengwe and Onchwari (2007) teacher's negative attitude is responsible for the slow acceptance of modern technology in the educational environment which is supported by Tanneri and Seferoglu (2013) who hold that lack of personal confidence in using learning technologies, and the nature of pre-service teacher education courses are some of the factors responsible for teachers resistance to use ICT tools in classroom teaching.

Contradictory findings exist on the link between demographic factors and teachers' willingness to use ICT tools. Two major trends emerge in research. While some studies (Alazzam, Bakar, Hamzah & Asimiran, 2012; Norris, Sullivan, Poirot & Soloway, 2003) found out that gender, age and teaching experience were not significant predictors of teachers' willingness to use ICT tools, others, (Blankenship, 1998; Lau & Sim, 2008) have found differences in the willingness on the basis of the demographic factors. Lau and Sim, (2008) found that teachers' age influences their willingness to use ICT tools and that older teachers frequently used computer technology in the classrooms more than the younger teachers. Likewise Jamieson-Proctor, Burnett, Finger and Watson (2006) posit that male teachers are more willing to use ICT tools which is refuted by Blankenship (1998) who found female teachers to be more willing users than male teachers.

Similar findings exist on link between contextual factors and their willingness to integrate ICT tools. Mastery experiences involve direct, personal performance of a task, or the actual experiences that an individual undergoes (Wangeri & Otanga, 2014). Yan (2002) found that mastery in IT was a significant predictor of the use of innovative teaching methods that is supported by Wangeri and Otanga (2014) who found that teachers' mastery of teaching skills accounted for 20.8% of variance in use of innovative methods. Researchers have also shown that willingness and effective use of computers is dependent on the teachers' ICT skills as well as their intentions towards ICT use (Vanderlinde, Braak & Hermans, 2009; Venezky, 2004). To them, relevant professional development can take the form of observing colleagues, learning from each other, observation of each other's' ICT-integrated lessons, as well as the provision of opportunities for teachers to share and collaborate with each other (Flanagan & Jacobsen, 2003; Jacobsen, 2002; Prain & Hand, 2003). Sandholtz and Reilly (2004) on their part claim that teachers' technology skills are strong determinant of ICT integration, but they are not conditions for effective use of technology in the classroom.

Though these studies are very important to this work, they were done in developed countries and majorly based in secondary and higher education systems. The paper focuses on the teachers' perspective about integration of ICT in teaching and learning in Kenyan primary schools an area with minimal empirical data.

Objectives

The study specifically sought to:

1. Assess teachers sources of knowledge in use of ICT tools
2. Determine the extent to which teachers' demographic factors influence their willingness to use ICT.
3. Determine the extent to which teachers' mastery of teaching methods influences their willingness to use ICT.
4. Determine the influence of departmental support on teachers' willingness to use ICT.

Conceptual Framework

The study conceptualizes the interrelationship between the elements presumed to predict willingness to integrate ICT tools in classroom teaching by teachers as is illustrated in figure

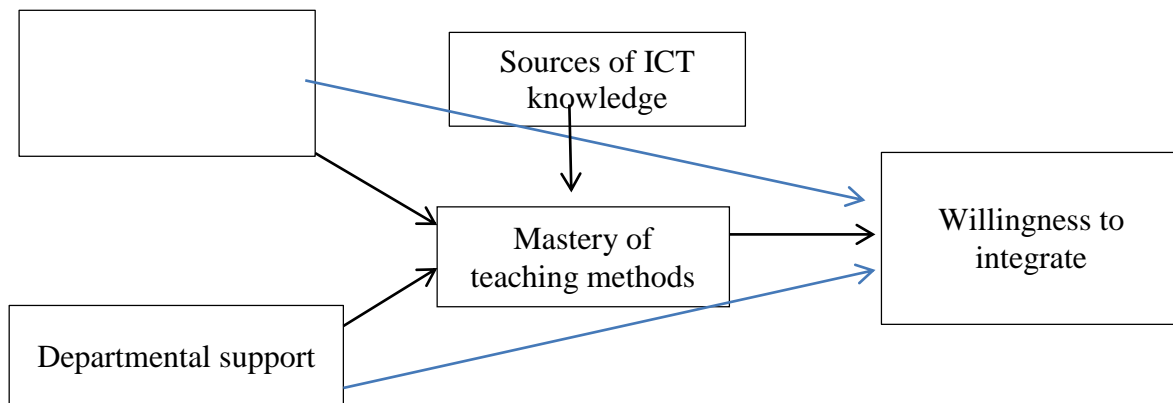


Fig1. Hypothesised interrelationships of variables of teachers' willingness to integrate ICT

Figure 1 shows the hypothesised relationship of the elements that are perceived to predict teachers' willingness to integrate ICT tools in classroom teaching. Integration of ICT tools involves a number of independent variables. These include background factors and departmental support that are mediated to by mastery of teaching methods.

Research Methodology

Participants and Procedure

Participants were 126 (57 female, 69 male) teachers in primary schools in public primary schools in Msambweni sub – county in Kwale County, Kenya. The respondents were told that the study aimed at improving their teaching in schools. Respondents completed a questionnaire constructed by the researchers. The questionnaire was completed during their free time.

Measures

Sources of knowledge in ICT. Two items measured teachers' sources of knowledge in ICT tools that were sub-divided into two. The first statement "How did you obtain your knowledge in IT" was to ascertain teachers' source of knowledge while the second, "If given a computer, which of the following operations are you able to perform?" intended to assess the task that teachers could perform with this knowledge. The ratings were made on a 4-point scale.

Mastery of techniques of instruction. An item each measured the extent of mastery of whole class instruction, small group instruction and use of Information Technology; all ratings were made on a 5-point scale (1 = very low skilled, 5 = most skilled). A mean score of each item was computed.

Departmental support. Two statements were used to rate teachers' perception of the support they received from departmental colleagues. A mean score of the 2 items was computed.

Dependent Variable. The teachers' willingness to integrate ICT tools was measured based on the respondents' conception of their readiness to use available ICT tools including Internet enabled phones.

Results and Discussion

Descriptive

Means, standard deviations, and intercorrelations for scores on each of the variables are presented in Table 1 for the total sample (Appendix) while results from regression analysis are presented in Table 2. Willingness to integrate ICT tools in classroom teaching was positively and significantly correlated with age, gender, experience and departmental support. It was also highly correlated with mastery of whole class instruction, small group instruction and overall mastery. Departmental support was strongly correlated with mastery of whole class instruction, mastery of small group instruction and overall mastery. As expected mastery of whole class instruction was positively correlated with mastery of small group instruction. The implication is that mastery of whole class instruction and small group instruction are mutually inclusive.

Sources of Teachers Knowledge in ICT

The first objective intended to assess source of teachers' knowledge in ICT tools. Frequency and percentages were used to describe teachers' sources as well as the extent of application of such knowledge. Data obtained illustrated that a majority of the teachers, 79 (62.7%) had attended formal training in ICT from where they obtained knowledge on use of ICT tools as compared to those who learnt by observing their friends/colleagues use the ICT tools (42 – 33.3%), those who acquired the knowledge themselves either from a computer using computer manual (2 – 1.6%) or from internet enabled phones (3 – 2.4%). Further, the results demonstrated that except for management of data from CD, flask disk or other storage device which reported low rate of use (36.5%), the use of ICT tools such as internet browsing (79.4%), Microsoft windows (77.8%) and storage and sharing of information (54.8%) were reported to be fairly in active use at variable rates. On the whole, teachers reported some levels of knowledge in use of the tools with formal basic training in ICT being the most predominant source. Relative to applicability of this knowledge, a considerable proportion of the teachers indicated that they could browse for information from the internet (79.4%), (77.8%) could use Microsoft windows systems while (54.8%) could store and share information using ICT tools. In line with previous research, Sandholtz and Reilly (2004) on claim that teachers' technology skills are strong determinant of ICT integration, though they are not conditions for effective use of technology in the classroom.

Influence of Teachers' Demographic Factors on their Willingness to Integrate ICT

The second aim of the study was to determine the influence of teachers' demographic factors on their willingness to integrate ICT tools in classroom practice. A majority of the teachers were found to be 35 years and above (72.2%) and there were slightly more males (54.8%) than females (45.2%). Similarly, (64.3%) had over 10 years working experience and the teachers were almost fairly distributed across the departments though social studies (7.9%) and Kiswahili (16.7%) had slightly fewer members. Further, though almost all of the respondents (98.4%) acknowledged having a phone, only 59.5% indicated that their phones

were Internet enabled. Findings of the study indicate that teachers in the 25 – 34 and 35 – 45 recorded the highest levels of willingness to integrate ICT tools ($M = 3.66, 3.60$) respectively. The lowest means were reported by those above 45 years of age ($M = 3.00$). Female teachers recorded a higher level of willingness to integrate ($M = 3.59$) as compared to their male counterparts ($M = 3.26$) with females in the 25 – 34 age bracket reporting the highest levels of willingness ($M = 3.69$). ANOVA results show a significant effect of age on willingness to integrate, $F(2, 118) = 10.30, p < .001, 0.1$] with minimal partial Eta Squared. Similarly, gender was found to have a significant effect on willingness to integrate, $F(1, 118) = 8.88, p = .004$] though the effect size was even less minimal. Post Hoc test showed that willingness to integrate ICT tools by teachers of 25 – 34 age is significantly different from those of above 45 years ($p < .001$), the difference being more pronounced for female teachers in these age groups. Further, a hierarchical regression analysis was conducted to establish the respective contributions of demographic factors such as age, gender, teaching experience, the teachers' department and having an internet enabled phone on willingness to integrate ICT tools in teaching. It was found that 6.4% of the variance in willingness to integrate was accounted for by age, $F(1, 122) = .205, p = .005$]. When entered, gender accounted for 1.9% of variance in willingness to integrate beyond that accounted for by age $F(2, 121) = .148, p = .117$]. Experience, department and having an internet enabled phone explained 0.0%, 0.6% and 9.8 % variance in willingness to integrate respectively $F(3, 120) = .006, p = .928; F(4, 119) = .038, p = .364$ and $F(5, 118) = .356, p = .025$]. The regression equation for influence of demographic factors on willingness to integrate which was found to be significant ($p = .042$) showed that the factors accounted for 18.7% of the total variance. Specifically, age and having an Internet enabled phone were found to have a significant negative influence on teachers' willingness to integrate though gender, teaching experience and department each had a positive insignificant influence. These findings were found to generally support those of Lau and Sim, (2008) who maintains that teachers' age influences their willingness to use ICT tools though it contradicts it on specificity of age differences since according to the researchers, older teachers were found to frequently use computer technology in the classrooms more than the younger teachers. Likewise, the findings on gender concurs with Blankenship (1998) who found female teachers to be more willing users than male teachers but disagrees with Jamieson-Proctor, Burnett, Finger and Watson (2006) who posit that male teachers are more willing to use ICT tools.

Influence of Mastery on Teachers Willingness to Integrate ICT Tools

The study also aimed at determining the influence of mastery of teaching skills on teachers' willingness to integrate ICT tools. The findings were as summarized in Table 1 and 2 in the appendix. It was found that teachers had high perceptions of their levels of mastery of whole class instruction ($M = 3.7778$), small group instruction ($M = 3.7778$) and use of ICT tools ($M = 3.1508$). Mastery was also found to be generally high ($M = 10.7063, SD = 1.54437$). The hierarchical regression model used showed that influence of mastery of whole class instruction accounted for 2.5% of the total variance on willingness to integrate $F(1, 124) = -.019, p = .834$, mastery of small group instruction accounted for 16.9% $F(2, 123) = .517, p = .081$ while mastery of ICT skills accounted for 44.7% of the total variance [$F(2, 122) = .341, p < .001$]. The models which were generally significant ($p < .05$) also showed that individually, mastery of whole class teaching is an insignificant negative determinant of teachers' willingness to integrate ICT tools while mastery of small group instruction is an insignificant positive determinant. However the results showed that mastery of ICT method of instruction influences willingness to integrate ICT tools positively, the finding being significant ($p < .05$). On whether or not mastery of teaching methods mediated for demographic factors and departmental support, against teachers willingness to integrate ICT tools, mediation effects were seen $F(2, 123) = 2.611; F(2, 123) = 1.940$. This means that it is

imperative that teachers develop their ICT skills as a way of enhancing the process of ICT integration. The findings are largely consistent with those of Wangeri and Otanga (2014) as well as Yan (2002) who in their research found that mastery in IT is a significant predictor of the use of innovative teaching methods. It also corroborates the assertions of Vanderlinde, Braak and Hermans (2009) and Venezky (2004) who insists that willingness and effective use of computers is dependent on the teachers' ICT skills as well as their intentions towards ICT use.

Influence of Departmental Support on Teachers Willingness to Integrate ICT Tools

Lastly the study set out to determine the influence of departmental support on teachers' willingness to integrate ICT tools in classroom practice. Two items were used for this purpose. The first item attempted to determine teachers' perception of the extent to which their departments could be contributing in enhancing their knowledge in ICT. In response, 73 (57.9%) which is a slight majority acknowledged receiving instrumental support from their departmental colleagues. A subsidiary item which was intended to quantify the extent of the departmental support received by teachers reported that 24 (19.0%) had received useful suggestions on use of ICT tools on between 3 and 5 occasions, 96 (76.2%) had had support equivalent to 6 to 10 times while 3 (2.4%) had had departmental support on more than 10 occasions. A linear regression analysis performed to infer on the influence attributed 4.0% of the total variance to departmental support, $F(1, 124) = .034$, $p = .495$. Departmental support was thus indicated to have an insignificant negative influence on willingness to integrate ICT tools. Though this could be interpreted to mean that departmental support may not account for much relative to teachers' willingness to integrate ICT tools, previously research has shown that observing colleagues, learning from each other, observation of each other's' ICT-integrated lessons, as well as the provision of opportunities for teachers to share and collaborate with each other is a significant predictor of teachers' willingness to integrate ICT tools (Flanagan & Jacobsen, 2003; Jacobsen, 2002; Prain & Hand, 2003).

Implications, Limitations and Conclusions

Implications for the innovation of teacher preparation

According to our findings, willingness to integrate ICT tools in classroom teaching is influenced by the complex of teachers' background factors such as age, access to the ICT tools and mastery of ICT instructional skills. The latter implies that teacher education should reconsider its training approaches which include being carried out in constructivist learning environment that provide student teachers with a conducive and non-threatening environment to experience success in using the computers. This will allow them to gain competence and confidence in using computers for teaching and learning (Teo, 2008). In addition, Albion (1999) stresses the need for real life experiences in classroom settings.

Limitations and Directions for Further Research

It should be noted that this study has a number of limitations. The quantitative research methodology is mainly based on self-report measures. Future studies could build on classroom observation of teachers' integration of ICT tools or interviews with the teachers. Furthermore, longitudinal studies are recommended that might be helpful to track changes in thinking processes and related teaching practices with and without educational technologies. Since the potential of ICT can differ according to specific curriculum goals and specific knowledge domains, more attention should be paid in future studies to the nature of the curriculum taught with or without ICT. It should also be noted that the findings of the present study have to be interpreted in a careful way since a convenience sampling procedure was applied. Respondents were drawn from most primary schools in the sub – county that the researchers could readily access which could have caused uncontrolled bias.

Conclusion

Our study has provided insight into the influences of various factors on teachers' willingness to integrate ICT tools in classroom teaching in a Kenyan context. The findings suggest that successful digitization of the primary school classroom as is anticipated by the government largely depends on teachers' willingness to use the technology tools. The results underpin the importance of an integrated and concurrent understanding of teachers' thinking processes and suggest that in order to attain the innovation of classroom activities; teachers need to be actively involved.

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Appendix: Result Tables

Table 1: Means, standard deviations, and correlations between the variables of the study (N = 126)

Variables	Mean	SD	1	2	3	4	5	6	7	8	9
1. Age	2.88	.658	-	.140	.690**	.270**	.399**	.376**	-.169	.261**	-.052
2. Gender	-	-	-	-	.306**	-.172	.100	.114	.156	.163	-.011
3. Experience	2.99	1.12			-	.100	.470**	.422**	-.031	.373**	.016
4. Department	2.76	1.20				-	.456**	.432**	.034	.399**	.088
5. Mastery – WCI	3.78	.679					-	.965**	.093	.890**	-.092
6. Mastery – SGI	3.78	.656						-	.134	.906**	-.134
7. Mastery – ICT	3.15	.658							-	.524**	.074
8. Mastery	10.70	1.54								-	-.066
9. Departmental S.	3.43	.515									-

Table 2: Summary of Results from Regression Analysis of Variables on Willingness to Integrate ICT

Variables	B	β	t	p	R ²	Adj.R ²	R ² change
Age	-.205	-.253	-.2.892	.005	.064	.056	.064
Gender	.148	.139	1.579	.005	.083	.068	.019
Experience	.006	.011	.091	.015	.083	.060	.000
Department	.038	.084	.911	.024	.089	.059	.006
Mastery – WCI	-.019	.070	-.274	.785	.025	.001	.001
Mastery – SGI	.517	.274	1.886	.062	.169	.029	.028
Mastery – ICT	.341	.067	5.111	.000	.447	.200	.171
Departmental S.	-.034	-.040	-.450	.000	.040	.002	-