

Assessing the attitudes of secondary school teachers towards the integration of ICT in the teaching process in Kilimanjaro, Tanzania

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ABSTRACT

Information and communication Technology (ICT) can possibly change the teaching and learning process. ICT can enhance the educators' plan work, enhancing students learning process and thus improve the academic performance of students. This study assessed the Attitudes of Secondary School Teachers towards the Integration of Information and Communication Technology in the Teaching process in Kilimanjaro Region, Tanzania. A Cross-sectional Survey design was employed. The sample consisted of Hundred (100) teachers from ten (10) secondary schools. Interview schedule, questionnaires and observation schedule were used as research instruments. Data were analyzed using descriptive and inferential statistics. The study found out that both male and female teachers had positive attitudes towards integration of ICT in their teaching process. Furthermore, it was reported that there is a relationship between a teacher's age group and attitudes towards integration of ICT in teaching process and learning process. On the basis of these findings, the study concluded that ICT integration into the teaching process largely depended on the attitude of teachers and student concerning ICT integration; positive ICT attitudes are expected to foster ICT integration in the teaching and learning process. The study recommended that curriculum developers should integrating ICT into a curriculum with an account of economic, cultural, political, social, educational and catalytic rationales.

Keywords: *teachers' attitudes, information and communication technology, ICT integration*

INTRODUCTION

An innovative teaching process is important for attaining the desired knowledge, skills, values and attitudes. The World Education Forum (WEF) held in Dakar Senegal of 2000 call upon all countries to introduce innovations in the teaching and learning process so as to improve all aspects of the quality of education provided in their respective societies. In this respect the integration of ICT into the teaching process is said to be an innovation aimed at facilitating the effective and efficient teaching and learning process in secondary schools.

ICT integration into classroom teaching and learning helps to achieve the goals of educational programs for several reasons. Miima, (2013) has explained that the advantages of ICT appear to be appropriate for adapting to the issue of basic education and innovative proficiency, particularly in the poorest populace segments which is the situation in most African nations. He contends that ICT integration into the teaching and learning process makes the educative process more proficient and additionally fascinating to students in this way enhancing the quality of education.

Shamimul and Fouji, (2010) has also reported that ICT offers an improved potential for systematization of knowledge about teaching and for innovation in teaching process through being able to convey knowledge anytime and anywhere; "the importance of ICT into classroom instruction support, facilitate and make easier teaching-learning process" (Youssef and Dahmani,2008). Accordingly, Youssef and Dahmani, (2008) ICT integration stimulate a new atmosphere where teaching and learning process is conducted in an interactive and collaborative manner.

Teachers' perception and attitudes have been pointed out in literature as an important component in the integration of ICT in teaching and learning. Teachers are expected to adopt and use ICTs appropriately in their teaching hence implement the changes expected in pedagogy. This is to say successful implementation of ICT depends mostly upon teachers' attitudes, perception and competence in the integration of ICT into the teaching process.

Research reveals different attitudes of teachers toward ICT integration. Studies by Korte & Husing (2007) and Oldfield (2010) as cited in Oboegbulem and Ugwu,(2012), Blanknskat et al (2006) and Becta (2008) have revealed that despite the benefits of ICTs in teaching and learning, there is still a small group of teachers who do not see any significant advantage to the teaching process while using ICTs. Kearsley, (2004), however reported that a good number of teachers in high school have positive attitudes towards the use of ICT in their educative activities. Lauman (2000) in Kearsley, (2004) also reported that most teachers believe that ICT helps them to develop cognitive skills in their daily teaching process, to be professionals in organizing subject content and in enabling a creative learning atmosphere.

Edefiogho, (2005). has further indicated that there is a significant difference in ICT application based on teachers' gender and experience; young and newly employed female teachers reported higher technology use in teaching and learning process. Similarly Hassan and Abdullah (2011) reported that there is a difference between male and female teachers in using ICT in language teaching; female teachers reported higher use of ICT in their instruction than male teachers. The findings correlate with those of Kulik, (2003) and Berhane (2012) who also reported that secondary school teachers have different attitudes towards the use of ICT in the teaching process; different perceptions were reported according to teachers' age and gender.

The government of Tanzania recognizes that the use of and integration of ICT in secondary school education is an important element. In its ICT policy of 2005, MOEVT asserts that ICT instructional use is vital to the growth of students' thinking capacity. As such, secondary schools in the country have been advised to seek the benefit from ICT. To be able to do so, secondary school ICT policy has been developed and both teachers and students have been encouraged to integrate ICT so as to meet the required competencies of the ever-changing global environment.

Considering these rationales and based on the strong emphasis by MOEVT that teachers integrate ICT into the teaching and learning process, it is important to study the attitudes of Secondary School Teachers towards the Integration of Information and Communication Technology in the Teaching process. Inquiry into the extent of integration, attitudes of teachers towards integration of ICT into teaching process is very important in as far as predicting the integration process is necessary. Therefore, it demonstrates the need for further study to investigate the Attitudes of Secondary School Teachers towards the Integration of Information and Communication Technology in the Teaching process in Kilimanjaro region.

THEORETICAL FRAMEWORK

The study adopted Theory of Rate Adoption by Rogers (1995) because it describes how an innovation is adopted and/or integrated into a formal organization. Thus this theory is related to this study on attitudes of teachers towards ICT integration into the teaching and learning process. The theory of Rate Adoption holds that the integration and/or adoption of an innovation grow slowly and gradually in the beginning and then have a period of rapid growth that will narrow and become stable and eventually decline (Rogers, 2003). This theory also considers time and attitudes about the innovation. Innovations are understood to be interconnected across space and time. Furthermore the adoption of an innovation is regarded as a mental activity that develops

over time. An attitude about the innovation afterward impacts the choice of whether to adopt or reject the innovation.

This theory helped the study in understanding that ICT integration into the teaching process depends on the attitudes of those involved that is both students and teachers. Furthermore the study was enriched by this theory's assertion that attitudes towards the innovation influence the decision of whether to adopt or reject the innovation.

STATEMENT OF THE PROBLEM

Different scholars for example Oboegbulem and Ugwu, (2012), Yusuf and Afolabi, (2010), and Edefiogho, (2005) have argued that ICT innovations in the teaching process make teachers to be more aware of global events, foster teacher' creativity and work performance, and help them to be more creative and focused in creating learning environment in which an effective and efficient teaching and learning process is conducive.

Despite the benefits of ICT integration into the teaching and learning process empirical studies done outside of Tanzania and Kilimanjaro region in particular reveal different attitudes of teachers toward ICT integration into teaching and learning process based on gender and age. Korte and Husing (2007 reports contrasting perceptions of teachers based on age about ICT use in teaching process. Similarly Baek and Kim, (2008) indicate a significance difference between male and female teachers in using ICT in their teaching process.

Few studies have been conducted in Tanzania on the attitudes of Secondary School Teachers about the Integration of Information and Communication Technology in the Teaching process in secondary schools. Thus, additional research is needed to investigate the attitudes of Secondary School Teachers about the Integration of Information and Communication Technology in the Teaching process. Therefore, this study investigated the Attitudes of Secondary School Teachers towards the Integration of Information and Communication Technology in the Teaching process in Kilimanjaro Region, Tanzania.

RESEARCH OBJECTIVES

This study was guided by the following research objectives:

1. To assess the extent to which ICT has been integrated into the teaching process in secondary schools in Kilimanjaro Region
2. To describe the attitudes of teachers towards integration of ICT into the teaching process in secondary schools in Kilimanjaro Region
3. To list the factors influencing the integration of ICT into the teaching process in secondary schools in Kilimanjaro Region

RESEARCH HYPOTHESES

The following research hypotheses stated alternatively were tested:

1. There is a relationship between a teacher's gender and attitudes towards integration of ICT in teaching and learning process
2. There is a relationship between a teacher's age group and attitudes towards integration of ICT in teaching and learning process

SIGNIFICANCE OF THE STUDY

This study informs educational stakeholders such as parents, government, curriculum developers, and school administrators on teachers' attitudes towards ICT usage in teaching process, the extent of ICT integration into the teaching process and factors influencing the rate of ICT integration into the teaching process in secondary schools. If, as Eccles (1987) has argued, 'task value' beliefs are central to explaining the nature of students and teachers' attitudes teaching and learning particular subjects, then this study helps in identifying those tasks which are viewed positively, such factors as teachers' attitudes towards ICT and the former's effects on the extent of integration in the teaching process. This study therefore documents findings on the attitudes of secondary school teachers towards the integration of ICT in the teaching and learning process, and hence a reference for future studies.

SCOPE AND DELIMITATION OF THE STUDY

This study was limited to the views of secondary school teachers of Kilimanjaro region in studying their attitudes towards the Integration of Information and Communication Technology in the Teaching process. Furthermore, the study was confined to ICT variables such as: use of computers, overhead projector for PowerPoint presentation, and use of internet to process data for the teaching process.

OPERATIONAL DEFINITION OF TERMS

Information and communication technology (ICT): Computer and telecommunication application: radio and television, computers, internet, PowerPoint presentation, word processing etc. It is the electrical means of sharing information.

ICT integration: The process of using ICT related facilities e.g. internet, PowerPoint presentation, word processing, computer in the teaching process.

Attitudes: Teachers thinking or feeling about ICT integration in the teaching process as measured on and/or by the attitude scale.

RESEARCH DESIGN AND METHODOLOGY

i. Research Design

The study used both qualitative and quantitative research paradigms. As argued by Cohen et al (2011), by mixing both quantitative and qualitative research and data, the researcher gains in breadth and depth of understanding and corroboration, while offsetting the weaknesses inherent to using each approach by itself. A cross-sectional survey was employed. A cross sectional survey design helped the researcher to quantitatively describe and report the attitudes of teachers towards the integration of ICT into the teaching process in secondary schools of a large group understudy.

ii. Population

The target population of this research included all secondary schools in Kilimanjaro Region, and all teachers in secondary schools in Kilimanjaro Region.

The sample consisted of one hundred (100) respondents from ten (10) secondary schools with each school providing ten (10) teachers. Secondary schools were sampled using stratified random sampling technique. Hundred (100) secondary school teachers were selected from the sampled secondary schools using convenience sampling technique.

iii. Research instrument

This study used three types of research instruments: structured observation schedule, interview schedule, and questionnaires. Structured observation schedule was used to gather “live” data on how the teachers integrated ICT into the teaching process. Classroom observation was conducted in five (5) classrooms and 25 minutes was used in each classroom. Questionnaires which composed of both open ended, closed ended, and questions on a Likert scale were administered to get numerical data on the extent of ICT integration in the teaching process. Interview scheduled was used to get narrative clarification of teachers’ views concerning the study questions.

iv. Determining validity and reliability evidence of the instruments results

Validity evidence of research instruments was determined by a panel of expert comprising of three (3) teachers and 2 specialists in educational research. The specialists were asked to study and understand the construct and content domain that an item or a section of the questionnaire was supposed to measure. A reliability test was carried out to determine the internal consistency of the items in the questionnaires by using Cronbach’s Alpha reliability test. Cronbach’s alpha coefficient was 0.799.

v. Data collection procedures

A letter of introduction was obtained from the Regional Educational Officer who gave permission to visit the sampled secondary schools. A copy of permission granted was presented to sampled secondary schools. Questionnaires were delivered personally to the teachers in the staff room of which thirty minutes were given to respondents to complete the questionnaires and thereafter collected after the stipulated time. A 7 minutes interview schedule was conducted to 35 teachers. Classroom observation was conducted for forty minutes so as to get familiar with actual integration of ICT in the teaching process. Data was then summarized and for analysis.

vi. Data analysis

Data were analyzed using frequencies, percentages, means and standard deviations. Hypotheses were tested using t-test for independent samples and ANOVA at 0.05 confidence level.

FINDINGS

1. Extent to which teachers have integrated ICT into the teaching process in secondary schools in Kilimanjaro region.

In order to describe the extent to which ICT has been integrated into the teaching process in secondary schools in Kilimanjaro region, respondents were asked to rate the extent to which the listed ICT related activities are carried out in the teaching and learning activities on a four-point scale ranging from “*very often* (4), *often* (3) *sometimes* (2) and *not at all* (1)”. Table 1 shows the extent to which ICT related skills are carried in the teaching process by teachers.

As shown in Table 1 majority of teacher respondents were more in use of word processor (very often=33% , use of internet (very often=27%, often =47%), showing film chips(very often 26%, often=40%). On the other hand, the least used ICT related facilities was students use of computers (not at all=46%, sometimes=40%) and demonstration by using DVDs or CD-ROMS= sometimes=47%, not at all = 29%). Bingimlas, (2009) also found out that Word processor, use of search engine, are often used by both teachers and students in the teaching and learning process and hence create a good environment for ICT integration in teaching and learning process.

Table 1: The extent to which ICT related activities are carried out by teachers in the teaching process

ICT SKILLS	<i>n=100</i>							
	VERY OFTEN		OFTEN		SOMETIMES		NOT AT ALL	
	F	%	f	%	f	%	f	%
Word processor (e.g. Microsoft word)	33	33.0	31	31.0	25	25.0	11	11.0
Presenting starter activities	11	11.0	9	9.0	52	52.0	28	28.0
Visual display	18	18.0	27	27.0	37	37.0	18	18.0
Use of Microsoft PowerPoint	8	8.0	21	21.0	49	49.0	22	22.0
Use of Search engines (e.g. Internet/WWW)	27	27.0	47	47.0	20	20.0	6	6.0
Demonstration(e.g .DVDs or CD- ROMS)	8	8.0	16	16.0	47	47.0	29	29.0
Student's use of computer	14	14.0	14	14.0	40	40.0	46	46.0
Showing film chips	26	26.0	40	40.0	34	34.0	-	-

Simonson, (2004) study's also reported that most teachers often use the internet to check for learning materials. Similarly Lau and Sim (2008) results shows that the ICTs most commonly used by teachers were word-processing, PowerPoint and the World Wide Web. It was further indicated that video conferencing, synchronous communications, databases or text reconstruction software were seldom used. The study reported that lack of technical support was perceived by teachers as the key barrier to the further uptake of ICT in schools; the teachers who had been using ICT extensively in their daily routines still indicated high training and support needs.

One possible interpretation to the results above is that word processor and use of search engine are the most easy to learn ICT applications and are considered to be important ICT integration variables. This implies that teachers should acquire the basic knowledge of how to use word-processing, and use of search engine for them to integrate ICT into the teaching and learning process.

The classroom observation indicated that a good number of teachers in secondary schools in Kilimanjaro region are not competent enough to integrate ICT into classrooms.

This implies that teachers require ICT training both at pre-service and in-service levels. Teachers can be trained on how to use ICT and ICT is important as a means of training process. The integration or the use of ICT in teaching and learning process is dependent on teachers and students' readiness in order to be successful. Teachers' and students' readiness to integrate ICT is the most important factor that has a direct impact on ICT integration. Thus policy makers and curriculum developers should consider addressing issues of computer readiness among teachers and students in secondary schools so as to aid the integration process.

2 Attitudes of teachers towards integration of ICT into the teaching process in secondary schools in Kilimanjaro region.

The study wanted to investigate the perceptions of teachers about integration of ICT into the teaching and learning process in secondary schools in Kilimanjaro region. Teachers were asked to respond to statements using a five point of 12 items Likert scale of "strongly agree (SA)-5, agree (A)-4, undecided (U)-3, disagree (D) - 2, strongly disagree (SD) -1, and no response (NoRS). For negative statements the order was reversed. The results from a Likert scale were summarized in terms of the total positives and negative statement answered. Teachers who scored high on the items in the attitude scale were assumed to have a positive attitude towards the integration of ICT into teaching and learning process and those teachers who scored low on the items in the attitude scale were assumed to have a negative attitude towards the integration of ICT into teaching and learning process. The maximum score was 60 marks; the scores were categorized as: 12- 28 = negative attitude towards integration of ICT into teaching process, 28-44 = moderate attitude towards integration of ICT into teaching process, and 44-60 = positive attitude towards integration of ICT into teaching process. Table 2 shows the distribution of the total number of positives and negative attitudes answered according to teachers' gender.

Table 2: Distribution of positive and negative attitudes answered according to teachers' gender

Gender	Positives attitudes		Negatives attitudes	
	f	%	f	%
Male	43	43	8	8
Female	39	39	10	8
Total	82	82	18	18

As observed in Table 2, out of 100 teachers who responded to the attitude scale, 82 scored above 44 and 18 below 28. Since the total number of positive statements of male teachers and female teachers is 82%, this means that teachers have positive attitudes towards integration of ICT into teaching process. Additionally, classroom observation indicated that 7(70%) out of 10 teachers observed during their teaching and learning process conducted their teaching process using ICT components such as PowerPoint and visual displays. On the other hand 3(30%) of the teachers were observed to be indifferent in applying the ICT in their teaching process. These findings complement the results on the Likert scale were 82% of teachers indicated to applying ICT components in the teaching process. The results agree with Keengwe & Onchwari (2008) who concluded that high school teachers have positive attitudes towards integration of technology in the teaching process.

This implies that teachers' attitude towards integration of ICT in schools is very positive; they see ICT as an important part of their teaching process. And hence it will be easy to integrate ICT into the teaching and learning process in secondary schools. Shahan (1976) argues that one important concept of school reform is the human element, which embraces emotions, feelings, needs, beliefs and pedagogical assumptions. Similarly, Fullan's (2000) theory of school change also emphasizes that the alteration of mindsets, such as pedagogical assumptions, values and beliefs, is a key factor to any educational change effort. Watt (1980), as cited in Teo (2008) states that beliefs and attitudes play a fundamental role in the way that teachers and students

deal with ICT integration in the teaching and learning process. In other words, dealing effectively with ICT relates not only to knowledge of the capabilities, limitations, applications, and implications of ICT, but also to individual attitudes regarding ICT tool; the more positive teachers' attitudes on ICT integration, the faster and more effective the process of ICT integration into the teaching and learning process.

Table 3 and 4 shows the mean attitudes towards integration of ICT in teaching process score by age and gender.

Table 3: the mean attitudes towards integration of ICT in teaching process score by age

Age	Mean	n	SD
27-32	57.84	53	1.21
32-37	55.22	37	2.10
38 and above	52.34	10	3.26

Additionally results in Table 3 shows that the mean attitudes score of teachers of age 27-32 is 57.84 of SD 1.21, while for those above 38 years is 52.34 of SD 3.26. These results are in consistent with the findings of Lee (1997), Teo (2008), and Yaghi (2001) who in their respective studies reported that younger teachers who come straight from college or university have positive attitudes towards ICT use in the teaching and learning process than older teachers. This means that younger teachers have more positive attitudes towards the use of ICT related components in the teaching process than older teachers. The possible interpretation is that many teachers of 'advanced age' were not exposed to ICT related facilities during their time in universities/ college and as a result may lack a "techno how" computer skills and hence may develop negative attitudes towards ICT use in their teaching process.

Table 4: the mean attitudes towards integration of ICT in teaching process score by gender

Descriptive statistics			
Gender	n	Mean	SD
Male	50	54.20	3.6
Female	50	53.71	3.8

Data in Table 4 indicates that, mean attitudes score of males is 54.20 of SD 3.6, while mean attitudes scores of females is 53.71 of SD 3.8. This means that both male and female secondary school teachers have positive attitudes towards ICT integration into the teaching process though their attitudes vary slightly. The results agree with the findings of Miima, (2013), Berhane (2012) and Zakaria (2001) who respectively reported that both male and female teachers have positive attitudes toward IT, their IT use in teaching, and the availability of IT. This implies that teacher's gender is not an influencing factor in as much as ICT integration into the teaching process is concerned.

3. Factors influencing the integration of ICT into the teaching process

Concerning factors promoting the integration of ICT into the teaching process, factors such as support from school administration, Technical support, Access to ICT infrastructure and resources, teaching experience, Computer self-efficacy, ICT competence, teachers' and students attitudes towards ICT integration, and personal characteristic were listed by respondents. Becta (2004) also reported that if there is a lack of technical support available in a school, then it is likely that technical maintenance will not be carried out regularly, resulting in a higher risk of technical breakdowns and hence negatively affecting ICT integration. Similarly, Yusuf and Afolabi, (2010) reported that in providing schools with hardware and internet connections, it is also crucial to provide the schools with technical support with regard to repair and maintenance for the continued use of ICT in schools.

Therefore, if there is no technical support for teachers and students, they become frustrated resulting in their unwillingness to use ICT in their teaching and learning. Also Personal characteristics such as educational level, age, gender, educational experience, experience with the computer for educational purpose and attitude towards computers can influence the adoption of a technology, Schiller (2003). Similarly attitudes of teachers and students towards ICT integration greatly influence their adoption and integration of computers into their teaching and learning. According to Russell & Bradley (1997), anxiety, lack of confidence and competence and fear often implies ICT takes a back seat to conventional learning mechanisms. Therefore, an understanding of personal characteristics that influence teachers' adoption and integration of ICT into teaching is relevant.

To successfully initiate and implement educational ICT into the teaching and learning process depends strongly on the teachers and students' attitudes. It is believed 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. Among the factors that influence successful integration of ICT into teaching are teachers' attitudes and beliefs towards technology (Keengwe and Onchwari, 2008). If teachers' attitudes are positive toward the use of educational technology then they can easily provide useful insight about the adoption and integration of ICT into teaching and learning processes.

Furthermore Computer competence is regarded as most important in ICT integration into teaching and learning. Berner (2003) has reported that teachers' and students' computer competence is a major predictor of integrating ICT in teaching. Berhan (2012) reported that majority of teachers who reported negative or neutral attitude towards the integration of ICT into teaching and learning processes lacked computer competence that would allow them to integrate ICT. According to Liaw, Huang and Chen (2007), computer self-efficacy influences the use of ICT in teaching and learning. Similarly, (Yuen & Ma, 2008) revealed that teachers' implementation of ICT was depended on simplicity of computer use and perceived teacher self-efficacy. Also Becta (2004) stated that many teachers who are not well skilled in using ICT feel anxious about using it in front of students who perhaps know more than they do. Lack of Computer self-efficacy may influence students and teachers use of computers in teaching and learning.

Concerning factors preventing the integration of ICT into the teaching process, respondents identified the following factors which were categorized into two: school based (internal) and teachers' based factors. Under school based factors respondents listed factors: lack of commitment for implementation of ICT integration into the teaching and learning process, lack of ICT facilities in school, and unclear government policy on integration of ICT in secondary schools. Under teachers' and students' factors the following factors were listed: computer experience,

teachers' attitude/ perception towards the use of ICT, teachers' knowledge and skills about ICT, low motivation and lack of confidence in using new technologies in teaching, and limited access to ICT facilities. Table 5 shows the frequencies and percentages of the responses from the respondents about the factors preventing the integration of ICT into the teaching process.

Table 5: factors preventing the integration of ICT into the teaching process

n=100		
	f	%
school based factors	63	63
teacher's and student's personal issues	37	37
Total	100	100.0

Table 5 shows that 63% of respondents' perceived school based factors as the main factor preventing the integration of ICT into the teaching process. This could negatively affect the integration and provision of ICT, and teachers' perceptions about integrating ICT in their teaching process. The observation schedule also indicated that secondary schools in Kilimanjaro region faces challenges such as inadequacy of ICT infrastructure (hardware, software, and limited internet access), sporadic electricity, and lack of teachers qualified in ICT. In the questionnaire, one participant explained that problems or inhibiting factors could be avoided but some can be reduced. Some are natural while some are school failures. *"The greatest problems I have ever met during my teaching career as a teacher is, however, was not lack of ICT access, lack of expertise or awareness, but absence of incentive, lack of adequate time and unclear ICT integration policy."*

The results are consistent with the findings of Vimbai et al. (2013) and Balanskat et al. (2006). Vimbai pointed out that lack of a clear sense of direction on how to use ICT to enhance the learning of students, inadequate resources and support as well as lack of the required technological skills among the teachers. Balanskat showed factors that impede the successful implementation of ICT in teaching: teachers' poor ICT competence, low motivation and lack of confidence in using new technologies in teaching, limited access to ICT, poor quality and inadequate maintenance of hardware as well as unsuitable educational software which were also defining elements in teachers' levels of ICT use.

By implication, teachers' and student's ICT competence, positive perception about ICT integration, positive motivation and confidence in using new technologies in teaching and learning, access to ICT facilities, a clear sense of direction on how to use ICT to enhance the learning of students are very important variables whenever ICT integration is concerned. MOEVT should therefore take an understanding and thereof address these factors which prevent the integration of ICT into teaching process.

In line with this, it is partly indicated that if vision on the use of ICT is successfully created, then the next step will be to articulate the integration of ICT to teachers. A clear ICT integration policy is important to effective ICT integration. Teachers need to be assured that technology can make their teaching process interesting, easier, more fun, more motivating and more enjoyable. Similarly, when teachers are encouraged to use ICT and contribute into school's ICT plan, ICT integration will likely occur promptly.

TESTS OF HYPOTHESES

Assumptions

Hypotheses testing were done using t-test and ANOVA. The assumptions for t-test independent and ANOVA were taken into consideration and were based on the following decision rules: Given a significance level of 0.05:

If the observed P. value is greater than 0.05, do not reject the Null hypothesis.

If the observed P. value is less than 0.05, reject the Null hypothesis.

The following hypotheses stated from null hypothesis were tested:

Ho 1: There is no significant difference between the mean attitudes towards integration of ICT in teaching process scores of male and female teachers.

Ho 2: There is no significant difference between the mean attitudes towards integration of ICT in teaching process scores of teachers of different age groups.

RESULTS

Ho 1: There is no significant difference between the mean attitudes towards integration of ICT in teaching process scores of male and female teachers

Table 6 shows t-test Summary Table of the relationship between gender of teachers and attitudes towards integration of ICT into teaching process.

Table 6: t-test Summary Table

Gender of teachers	Descriptive statistics			Independent t-test		
	n	Mean	Std. Deviation	t	Sig.	df
Male	47	43.07	4.10	-.749	.392	92.106
Female	53	43.62	4.41			

Since the $P > 0.05$ (that is $p = .392$), we accept the Null hypothesis. Therefore, there is no significant difference between the mean attitudes towards integration of ICT in teaching process scores of male and female teachers. This means that there is no relationship between a teacher's gender and attitudes towards integration of ICT in teaching and learning process. This entails that both male and female teachers perceive ICT as an important part of the teaching process.

These results are in contrast to what Hassan and Abdullah (2011) and Kulik, (2003) reported that different genders of secondary school teachers have different attitudes towards the use of ICT in the teaching process. However this finding agree with the results of Zakaria (2001) who reported that both male and female teachers have positive attitudes toward IT, their IT use in teaching, and the availability of IT. Similarly, Miima, (2013) and Berhane (2012) reported that high school teachers across gender share similar thoughts and perception about the usefulness of ICT in their teaching process. The results imply that the gender factor of secondary school teachers does not have a pivotal role in the integration of ICT into the teaching process. If both male and female

teachers perceive ICT as neither fulfilling their own needs, but that of the teaching process, it is likely that they will integrate the ICT into teaching process.

Ho2: There is no significant difference between the mean attitudes towards integration of ICT in teaching process scores of teachers of different age groups

Table 7 shows the ANOVA summary Table of teachers' age and attitudes towards integration of ICT into teaching process.

Table 4: ANOVA Summary Table

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	593.472	2	286.469	17.791	.001
Within Groups	1292.457	96	12.967		
Total	1885.929	98			

Since the P value ($P < 0.05$) was less than 0.05 (that is .001), we reject the Null hypothesis. Therefore, there is a significant difference between the mean attitudes towards integration of ICT in teaching process' scores of teachers of different age groups. This means that there is a relationship between a teacher's age group and attitudes towards integration of ICT in teaching process.

These results are in consistent with the findings of Lee (2003) Teo (2008) and Yaghi (2001). Lee (1997) as cited in Becta (2004) pointed out that many teachers of 'advanced age' will not have any computer education when in college, and as a result are in need of computer skills training to allow them to make use of computers in their work. Teo (2008) reported the pre-service teachers' attitudes for computer use were influenced by their age, and Yaghi (2001) found that older teachers were less confident with using computers.

One possible interpretation for the results could be that young teachers within the age group of (25-30, and 31-36) have grown up in the digital world and are more exposed to ICT tool when in university/ college where most of the learning process is incorporated with ICT as compared to aged teachers (between the age group of 37 and above) who grow up or attended university or college when ICT was still not thought of as part of the teaching and learning process.

By implication, the teacher's age has an effect on the integration of ICT in the teaching and learning process. This is to say that young teachers may be more familiar with ICT skills than aged teachers; higher the age, the greater the resistance becomes. Young teachers tend to be friendlier with ICT materials for usage in their classrooms. Thus when planning, developing, and adopting ICT into the teaching and learning process, MOVET has to consider that teachers' perception about ICT is related to their age among others factor; teachers' perceptions and beliefs influence successful integration of ICT into teaching. If teachers' attitudes are positive toward the use of educational technology, then they can easily provide useful insight about the adoption and integration of ICT into teaching and learning processes. As explained by Woodrow (1992) for successful transformation in educational practice, user needs to develop positive attitudes toward the innovation.

CONCLUSIONS

On the basis of the findings of this study, the following conclusions are made:

1. The integration of ICT into teaching process largely depended on the attitude and perception of teachers concerning ICT integration; positive ICT attitudes are expected to foster ICT integration in the teaching process.
2. There is a relationship between teachers' gender, age group and attitudes towards ICT use in the teaching process. Both male and female teachers view ICT as important aspect in the teaching process. However, this perspective is different in as far as age group is concern.
3. The extent of ICT integration into the teaching process is fostered by a clear school policy on ICT integration, teachers' technical how, and presence of ICT facilities in schools.
4. Inadequacy of ICT infrastructure such as hardware, software, limited internet access, sporadic electricity, and lack of teachers qualified in ICT are some of the factors preventing the integration of ICT into teaching and learning process in secondary schools. The factors which prevent the integration of ICT are key aspects which educational institutions should address before implementation of ICT integration into teaching and learning process is considered.

RECOMMENDATIONS FOR POLICY AND PRACTICE

Based on the conclusion of this study, the following recommendations are made:

1. Curriculum developers should promote' teachers positive perception/attitudes about ICT by integrating ICT into a curriculum with an account of economic, cultural, political, social, educational and catalytic rationales. They should consider that Information and communication technology (ICT) plays an indispensable role in a development of a society and society's adaptation to global technological expansion.
2. Ministry of Education and Vocation Training (MOEVT) should arrange for provision of ICT appliances in all secondary schools and thereafter encourage teachers to integrate their teaching activities with ICT; by conducting their teaching process using ICT appliances available in their respective secondary schools.
3. Secondary school teachers should make use of ICT facilities/ appliances such as use of desk-tops or laptops to type small class presentation using PowerPoint presentation in explaining complex subject matter. They should also encourage students to do their assignments using ICT components such as internet use, PowerPoint presentation.

RECOMMENDATIONS FOR FURTHER RESEARCH

Based on the findings of this research the following recommendations for further research are put forward:

1. Effects of ICT attitudes on ICT acceptance among secondary school students in Tanzania
2. Impact of ICT on educational achievement and its effectiveness in selected secondary schools in Tanzania
3. The Impact of the teachers' age, gender and experience factors on ICT integration into teaching and learning process in secondary schools in Tanzania

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