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Research Article

THE USE OF INFORMATION AND COMMUNICATION TECHNOLOGY (ICT) AND LEARNING COMPETENCES IN PRIMARY SCHOOLS

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Abstract

The development of learning competences in pupils is very important to all primary school teachers. The production and use of teaching and learning resources depends to a large extent on the competences and skills to be developed. The inability of primary school children to resolve basic life problems upon graduation motivated the researcher to carry out this study on the basis that the use of ICT can have a relationship with the development of learning competences in primary schools. The correlational research design was used. A questionnaire was used to collect data. The theory of Social Constructivism by Lev Vygotsky (1978) and Theory of Operant Conditioning by B.F Skinner (1904 -1990) were used to explain the problem of the study. The sample was made up of 150 teachers who are teaching using ICT in Yaounde V Sub-Division. The simple random sampling technique was used to select these teachers. Findings showed that there is a positive correlation between instructional planning using ICT, $r(148) = 0.441$, $(p < .001)$, lesson delivery with ICT, $r(148) = 0.417$, $(p < .001)$, assessment using ICT $r(148) = 0.370$, $(p < .001)$ and learning competence respectively. The study strongly recommends that ICT should be integrated in all learning areas to enhance learning competences in pupils. This will arouse learners' interest in learning and thus help them to developed competence.

Keywords: ICT, Teaching, Pedagogy, Learning, Competence, Primary schools.

INTRODUCTION

The rapid development of information and communication technology (ICTs) has transformed human society from information age to knowledge age (Galbreath, 2000). ICT devices such as computer, mobile phone, projector, television, radio, Encarta for kids have the potential to improve the quality of teaching and learning at all levels of education. The use of ICT in education has been widely discussed as far as the advancements in new technologies are concerned (Serin, 2011; Inan and Lowther, 2010).The use of ICT has become more common during the last two decades with the coming of the Internet and the World Wide Web. According to Pachler (1999),the Internet is fast becoming the largest collection of information in the world and more importantly, teachers can use the Internet to enhance teaching and learning, but this strategy needs to be well structured and sequenced (Pachler, 1999). The official programs of ICT in Cameroon were designed for secondary schools in 2003 and the Ministry of Basic Education developed a strategy for the implementation of the national ICT policy in basic education from 2007-2015 (ERNWACA-Cameroon, 2005). This strategy was developed to train teachers and school administrators in ICT and ICT integration in the curriculum. The guidelines for teaching ICT in Nursery and primary schools was also drafted with six different modules adapted to each level, from discovery and presentation of skills to applying these skills to knowledge construction and finally learning health and safety issues related to the use of ICT. The teacher modules include productivity and research, applying ICT to teaching and learning, evaluation, and lastly, social, moral, and human questions related to ethics and equality (République du Cameroun, 2007a).

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These strategies led to some innovations from the teacher centred pedagogies and memorization as a learning technique to a constructivist, pupil-centred method, with pupils taking more responsibility in the learning process (ERNWACA Cameroon, 2005). The problems of ICT integration in primary schools in Cameroon are almost the same with that of secondary schools (Nkwenti, 2015). ICT is implemented in primary schools in the form of pedagogic seminars organised by the Ministry of Basic Education through pedagogic inspectors and experts (Inspectorate General of Pedagogy 2004; Nkwenti, 2015).These seminars usually take place once in a term giving a total of 3 days per academic year, 18 hours of teaching effectiveness (Nkwenti, 2015). This is not enough because technologies evolve rapidly and lack of qualified teachers to teach using ICT in primary schools is related to the lack of technical assistance in schools with ICT laboratories (Nkwenti, 2015). Besides, when computer systems break down in some schools, it takes a longertime for authorities to repair them. Also since many classroom teachers do not have the opportunity to undergo professional development training programs, they feel frustrated and discouraged when they meet ICT challenges in schools (Nkwenti, 2015).ERNWACA-Cameroon (2010), and Nkwenti (2010), also noted that though 96.23 percent of Government primary school pupils are taught ICT lessons and 100 percent of Teacher Training Colleges teach ICTs to student teachers, a greater part of the training is still theoretical due to the lack of resources and infrastructure.

ICTs provide an open opportunity for educational institutions to harness and use technology to complement and support the teaching and learning process. Despite the enormous demands of ICT aided teaching and learning, the development of ICT programmes, investments and donations of ICT equipment to schools in Cameroon, primary school teachers still face challenges to develop pupils learning competences. This study provides insights about the relationship between ICT and

learning competences in primary schools. The following research objectives were designed to guide our investigation:

- To examine the effect of instructional planning using ICT on learning competences in primary schools.
- To investigate the effect of lesson delivery with ICT on learning competences in primary schools.
- To examine the effect of assessment with ICT on learning competences in primary schools.

Literature review

ICT (information and communications technology) involves any communication device or application, encompassing radio, television, cellular phones, computer network, hardware and software, satellite systems and so on, as well as the various services and applications associated with them, such as videoconferencing and distance learning (Mohamed Taher, 2015). It is also the set of activities which are facilitated by electronic means through the processing, transmission and display of information (Rodriguez and Wilson, 2000). ICT serves many roles in school with the aim of enhancing pupils' learning. Based on how ICT is used in the primary school classroom, Lim and Tay (2003), outline four types of ICT tools as follows:

- **Information tools:** These involve application tools which provide information in various formats such as text, sound, graphics or video. The examples of these applications are multimedia, encyclopaedias or resources available in the world-wide web.
- **Situational tools:** These involve systems that situate pupils in an environment where they can experience a context and happenings. These systems are simulations, game and virtual reality.
- **Construction tools:** These are tools that can be used for manipulating information, organising one's idea or representing one's interpretation. Examples of these tools are mind mapping or social networking applications that allow learners to organize ideas or think, reflect and communicate the ideas as well as share with others.
- **Communication tools:** They involve applications that facilitate communication between teacher and learners or among learners beyond the physical barriers of the classroom. Examples are E-mail, E-conferencing and E-discussion boards.

Technology-based teaching can be defined as the integration of ICT in the teaching learning process. ICT integration in schools especially in the classroom is very important because the use of ICT in education contributes a lot to the pedagogical aspects in which the application of ICT will lead to effective learning with the support of ICT tools and components (Jamieson-Proceter *et al.,* 2013).Technology-based teaching and learning provides various interesting methods and techniques which include educational videos, storage of data, simulation, mind-mapping, usage of databases, guided discovery, brainstorming, music, World Wide Web (WWW) that will make learning more interesting, meaningful and fulfilling (Ghavifekr and Alhirah, 2015, Finger and Trinidad, 2002). All subjects beginning from music, mathematics, science, language, arts, humanities and other major fields can be learnt more effectively with the use of ICT (Jorge *et al.,* 2003). According to Ellington (2006), integrated instructional media are produced from a combination of audio and visual media which include combined audio moving visual materials, audio still visual materials and combined mediated materials. Combined audio-visual materials are teaching learning materials produced from a combination of audio and still visual materials (Ellington, 2006). These media include tape slide programs, tape photograph programmes, filmstrips with sound, tape text and tape model/type realia. These materials in the classroom can be used for individualised learning situation, group learning and mass instruction (Ellington, 2006). Combined audio moving visual materials enable audio signal to be combined with moving visual sequence. The sequence currently available includes cine films, television broadcasts, video tape recording and video disc recordings. Films are good teaching aid for teachers and should be used in schools as a study medium and not as entertainment as often tend to occur (Victoria, 2015). Campbell (2009), Oberg and Gibson (1999), believe that with other technologies, the Internet is playing an important role in classrooms today and it is largely dependent on classroom teachers to ensure that all learners spend their time productively on the Internet (Wyld&Eklund, 1997). The teachers do not always feel they have adequate training to teach students using the Internet (Oberg and Gibson, 1999; Wyld and Eklund, 1997, Campbell, 2009). Davis (1992), carried out a study which shows that more than 50% of teachers who graduated from training schools felt that they are not prepared at all or are poorly prepared to teach using the Internet while 20% believe that they were adequately prepared to be able to use technology especially the internet for instruction (Davis, 1992, Campbell, 2009).

According to the Social Constructivist theory, learning is a collaborative process which is differentiated between two developmental levels which are actual development and potential development. The difference between these levels resulted to the identification of the "Zone of Proximal Development (ZPD)". The Zone of Proximal Development is the potential level of cognitive development a learner has if he or she is provided with the appropriate support. The process of learning, which is in a way related to the child's cognitive and social development (Palincsar 1998; Rice and Wilson, 1999), involves moving into and across the ZPD and looking forward to the next level of understanding, which will involve similar journey through a newly created zone (Pritchard, 2005). The process by which children can be taught within the ZPD is like the process of 'scaffolding' (Long, 2000). Social Constructivism has an impact on the pedagogies of ICT based instruction in the primary classroom. Through social interaction by the teacher and pupils using ICT tools, good teaching methods, strategies and skills, learning competences are developed with a collaborative process of actual development and potential development. Instructional design is a critical factor in the creation of effective online instruction (Desai, Hart, and Richards, 1998). According to Desai *et al.,* (1998), educators find that e-learning is much more labour intensive, and they must acquire unusual skills, experience, and dedication to be successful than comparable traditional learning. Focusing social interaction in relation to the teachers' pedagogical skills, Social Constructivist pedagogy, is also altered by the impact of ICT. According to Desai et al. (1998), each major transition in communication media from speech to print to video and to electronic form has resulted in changes in

teachers and pupils' means to create, record, store, distribute, access and retrieve information. Because of these changes, the social interactions between pupils and pupils, teachers and pupils have changed. Learners do not depend on the teacher as the main source of information and this can increase their level of thinking (Desai *et al.,* 1998). Web-based environments are important forums for joint problem solving, knowledge building and the sharing of ideas among teachers and pupils as well between pupils themselves (Nevgi, Virtanen and Niemi, 2006). With the theory of behaviourism, Operant conditioning (instrumental conditioning) is a learning process through which the strength of behaviour is modified by reward or punishment. A procedure is used to bring about such learning. Tanyi (2016), citing Skinner (1958), says operants are sets of responses that are emitted and governed by the consequences they produce. Skinner believed that we do have such a thing as a mind, but that it is simply more productive to study observable behaviour rather than internal mental events and that the best way to understand behaviour is to look at the causes of an action and its consequences (Tanyi, 2016).

Skinner (1958) found out that "behaviour is shown to be shaped and maintained by its 'reinforcing' consequences rather than elicited as conditioned or unconditioned response to stimuli". This idea is applied to ICT and learning competences in that reinforcement has had many implications for educational technology in the primary classroom. Sutton (2003) states that there are many aspects of Behaviourism that are positive and that have led to the development of important instructional technologies. These involve instructional software and computer-assisted instruction that are used for teaching and learning. Shields (2000) suggest the use of drill and practice tutorials, with individual instructions and feedback. This type of learning, where a child in primary school is rewarded through motivating comments before moving on to the next learning objective is especially apparent in the use of computer games that are so highly addictive to teenagers as their learning behaviours are being progressively rewarded as each level of the game is mastered (Shield, 2000). A child in primary school master basic technological terms, descriptions of components, and understand theory behind technical processes. This can be achieved through structured programs delivered through CD-ROMs or similar media (Shield, 2000). The use of reinforcements and rewards in the classroom where ICT is used both as a source of information and as a structure for learning simple skills and concepts can lead to the development of learning competences (Shields, 2000)

METHODS

This study employed a correlational research design. A questionnaire was used to collect data from the research participants. The Simple Random Sampling Method was used where every member of the population had an equal and independent chance of being selected. The participants for this study were made up of 150 primary school teachers selected from anglophone primary schools with multimedia centers in Yaoundé V Sub Division. Yaoundé V Sub Division is found in Mfoundi Division of the Centre region of Cameroon. This sample was selected using Krejcie and Morgan (1970), Instructional planning using ICT, lesson delivery with ICT, assessment with ICT and learning competences were assessed with a five-point Likert scale format to assess teachers' responses for each related section (1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree,5 = strongly agree). The face validity and content validity of the questionnaire were assessed. To ensure face validity, the questionnaire of this study after construction was submitted to experts in educational technology who scrutinized the items, checking appropriateness of language and clarity. After making the necessary corrections from these experts, the questionnaire was considered to have attained face validity. To establish content validity, the instruments were given to two experts or judges for proper scrutiny. Experts scrutinized the questionnaire and test items by checking the relevance of the items to the objectives of the study. From the results of the experts, the coefficient validity i.e. Content Validity Index (CVI) was calculated first after which the inter-judged coefficient of validity was calculated, and it stood at 0.90. The reliability of the instrument was determined using test-retest reliability. Before administering the questionnaire, they were first tested to a group of 30 teachers and after two weeks, the same questionnaire was still conducted to the same group of teachers. Their responses were correlated, and the results obtained indicated a high degree of consistency. Cronbach's reliability analysis was performed to test internal consistency of the variables. The reliability of instructional planning using ICT, lesson delivery with ICT, assessment with ICT and learning competences was assessed by Cronbach's alpha coefficient of about 0.85. Data was analysed using tables, percentages, charts, mean and standard deviations. The Statistical Package for Social Sciences (SPSS) version 25.0 for Windows was used for data analysis. To organize and give meaning to the data, various statistical tools: descriptive statistics, mean, standard deviation, the univariate analysis of variances (ANOVA), the Pearson Product Moment Correlation Coefficient and the Stepwise multiple regression analysis were used.

FINDINGS

The results on the average indicate that the variability of learning competences in the study was insignificant different for male ($M = 4.175$, $SD = 0.425$) and female ($M = 4.004$, $SD = 0.461$), $t(148) = 2.218$, ($p > 0.05$). Therefore, the gender of primary school teachers did not influence the development of competences in pupils. Table 3 presents the distribution of the mean and standard deviation of the respondents' opinions on instructional planning with ICT. From the table, we observed that respondents declared that they determined the method of assessment during instructional planning with ICT with the highest score ($M = 4.20$) which is supported by the fact that they identify learning objectives within a subject and available technology ($M = 4.14$). We also observed that primary school teachers examine the curriculum document and select the topic to teach ($M = 3.91$). They prepare lesson notes on every lesson before teaching in class **(**$M = 3.92$**)** as well as gather ICT resources required to achieve instructional objectives (3.83). The respondents also affirmed that they identify the ICT skills needed to complete a task in the classroom ($M = 3.79$) and decide how pupils will acquire new knowledge and skills **(**$M = 3.61$). The least scores were recorded where the respondents declared that they select a software programme needed for the lesson (3.42) as well as choose ICT based product for pupils to create (3.34) during instructional planning with ICT.

Table 1. Group Statistics for the development of learning competences by gender

	Gender	N	Mean	Std. Deviation	Std. Error Mean
Learning competences	Male	52	4,175	,4251	,0589
	Female	98	4,004	,4607	,0465

Table 2. Independent Sample t-test for learning competences

		Levene's Test for Equality of Variances		t-test for Equality of Means		
		F	Sig.	T	Df	Sig. (2-tailed)
Learning competences	Equal variances assumed	,030	,862	2,218	148	,028
	Equal variances not assumed			2,274	111,58	,025

Table 3. Respondents' opinions on instructional planning with ICT

Items (Alpha Reliability)	Mean	Std. Deviation
I examine the curriculum document and select the topic to teach	3,9067	1,06403
I identify learning objectives within a subject and available technology	4,1400	,81125
I determine pupils' background knowledge and existing ICT skills	3,5400	1,31399
I decide how pupils will acquire new knowledge and skills	3,6067	1,26330
I gather ICT resources required to achieve instructional objectives	3,8267	1,13957
I choose ICT based product for pupils to create	3,3467	1,14098
I outline the content that the ICT based product will contain	3,5067	1,07283
I select a software programme needed for the lesson	3,4200	1,22211
I identify the ICT skills needed to complete a task in the classroom	3,7867	1,00727
I determine the method of assessment	4,2000	,61306
I select the criteria to evaluate the ICT product with a focus on content, quality of information, lay out and ICT skills	4,0467	,85402
I prepare lesson notes on every lesson before teaching in class	3,9200	1,12040
N = 150		

Table 4. Respondents' opinions on lesson delivery using ICT

Items (Alpha Reliability)	Mean	Std. Deviation
I locate teaching strategies for diverse learners using Internet Browser	3,1067	1,25931
I create class website including syllabus and resources for pupils	2,9467	1,35005
I create instructional materials for pupils of diverse abilities and language levels using Word Processing	3,0933	1,26038
I provide examples for pupils in music/language classes using Cassette recorders, CD players and iPods	3,3267	1,23970
I use graphic organizer software to create unit concept maps and graphic organizers for pupils	3,0133	1,17574
I show films, documentaries using television to support lessons	3,1400	1,29547
I create documents, multimedia presentations using graphic software	2,9667	1,27662
I use animations, sounds, text, pictures, graphics, and interactive features to engage pupils in the classroom	3,6000	1,24782
I share pupils work and progress with parents; connect with absent pupils using Email, text messages, telephone calls	3,2000	1,23158
N = 150		

The distribution of the mean and standard deviation of the respondents' opinions on lesson delivery using ICT is observed in table 4. The highest number of primary school teachers use animations, sounds, text, pictures, graphics, and interactive features to engage pupils in the classroom (M = 3.60). They also use them during lesson delivery and provide examples for pupils in music/language classes using Cassette recorders, CD players and iPods (M = 3.33). They equally share pupils work and progress with parents; connect with pupils who are absent using Email, text messages, telephone calls (M = 3.20). It was also observed that the same number of respondents locate teaching strategies for diverse learners using Internet browser, show films, documentaries using television to support lessons (M = 3.14) and locate teaching strategies for diverse learners using Internet browser (M = 3.10) as well as show films, documentaries using television to support lessons (3.14). The least and lowest number of respondents declared that they use graphic organizer software to create unit concept maps and graphic organizers for pupils, create instructional materials for pupils of diverse abilities and language levels using Word Processing (M = 3.09). Table 5 describes the distribution of the mean and standard deviation of the respondents' opinions on assessment with ICT. It was observed that the respondents use quizzes: either fill-in-the-blank or matching items to definitions using Learning Management System (LMS) (M = 3.44) which was followed by the use of Excel software to analyse pre/post pupils' assessment data and word processing to create scoring rubrics for assessing pupils (M = 3,02). The use of digital video cameras to create examples for pupils' work; video their performance and analyse for improvement in music and language classes, record and discuss pupils' work and analyse for improvement using Digital Cameras scored (M = 2,85). The lowest score came from the taping of pupils' performances for student/peer evaluation using Cassette recorders, CD players (M = 2.70). Table 6 shows the mean and standard deviation of distribution of respondents' opinions on higher order learning skills (analysis, synthesis and evaluation) with ICT. It was observed that the highest score was where primary school teachers gave pupils the opportunity to present and define their own opinions (M = 4.31). They guide pupils to put parts together to form a whole, assist learners to make judgment about their own opinions and information, helped them to determine the quality of their work based on a set of criteria (M = 4.14). Next, was when they help pupils to determine the validity of ideas in class, help them to determine how the parts of information relate to one another, and help pupils to break information in to component parts in class (M = 4.08). The lowest opinions were when respondents guide learners to make inferences and find evidence to support generalizations and determine motives or cause of information with pupils in class and (M = 3.96).

Table 5. Respondents' opinions on assessment with ICT

Items (Alpha Reliability)	Mean	Std. Deviation
I record and discuss pupils' work and analyse for improvement using Digital Cameras	2,8400	1,32138
I use digital video cameras to create examples for pupils' work; video their performance and analyse for improvement in music and language classes	2,8533	1,27119
I use word processing to create scoring rubrics for assessing pupils works	3,0200	1,23413
I use Excel software to analyse pre/post pupils' assessment data	3,0733	1,22116
I tape pupils' performances for student/peer evaluation using Cassette recorders, CD players	2,7000	1,20819
I use quizzes: either fill-in-the-blank or matching terms to definitions using Learning Management System (LMS)	3,4467	1,07776

N = 150

Table 6. Respondents' opinions onlearning competences (skills)

Items (Alpha Reliability)	Mean	Std. Deviation
I help pupils to break information in to component parts in class	4,0867	,81871
I help them to determine how the parts of information relate to one another	4,0473	,82754
I determine motives or causes of information with pupils in class	3,8867	,90143
I guide learners to make inferences and find evidence to support generalizations	3,9600	,77615
I help pupils to build a pattern or structure from diverse elements	3,8533	,84652
I guide pupils to put parts together to form a whole	4,1067	,69656
I give pupils the opportunity to present and define their own opinions	4,3133	,66692
I help pupils to determine the validity of ideas in class	4,0933	,72673
I guide learners to make judgement about their own opinions and information	4,1333	,73882
I help them to determine the quality of their work based on a set of criteria	4,1467	,79754

N = 150

Table 7. The correlations between the study variables

		1 Instructional planning with ICT	2 Lesson delivery in the classroom using ICT	3 Assessment of pupils' learning with ICT	4 Learning competences (Skills)
1	Instructional planning with ICT	1			
2	Lesson delivery in the classroom using ICT	,349***	1		
3	Assessment of pupils' learning with ICT	,275***	,686***	1	
4	Learning competences (Skills)	,441***	,417***	,370***	1

Note : N = 150, *** = p<0.001

Table 8. Coefficients of the regression model for learning competences (skills)

Model		B	Std. Error	Beta	T	R^2	ΔR^2
1	(Constant)	2,495	0,265		9,42**	0,194***	0,194***
	Instructional planning With ICT	0,416	0,070	0,441***	5,97***		
2	(Constant)	2,356	0,255		9,25***	0,273***	0,079***
	Instructional planning With ICT	0,317	0,071	0,336***	4,48***		
	Lesson delivery in the classroom using ICT	0,162	0,041	0,300***	3,99***		

Note : N = 150, *** = p<0.001
Dependent Variable: learning competences

Table 7 above displays the correlation matrix of the study variables. The results show that there were major strong correlations between the study variables, namely between the independent variables (instructional planning with ICT, lesson delivery with ICT, assessment with ICT) and the dependent variable (learning competences). The results show that there was a significant positive correlation between instructional planning with ICT and learning competences, r (148) = 0.441, (p <.001). From this test result we can conclude that instructional planning with ICT significantly correlate learning competences in pupils. The results show that there was a significant positive correlation between lesson delivery in the classroom using ICT and learning competences in primary schools, r (148) = 0.417, (p < .001). From this result we can conclude that lesson delivery with ICT in the classroom significantly correlate the development of learning competences in pupils. The results finally reveal that there was a significant positive correlation between assessment of pupils' learning with ICT and learning competences, r (148) = 0.370, (p < .001). From this result we conclude that assessment with ICT significantly correlate learning competences.

This test-value gives a coefficient of determination of 0.137, meaning that 13.70% of the variability of pupils' learning skills is explained by assessment with ICT. After a multiple hierarchical regression analysis, table 8 presents the parameters of the model for the development of learning competences. The first model shows that R^2=0.194. This implies that the predictor variable (instructional planning with ICT) accounted for 19.40% of the variability of learning competences in pupils. The second model was a better one because, ΔR^2 =0.079. This implies that when added, the predictor variable (lesson delivery using ICT) accounted for 7.90% of the variability of learning competences. The table also presents the b-value estimates. These values indicate the individual contribution of each predictor to the model. Instructional planning with ICT significantly predicted learning competences in pupils, β = .336, t (148) = 4.48, p<.001, and lesson delivery in the classroom significantly predict learning competences, β = .300, t (148) = 3.99, p < .001. It means that these predictor variables (instructional planning with ICT, lesson delivery in the classroom with ICT) interacted together relatively and substantively predicted the development of learning competences in pupils.

DISCUSSION

Instructional planning with ICT and the development of learning competences (skills)

The analyses reveal that instructional planning with ICT significantly correlated with learning competences, r (148) = 0.441, ($p < .001$). From this result, it was concluded that instructional planning with ICT significantly correlates learning competences in primary school pupils. This test-value gave a coefficient of determination of 0.194, meaning that 19.4% of the variability of learning competences is explained by instructional planning with ICT. These findings continue to validate research by Hella (2011) that suggested four steps of technology integration lesson planning for teachers: Examine Curriculum Documents, Determine Knowledge and Skills, select a Technology Product, and Select a Method of Assessment and Criteria for Evaluation.

The results also confirmed NETS-S; ISTE, (2007), reports that emphasises on technology as a tool for research, communication, collaboration, problem solving, and decision making, which are essential skills for teaching and learning and identify six core components which include: Creativity and Innovation, communication and collaboration, research and information fluency, critical thinking, problem solving and decision making, digital citizenship, technology operations and concepts. The study also confirmed that instructional planning with ICT facilitates the acquisition of learning competences by providing cognitive scaffoldings for students as they make sense of the information gathered; allowing experts, teachers and students to communicate their thoughts and interests in subject matters and simulating real-life situations and problems for students as they explore the connections between concepts and ideas(Lim and Hang, 2003, Mann, Shakeshaft, Becker and Kottkamp, 1999; Sivin-Kachala, 1998; Wenglinsky, 1998).

Lesson delivery with ICT and the development of learning competences (skills)

The findings show that lesson delivery with ICT significantly correlated with learning skills in primary schools, r (148) = 0.417, ($p < .001$). From this result, it was concluded that lesson delivery with ICT in the classroom significantly correlates the development of learning competences in primary school pupils. This test-value gave a coefficient of determination of 0.174, meaning that 17.4% of the variability of learning competences is explained by lesson delivery in the classroom. This validates Fisher (2000), viewpoint that word processors, spread sheets, statistical packages, databases, simulation, teleconferencing, C.D. ROMS and internet can make History lessons alive and more interesting in the classroom. Computers offer the greatest potentials for meaningful technological usage in History lessons (Fisher 2000).

This also confirmed Amengor (2011) who states that Hypermedia or multimedia presentation software, electronic encyclopaedia or atlas and simulation programmes are also important technologies for teaching History. Power point presentation for instance can be used to link text, sound, movies and pictures to make historical events vivid. When combined, these technological tools with effective practical computers skills can add a new dimension to teaching in the classroom (Fisher 2000).

Assessment using ICT and the development of learning competences (skills)

The analyses reveal that assessment with ICT significantly correlated with learning competences, r (148) = 0.370, ($p < .001$). This test-value gave a coefficient of determination of 0.137, meaning that 13.70% of the variability of pupils' learning competences is explained by assessment with ICT. This confirmed The Framework for 21st Century Learning emphasizing information literacy, media literacy, and information, communications, and technology (ICT) literacy. Specifically, information literacy requires the ability to efficiently access, critically evaluate information and creatively use it to solve problems. It also continues to validate Bebell, Russell and O ''Dwyer (2004), who identify seven dimensions of ICT use in the classroom which are classroom preparation, professional e-mail use, delivering instructions, accommodation, student use, student product, and grading. Teachers can use digital video cameras to create examples for pupils' work; video their performance and analyse for improvement in music and language classes, record and discuss pupils' work and analyse for improvement using Digital Cameras and tape pupils' performances for student/peer evaluation using Cassette recorders, CD players. From a multiple hierarchical regression analysis, the parameters of the model for the development of learning competences were considered. In the first model, R^2=0.194 which implies that the predictor variable (instructional planning with ICT) accounted for 19.40% of the variability of learning competences in pupils and the second model was a better one because, ΔR^2 =0.079 which implied that when added, the predictor variable (lesson delivery using ICT) accounted for 7.90% of the variability of the development of learning competences. Information and Communication Technology (ICT) is important in primary education because it enables kids to search for the information they need and to organize what they have found. As children progress through the school system, they become increasingly responsible for their own learning. ICT is a global phenomenon, and children who are computer literate at an early stage of their lives might deal better with the modern world. A sound knowledge of ICT makes it much easier for children to find and organize information. The use of ICT is affected by many things such as social, cultural, political, economic and educational changes. Hernes (2003), believes that computers were being an important family and workplace technologies due to an increasing reliance on them. The methods in which hardware has been produced and worked are expressions of globalisation and there is now widespread global recognition of brand names such as Microsoft, Apple, Panasonic, Sony, Intel and Nokia.

There are three stages for ICT to be highly valued and regarded by teachers in the classroom. These include integration, enhancement and complementary. Integration concerns implementing the right use of ICT subject areas that involve complex concepts, achievement and performance. Enhancement involves using ICT to give great emphases on the topic or lesson introduced while complementary is when the ICT is used to help and support student learning (Herman, Tondeur, Van-Braak, &Valcke, 2008). Herman et. al (2008) identify five levels of technology use in education: presentation, demonstration, drill and practice, interaction, and collaboration. According to them, each of the different ICTs-print, audio/video cassettes, radio and TV broadcasts,

computers or the Internet-may be used for presentation and demonstration. Apart from video technologies, drill and practice may likewise be performed using the whole range of technologies. On the other hand, networked computers and the Internet are the ICTs that enable interactive and collaborative learning best; their full potential as educational tools will remain unrealized if they are used merely for presentation or demonstration (Herman, Tondeur, Van-Braak, &Valcke, 2008). According to Sofowarav&Egbedokun (2010), there are different kinds of technological resources that are useful for the teaching of History and Geography which involve internet, interactive digital television, video, web based-instruction, computers and video conferencing. To Fisher (2000), word processors, spread sheets, statistical packages, databases, simulation teleconferencing, C.D. ROMS and internet can make a History lesson alive and more interesting in the classroom. Computers offer the greatest potentials for meaningful technological usage in History lessons (Grabe& Fisher, 2000). Fisher (2000), believes that the internet is incomparable tool and resources for teaching when used with discretion. Hypermedia or multimedia presentation software electronic, encyclopaedia or atlas and simulation programme are also important technologies for teaching History (Amengor, 2011).

CONCLUSION

Introducing a new technology in any learning situation requires a great deal of thought, planning and a good deal of developmental testing. The various pedagogical perspectives or learning theories are very important in designing and interacting with educational technology. These theoretical perspectives are behaviorism, constructivism and cognitivism. Educators and researchers must have a good grasp of technology and it advantages, and how it can be integrated in the teaching and learning process. Teachers' continual professional development in ICT should also be taken into consideration when drafting ICT policy. Curriculum designers need to consider the level of staff knowledge/expertise in relation to ICT., Primary school curriculum designers should also consider the "ICT in Education Toolkit', (Information for Development Program) as proposed by UNESCO (2012), which recommends that policies for primary schools should be organised around the need to formulate and assess ICT-Enhanced programs; plan for Physical and Human Requirements; plan for ICT-Enhanced Content; generate Programme Costs; create a Master Plan and Monitor Implementation, Effectiveness, and Impact. To use ICT for daily classroom activities of teaching and learning, it is important for the teacher to prepare lesson plans and compile lesson materials. For this to be done effectively, he must go through the act of drafting phase, editing phase, revising phase and finally publishing the lesson plans and course contents. Teachers can also use interactive multimedia-based instructional materials where learners are given control to review the topic at their own pace and in accordance to their individual interests, needs and cognitive processes. Multimedia courseware can help the teachers to meet the challenges of such situation. Primary schools should be equipped with ICT facilities such as Computer, internet, mobile phone, DVCs and CDs, audiotapes, campus radios, videotapes and television as these facilities can be used by teachers and pupils to exploit ICT in their teaching and learning. Primary schools should be provided with technical assistants and coordinators to maintain ICT systems and ensure that the infrastructure remains compatible with developments in software. The planning, allocating resources and budget, as well as giving technical and curriculum support, such as coordinators also help in the effectiveness of teachers in the integration of ICT-based teaching.

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