The Contribution of User involvement to ICT Up-take in National Teacher Training Colleges in Uganda: A Case of National Teachers' College, Kaliro

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Abstract

The study examined the relationship between user involvement and Information and Communication Technology (ICT) up-take in National Teacher Training Colleges. The study attempted, within the framework of theory of Diffusion of Innovations (Rogers, 2003), to examine ICT diffusion in National Teachers' College, Kaliro using teaching staff as the unit of adoption. The participants stood at 94.4% male, compared to only 5.6% female. Male respondents dominated this study. This situation also obtains in the other National Teacher Training Colleges of Uganda with all having less than 10% female teaching staff. Some respondents 25.0% reported that they had had no computer training and a limited number 13.9% of the teaching staff had less than five days of training. This scenario is associated with the fact that ICT innovations in teaching are a relatively new phenomenon in teacher training in Uganda. The distribution indicates on average, limited training – an indication of a crucial predictive element in the up-take of ICT in teacher training, which demands sufficient exposure to technological innovations in the teaching/learning process. Further research may consider changing the setting, population, sampling procedures, or data collection methods in a more gender balanced institution.

Keywords: User Involvement, Diffusion, ICT Uptake, perception, competence.

Introduction

ICT up-take is understood to mean the rate or act of taking or accepting technologies to enhance attitude towards computers, perception towards computer attributes, ICT competence, and skills among students, staff and management of an institution (Albirini, 2006). ICTs are continually becoming integrated in teaching, learning and research processes globally (Agbonlahor, 2005). The United Kingdom started stimulating efforts in ICT integration since 1970, while Japan took first steps in introducing ICT into schools in 1985 (Jegede, Dibu-Ojerinde & Olugbenga, 2007). In the United States a lot of research has been conducted about up-take of ICT. Notable among the studies, is how full-time in-service teachers incorporated the use of computer technology in their classrooms in the United States (Wilson & Notar, 2003). The survey followed up by interview, involved 68 full-time secondary teachers representing all socioeconomic levels and multiple cultures. The results show various areas of ICT use but also found limitations. The limitations included: less time of usage (secondary teachers 3.2 hours per week and elementary teachers 1.9 hours per week on average), only a few teachers used computers for instruction, and none reported use of ICT for student instructional activities. Against this evidence therefore, the global situation brings out a number of factors at play in ICT up-take in education, which begs further investigation.

Mozambique launched her experimental phase of integrating ICT into the curriculum in 1997 (Smail, 2001, as cited in Jegede, et al 2007). Ghana is another country in Africa, whose education stakeholders have been concerned about ICT up-take in schools and how their use supports learning. Yildrim (2007) reveals that, teachers agree access to ICT system resources is one of the effective means to integrate ICT in classrooms. However, most teachers do not seem prepared to diffuse ICT into their teaching practices. The research teachers' readiness for the use of ICT in Ghanaian schools raises issues which are typical to most of sub-Saharan Africa. A survey on classroom and schools used reported that 71% of teachers do not use ICT

in classrooms, 49% of teachers use ICT to prepare lesson notes, 55% have knowledge of web browsing, 71% use email, and 78% try to make an effort to learn how to use the computer (Boakye, & Banini, 2008). Beynon and Mackay (1993) contend that introducing ICTs into teaching creates a number of tensions and that non-usage of ICT resonates with personal beliefs and professional philosophy of teaching.

The factors enabling and constraining ICT up-take are essentially the same in both developed and developing economies, though they obviously differ in terms of importance (Farrell, Glen, & Shafika, 2007). Uganda as a nation has progressed slowly in the use of ICT in all sectors of the nation's existence especially in teacher education despite the advantages. ICT has the potential to accelerate, enrich, and deepen skills; motivate and engage students in learning; help to relate school experiences to work practise; contribute to radical changes in school; strengthen teaching, and provide opportunities for connection between the school and the world (Olulube, 2007). This calls for school-wide teacher professional social systems that affect the levels of classroom pedagogy, social support for student learning, and affect student performance and ICT up-take (Newhouse, et al 2002). Additionally, Selwyn (2008) documents that the internet can provide ready access to educational material, accelerate student learning, knowledge building and use the internet as a ready means of delivering content. Yet in spite of all these positives, hardly any studies have been done related to user involvement and ICT up-take in Uganda. Even where some studies have been done, the results have been context-specific and not related to National Teachers' Colleges.

In spite of the efforts by National Teachers' College, Kaliro, attitude towards computers, perception towards computer attributes, ICT competences, and skills among staff are still very low. During the period 2006 to 2009 the Ministry of Education and sports reorganised the National Teachers' Colleges, regularised staff and made several transfers in a bid to improve service delivery. A survey conducted in April 2009 using the teaching-staff user-log

indicated only 13.2% made use of the computer resource-centre. This provided evidence of low utilisation by staff who manually prepare schemes of work, lesson plans and notes, assess, and record information. The situation, if not addressed maintains the low levels of ICT up-take among the teaching staff, which results in ill prepared teachers who are incapable of facilitating the diffusion of ICT in schools, and the curriculum. In addressing this issue, Brown and MacIntyre (1993), counsel that the teachers must be convinced of both the need for change, and that the means for change that can be incorporated into their practice are available. User involvement an institutional factor, which Rogers (2000) classifies as external factors have a close link with determining teachers' attitudes towards computers, perception towards computer attributes, ICT competencies, and ICT skills. The present study, tried to explain the contribution of user involvement to ICT-uptake in National Teachers' Colleges in Uganda, a case of National Teachers' College, Kaliro.

Goal of the Study

To explain the contribution of user involvement to ICT up-take at National Teachers' College, Kaliro.

Research Questions

How does user involvement contribute to ICT up-take at National Teachers' College, Kaliro?

Diffusion of Innovation Model

Rogers' (1995) Diffusion of Innovation

Stages of adoption:

Awareness - the individual is exposed but lacks complete information about the adoption

Interest - the individual becomes interested in the innovation and seeks additional information

Evaluation - individual mentally applies the innovation to his present and forecast situation, and decides whether to try it or not

Trial - the individual makes full use of the innovation

Adoption - the individual continues to make full use of the innovation

Methodology

This study employed a case study and correlational research design focusing on National Teachers' College, Kaliro as a case. ICT up-take is an outcome of a myriad of factors, but user involvement formed the focus of this study in an effort to examine how user involvement explains the level of ICT up-take in National Teachers' College, Kaliro.

Use was made of both quantitative and qualitative methods of data collection and analysis. The quantitative method was used to determine the relationship between user involvement and ICT up-take. The qualitative methods brought out a holistic inquiry through interviews and discussions with key informants of selected students, and management of the College.

Due to the large population in National Teachers' Colleges, and geographical dispersion of the Colleges in Uganda, the study targeted a population of 105 individuals in National Teachers' College, Kaliro. The target population was obtained by stratification whereby the population was taken from the different strata of management (eight), and teaching staff (53) from four departments namely: Science, Vocational, Professionals, and Arts. The students were sampled from only three departments of Science (20), Vocational (six), and Arts (18), since all students take the professional course.

Sample Size and Selection

The unit of analysis/key respondents in this study were the teaching staff. This as Hussain, & Safdar (2008) posit, in the era of ICTs teachers will be spending more time in facilitating students' learning rather than delivering lectures in the classroom. Teachers will be spending time in coaching students and helping them through reviewing the huge information, which impacts on ICT up-take. Krejcie & Morgan cited in Amin (2005) provides a formula which was used by the researcher to determine the- sample sizes. Since there are only 53 teaching staff according to the payroll reference number 740152 from the Ministry of Education, a sample size of 48 respondents was taken. In the case of management (eight) and student representatives (44), samples of eight and 42 respectively were selected. Stratified sampling was used to sample the student representative population. The student representative population was divided into subgroups according to the Department where they belong. From each of the subgroups student representatives were selected to provide information since students are the major beneficiaries in an educational institution.

Data Collection Procedures

A letter of introduction was secured from Uganda Management Institute. It was presented to the management of National Teachers' College, Kaliro, from whom permission was sought to administer the questionnaires, and conduct interviews. In order to ensure reliability, a test-retest procedure of the questionnaire was conducted. The questionnaire was administered to five staff (5% of the teaching staff) of Kabalega College, Masindi which trains teachers like National Teachers' College, Kaliro and was re-administered after three days to the same respondents. The test-retest results yielded an overall Cronbach's coefficient alpha of 0.876. The Researcher gave the questionnaire to experts who assessed the content and face validity

of the instrument. Additionally, experts reviewed the questionnaire to ensure it is capable of capturing the required data.

Collection Instruments

These included: self-administered questionnaire, interview guide, and observation checklist. The questionnaire had questions on independent variable and dependent. The independent variable had questions developed by the Researcher from a wide review of literature and were measured using a five-point likert scale. The dependent variable had questions adapted from Albirini (2004) that were measured using a five-point likert scale for the dimensions on: computer attitude, and Computer attribute ranging from strongly disagree to strongly agree. The dimensions of ICT competence and ICT skills had questions that were measured using a five-point scale ranging from not aware, to confident and could explain a function to others. These were developed based on literature review and computer-related technologies in education (Isleem, 2003; Al-Oteawi, 2002). The Researcher used two structured interview guides, which were administered to management and to student representatives. The management among others plays a supervisory role, and implement institutional policies, while the students are the key beneficiaries from the teaching staff in an educational institution. The observation checklist was used by watching the number of times in say a week particular individuals access the computer resource centre, following up on what they do there, how much time they spend, what resources they use in their teaching, and so on.

Data Analysis

The study was correlational in nature since it aimed at determining the relationship between variables. Responses from the questionnaires were analysed using Spearman's rank correlation coefficient to determine relationships. The strength of the relationships between variables was tested and the variables that were highly correlated taken as the factors that

contribute to ICT uptake in National Teachers' College, Kaliro. In the case of qualitative data, interviews were transcribed verbatim, systematically read and grouped according to the research questions. Afterwards, content analysis was done, where key questions formed the basis for grouping. Lastly relationships amongst groups was sought and assembled into themes that were used to augment the analysis of quantitative data.

Results

To determine the extent to which user involvement contributes to ICT uptake, Participants responded to likert-type statements dealing with attitude towards computers, perception towards computer attributes, competencies, and skills.

The overall mean score of participants' responses was 3.13 (Standard Deviation 0.77), indicating moderate ICT uptake at National Teachers' College, Kaliro. However the major factor accounting for this moderate ICT uptake was attitude towards computers with mean score 4.07 (Standard Deviation 0.43) followed by perception towards computer attributes with mean score 3.81 (Standard Deviation 0.34). The least factor accounting for low ICT uptake was computer skill with mean score 2.76 (Standard Deviation 0.36) followed by computer competence with mean score 2.47 (Standard Deviation 0.45). Therefore the critical factors that need to be addressed urgently are computer skills, and computer competence.

In order to find out the contribution of user involvement to ICT up-take in National Teachers' College, Kaliro, the Researcher gave the respondents a set of questions to assess the contribution of user involvement as a dimension of institutional factors and ICT uptake in National Teachers' College, Kaliro. Participants responded to Likert-type statements regarding the involvement of users.

The results indicated, the majority of respondents (72.2%) opined they did not have sufficient time in their lessons for ICT related activities, indicating weak user involvement. This weak

user involvement mitigates the contribution to ICT up-take in National Teachers' College, Kaliro. The User involvement dimension was envisaged to include staff time and student time and the results are discussed hereunder:

As a factor of user involvement, several items in the questionnaire were presented to rate staff involvement. The findings showed the majority of respondents (72.2%) disagreed that they have sufficient time in their lessons for ICT related activities in the College. Discussions with management confirmed this, and the reason was attributed to a tight timetable of the core examinable subjects like history, geography, and the like taking much of the time. Asked whether they are involved in decision making about ICT literacy, the majority (69.5%) said they are not. Interviews revealed it is top management, which makes decisions as far as ICT procurement, deployment and usage is concerned. The study also revealed the majority (69.5%) do not have time to plan lessons using new methods in which ICTs are used. The staff (55.6%) does not pose questions to students to stimulate and direct them when they are using ICT. A total of 58.3% reported they have no time to teach ICT skills to students. This is further confirmed when the study shows the lack of time to organise and manage the use of ICT in the classroom (61.1%). There is also lack of time to teach whole class lessons using ICT (66.6%), and limited time to extend student learning through use of ICT (66.7%). Mukasa Ronald a student of physics year two says: *"It is only in physics that we attend ICT based lessons, but not in other subjects."* Results from interviews confirmed the limited staff involvement with ICT. This suggests that the College is still steeped in the traditional instructional approaches which are lecture based with limited use of educational technologies. A correlation analysis gave the following results:

Table 12. Correlation between staff time and ICT up-take

Correlations

			ICT up-take	Staff time
Spearman's rho	ICT up-take	Correlation Coefficient	1.000	
		Sig. (2-tailed)	.	
		N	197	
	Staff time	Correlation Coefficient	.074	1.000
		Sig. (2-tailed)	.299	.
		N	197	197

(Source: Primary data)

The correlation results indicate a very weak and insignificant relationship (r=0.074; p=0.299). The limited involvement of the teaching staff implies there is no contribution of user involvement to the uptake of ICT at the college. Hence, other factors contribute to the limited ICT uptake in National Teachers' College, Kaliro, other than staff time.

Student time was also taken as a factor of user involvement. The majority of respondents (86.1%) overwhelmingly disagreed that students have access to computers in the classrooms. Asked whether students are adequately involved in decision-making about ICT use, 58.3% of respondents returned a negative response. Ikiror Harriet (Agriculture Double main) confirms: *"The student voices are not heard and that access to ICT facilities is limited mainly because ICTs are not used in class and that the requisite educational software is not available."* The Researcher's discussion with the students revealed it is true the college has very limited ICT facilities to be used in class. They also confirmed that they are rarely involved in decisions about ICT, though occasionally discussions are held with the administration during the weekly one-hour meetings with the Principal and other staff. A correlation analysis gave the following results:

Table 14. Correlation between student time and ICT up-take

Correlations

			ICT up-take	Student time
Spearman's rho	ICT up-take	Correlation Coefficient	1.000	
		Sig. (2-tailed)	.	
		N	197	
	Student time	Correlation Coefficient	.061	1.000
		Sig. (2-tailed)	.398	.
		N	197	197

(Source: Primary data)

This result also indicates a weak correlation (r=0.061; p=0.398) that was not statistically significant. The implication is that student time was not positively related to ICT up-take at the college. Whence, ICT uptake in National Teachers' College, Kaliro is not significantly related to student time. Overall, the research hypothesis that there is a positive contribution of user involvement to ICT up-take at National Teachers' College, Kaliro was rejected.

Discussion

The educational changes that have resulted from the uptake of ICT have created both advantages and challenges for most educational institutions. On one hand ICT is a promising mechanism for instructional approaches, and on the other, it demands institutional capacity building and investment in human resources. This demand calls for a more involving role from the users. The study, aimed at assessing the contribution of user involvement to ICT uptake at National Teachers' College, Kaliro. From descriptive statistics, the study findings indicated weak user involvement. This complies with Boakye, & Banini (2008) who have suggested that weak user involvement has often been one of the impediments to technology adoption and diffusion in both developing and developed countries. Additionally, Newhouse

(1999) points out, rarely are teachers given the time or encouragement to reflect on their beliefs about learning or consider implementing new learning.

On the factor of staff time the study returned a very weak and insignificant relationship between staff time and ICT uptake, since the innovation of teaching using ICT is quite recent in National Teachers' Colleges. This agrees with the OTA report which states that: "*Probably the greatest barrier to technology use, however, is simply lack of teacher time – time to attend training, to experiment with machines and explore hardware, to talk to other teachers about what works, and plan lessons using new materials or methods."* (OTA, 1995). This finding is reflected further in Myhre (1998), who reports that, teachers initially focus on their own interaction with new medium, and as they gradually become comfortable they start deliberating upon potential learning benefits that would result from the use of computers.

On student time as a factor of user involvement dimension, while the study indicated that time was available, there was a great impediment of the high student to computer ratio and lack of ICT competence among staff. These findings agree with Oliver, and Towers (2000) who contend that in the past students have typically been forced to accept what has been delivered and institutions have tended to be quite old fashioned and traditional in terms of delivery of their programs. The correlation results revealed no significant relationship between student time and ICT up-take. The implication is there are other factors in National Teachers' College, Kaliro contributing to the limited ICT up-take other than student time.

Recommendations

On the basis of the study's purpose and the emerging results, it is recommended that National Teachers' College, Kaliro and other teacher training institutions must give attention to user involvement because of their value in fostering ICT up-take. The Ministry of Education

should ensure Staff is trained in ICT led instructional approaches, resourced, and appropriate policies put in place.

National Teachers' Colleges, and the Uganda Ministry of Education and sports (MoES) must not only provide for core and examinable subjects, but should clearly come out to provide ample time for the integration of ICT in education. This should be implemented through a clear policy on timetabling and examinations.

The college should involve staff in decision making about ICT literacy. The college and Ministry of Education should provide a clear policy on continuous professional development courses that are tailored towards use and integration of ICT in the teaching/learning process. A critical area is the College and the Ministry should provide ample funds to train staff on how to use Computer Based Training, with emphasis on E-learning and also purchase more computers to correct the bad situation of the high student to computer ratio.

The college should involve students in decision-making about ICT and increase access to computers. The College should change from the traditional pedagogical approaches of delivery to Active Teaching and Learning enhanced by a digital environment.

For future research, given that the study envisaged ICT up-take as something involving attitude towards computers, perception about ICT attributes, ICT competence, and ICT skills, other studies could look at an in-depth study of how the Independent Variable – user involvement relates to each of the dimensions of ICT Uptake. Findings pointed to the fact that ICT infrastructure in National Teachers' College Kaliro is still in its infancy, so other studies could look at institutions with good computer infrastructure.

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