

Factors Affecting Teachers' ICT Use for Instructional Purposes: The Case of South Gondar Administrative Zone, Amhara, Ethiopia

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Abstract

The purpose of this study was to explore the factors affecting teachers' ICT use for instructional purposes in secondary schools of South Gondar Zone, Ethiopia. To achieve this purpose, it identified the factors that hamper teachers not to integrate ICT in their teaching, learning, and researches. It also looked into the relationships between teachers' ICT use and the identified factors; and examined the extent to which teachers' ICT use is affected by the identified factors. In doing so, descriptive survey design was employed. Simple random sampling technique was used to decide on the woredas. In this case, from 11 woredas, five woredas were selected. Furthermore, 5 preparatory schools were taken using comprehensive sampling technique; moreover, 5 high schools were taken using lottery method. From these schools all 303 teachers were taken. In addition, 10 principals, 5 supervisors, and 4 district education office heads were taken purposively. Questionnaire, focus group discussion, and interview were used to collect data pertinent to the research topic. To analyze the quantitative data, therefore, Pearson product moment correlation and multiple regression analysis were employed. Furthermore, narration, direct quotation, and story-telling techniques were used to analyze the qualitative data. The finding of the study revealed that there were statistically significant relationships observed between teachers' ICT use for instructional purposes and teacher's perception ($r=0.51$); ICT use and teacher training ($r=0.26$); ICT use and school policy ($r=0.56$); ICT use and access to different ICTs ($r=0.70$); ICT use and school support ($r=0.41$); and ICT use and school curriculum ($r=0.51$). These factors jointly contributed about 64.3% of the variance of the teachers ICT use for instructional purposes. Among the above factors, teachers' perception and access to ICT facilities and materials predict significantly teachers' ICT use for instructional purpose. Based on the findings possible recommendations were also forwarded.

Keywords: Information communication technology, ICT use for instructional purposes, ICT for quality education

1. Introduction

1.1. Background of the Study

Information and communication technology (ICT) is a force that has changed many aspects of the way we live. If one was to compare such fields as medicine, tourism, travel business, law, banking, engineering and architecture, the impact of ICT across the past two or three decades has been enormous. The way these fields operate today is vastly different from the ways they operated in the past. But when one looks at education, there seems to have been an uncanny lack of influence and far less change than other fields have experienced (Collis, 2002).

Similarly, Information and communication technologies (ICTs) - which include radio and television, as well as newer digital technologies such as computers and the Internet etc.-have been touted as potentially powerful enabling tools for educational change and reform. When used appropriately, different ICTs are said to help expand access to education, strengthen the relevance of education to the increasingly digital workplace, and raise educational quality by, among others, helping make teaching and learning into an engaging, active process connected to real life. Technologies allow students to work more productively than in the past, but the teacher's role in technology rich classrooms is more demanding than ever (Keengwe, Onchwari et al. 2008).

Consequently, ICT has affected teaching, learning and research (Yusuf, 2005), with the potential to improve the quality of education. What then, are the potential benefits of ICTs to education, particularly at secondary school level? In group research projects for instance, pupils can have an online collaborative platform where they can share information and ideas and work on the project simultaneously across space and time. This has added advantage of creating teamwork skills in the pupils which will be useful in their post high school lives. Secondly ICTs have the potential to increase learner independence and ensure pupils' active participation in school (Newhouse, 2002). This is possible where pupils can have access to learning material independent of the teacher and can have self-paced lessons not restricted by space or time. In addition, a student can have access to electronic learning resources like Encarta encyclopedia, and other scholarly articles available electronically that have the potential to increase knowledge and add value to the pupils learning process.

Teachers can also benefit from the use of ICTs in education through integrating different ICTs into the various teaching activities. They can easily prepare, modify and distribute course material to pupils through email or Content Management Systems that allow one to place documents in a pre-defined area so that pupils can access such information. Further, teachers can use multi-media such as projectors, audio-video and so on to present their lessons in different ways and have students make presentations using different multi-media. At this point, it is crystal clear that teachers play a key role in using ICT effectively in the teaching and learning process which brings about education quality.

In addition, students can benefit from ICT in schools. As Brush, Glaze ski and Hew (2008) have stated, ICT is used as a tool for students to discover learning topics, solve problems, and provide solutions to the problems in the learning process. ICT makes knowledge acquisition more accessible, and concepts in learning areas are understood while engaging students in the application of ICT.

Generally, for developing countries like Ethiopia, ICT can moreover be seen as a way to merge into a globalizing world. However, studies showed that teachers don't benefit from ICT in activities they developed in the classroom environment, and their ICT usage often remains on a personal level. They cannot transfer their ICT usage from personal purposes to professional life, especially to instructional purposes (Newhouse, 2002)

In Ethiopia, there are few researches done on the area of ICT use and integration; but they focused on, for example, Using "plasma TV" broadcasts in Ethiopian secondary schools (Getnet,2008); access to Online Information and Knowledge (Chekol, 2009) and the like. Hence, research into the ICT barriers in Ethiopia seems so scarce; the researchers have faced difficulty in finding articles addressing factors affecting ICT utilization in the country. The purpose of this study was, therefore, to explore the factors affecting teachers' classroom ICT use in secondary schools of South Gondar Zone.

1.2. Statement of the Problem

Though there have been many significant developments in ICT-based teaching techniques and materials, some studies show that in both developed and developing countries, serious difficulties are being experienced during the integration of ICT-based techniques and approaches in education.

As noted in the World Education Report (UNESCO, 2005), education worldwide is facing a significant challenge in preparing students and teachers for "our future 'knowledge-based' society" during a time when most teachers are not prepared to use ICT and "the majority of existing school buildings, even in the most developed countries, are not equipped to integrate the new information and communication technologies."

Teo et al. (2008) investigated a quantitative study examining the possible relationship between Singaporean teachers' beliefs about teaching and technology use. The outcome of the study implies that even though technology can foster interactive, self-directed learning and higher order thinking, technology integration is not effectively used to improve quality teaching and learning.

In addition, in the US, a survey by UNESCO (2005) showed that only half of the teachers who had access to computers used them in their lessons. Likewise, about half of British secondary schools reported 'substantial use' and half reported 'little use'.

According to UNESCO (2005), again, only 35% of already trained teachers in secondary schools in Europe, Asia and Africa, have basic skills in ICT, which leaves the remaining 65% of the teaching work force on the three continents still in need of computer skills. Thus, national governments are globally realizing the need to fill the gap in the teaching force and are seeking new strategies and programs to enhance the integration of ICT in education.

Similarly, Berhane (2012) pointed out that in many African Countries, particularly in East Africa, most teachers do not integrate ICT into their instruction as it should be, because of several interrelated factors, such as manipulative, non-manipulative and teacher factors. Manipulative factors include beliefs, skills and commitment of teachers, ICT knowledge, availability of ICT resources, whereas non manipulative factors include age, gender, religion, educational experience, computer experience, national policy and external supports. This implies that ICT integration is not dependent on one factor, but to several interrelated factors that directly or indirectly affects the use of ICT into classroom instructions.

Ethiopia has currently embarked upon the use of ICT in a bid to raise the quality of education of secondary schools. At this level, the effort is not merely an inclusion of a media dimension to the teaching-learning process, but also to overcome the pressing problem of the supply of qualified teachers. The Growth and Transformation Plan of the country identifies Information and Communication Technology development as an essential component in achieving the objectives in all sectors. The Government has approved, in principle, the national ICT for development policy as a framework for facilitating Ethiopia's ICT-led socio-economic development program, targeting the development of information and a knowledge-based society and economy (FDRE, 2009).

Even though ICT has become an integral part of Ethiopia's development programs over the last decade, the country faces a substantial gap between interest in the ICTs and the implementation of the policy (Adam, 2010). Furthermore, Jaway (2003) observed that in Uganda and Ethiopia, the education system is still heavily relying on

traditional systems and severely lagging behind as far as new technologies are concerned; as a result, students' academic achievement is greatly affected. This scholar, moreover, asserted that students who are taught by ICT users tend to have better achievement.

Therefore, this paper was designed to assess factors affecting teachers' classroom ICT use on in secondary schools of south Gondar zone, Ethiopia, there by recommended solutions for appropriate intervention for stakeholders. In view of this, the present research tried to answer the following basic research questions.

1. What are the factors affecting teachers' classroom ICT use (ICT use for instructional purposes)?
2. What are the relationships between teachers' Ict use and the identified factors?
3. To what extent is teachers Ict use affected by the identified variables?

1.3. Objective of the study

The current study generally aimed to explore the factors affecting teachers' classroom ICT use in secondary schools. Thus the study specifically aimed to:

- Identify the factors that affect teachers Ict use for instructional purposes
- Identify the relationships among the factors affecting teachers' use for instructional purpose.
- Examine the extent to which teachers' Ict use is affected by different variables.

2. Materials and Methods

2.1. Study Design

The purpose of this study was to explore the factors affecting teachers' classroom ICT use in promoting quality education in secondary schools of South Gondar Zone, and to do so descriptive survey method was employed. Thus, the methodological approach used was mixed design, both qualitative and quantitative. This design is supported by Dornyei, (2007) as cited in Addisu et.al (2011), as an appropriate methodological approach for the problem under investigation.

2.2. Study Participants

In the zone, there are 11 woredas, and from these, 5 woredas namely Tach Gaynt, Simada Ebinat Debre Tabor and Addis Zemen were taken using simple random sampling technique. Furthermore, secondary and preparatory schools from woredas were taken using lottery method because there is homogeneity among the population considered in the study. Hence, from each woreda, 1 secondary school was chosen using lottery methods, and preparatory school was purposefully chosen because in most woredas there is only one preparatory school. Totally, 10 schools were taken as representative sample of secondary schools (high school and preparatory school) which are found in the zone. In addition, the target populations for the study were all teachers, supervisors, school directors or principals, unit leaders and heads of Wereda education bureau of secondary schools (high school and preparatory school); they were considered as study participants. Teachers' were selected using simple random sampling technique. Using this method a total of 303 teachers was selected. However, the participants other than the teachers were selected purposively, for they are part of the schools management structure.

2.3. Data Gathering Tools and procedures

2.3.1. Data gathering tools

The pertinent data required from the respondents was collected through the following data gathering instruments.

- **Semi- structured interview:** this technique was preferred because of its promising advantage to gather raw data from the participants. It can be helpful again to clarify ideas, as the interviewer will have the chance to ask for clarification. It was developed to each sample school directors, supervisors, unit leaders and woreda educational head officers to obtain data about the implementation of ICT and its barriers which hamper teachers to use ICT for instructional purposes.
- **Focus group discussion:** this tool was used to obtain relevant data about the study, as it can help the participants to identify ICT barriers, sharing their experiences and spotting problems they face regarding ICT in the teaching learning process. Therefore, in each school, those who are part of the school's management structure such as school principals, department heads, unit leaders, supervisors, and some teachers (3 teachers from each stream) were selected to conduct focus group discussion. To do so, from the 10 schools, there were 20 focus group discussions. To undertake this research, the participants were cleared with the procedures of focus group discussion, and in this case, the moderators were in touch with researchers to minimize the problems they may face during the discussion.
- **Questionnaire:** the reasons why a questionnaire was developed here in this study is that it is pertinent data gathering instrument from many participants so that valid data were gathered. Hence, it is to be distributed to teachers to obtain data about the factors that are affecting the integration of ICT in the teaching learning process.

2.3.2. Data gathering procedures

Pilot study

The researchers came to agreement to prepare questions to test the data gathering tools by teachers in some selected schools. Thus, after the questionnaire were typed and made ready, the pilot study was conducted in Debre Tabor secondary school, and Dagmawi Tewodros General Secondary school. Following the administration of the pilot study, the analysis was made to select appropriate questions that suit the desired objectives of the study and also to determine the reliability of the items and found to be 0.89. At the end, taking the necessary feedbacks, the final questionnaires were made ready for the study.

Main study data gathering process

After questions were testified by the researchers, the main task was to disseminate the data questions that are prepared in the specified data gathering instruments. Firstly, interview was conducted with educational bureau officers, school principals, and supervisors. In doing so, those participants were clear with the purpose of the study before the actual interview delivery. Secondly, data were collected through focus group discussion from selected teachers and concerned participants participated in the interview. Last, questionnaire was distributed to teachers just to see significant relationships and to validate the responses obtained through interview and focus group discussion. To do this, respondents were clear with its purpose and how to fill it as well.

2.4. Data analysis methods

The data analysis included the content analysis of responses to the questionnaires, interviews, focus group discussion. The collected raw data was tailed, organized and tabulated according to the similarities of the issues raised in the questionnaires. In addition, the collected information through interview and focus group was presented to complete the data obtained by means of questionnaires. Tools of data analysis used to analyze the data obtained through quantitative and qualitative instruments were as follows:

2.4.1. Quantitative data

The study were employed both descriptive and inferential statistics to analyze the data collected through questionnaire. The following tools of data analysis were used. Computer software called statistical package for social science (SPSS) were used for analysis after the response of questionnaire and classroom observation.

- ✚ Correlation coefficient was conducted to see the interrelationships among the variables considered in the study.
- ✚ Stepwise regression analysis was used to identify the factors affecting teachers' classroom ICT use and to examine the extent to which the factors affect teachers' classroom ICT use.

2.4.2. Qualitative data

Data collected using interview and focus group discussion will be analyzed through direct quotation, interpretation, storytelling and narration.

3. Results and Discussion

3.1. Results of the study

Table 1: interrelationships among the contributing factors (N= 303)

N	Variables	Mean	Sd	Correlations									
				1	2	3	4	5	6	7	8	9	
1	Teachers ICT use	3.079	.596	1									
2	Language command	2.617	1.349	0.05	1								
3	Teachers' perception	.941	1.047	0.51*	-0.08	1							
4	Teachers' Attitude	3.439	.594	0.11	-0.05	0.04	1						
5	Teachers' Training	3.072	.745	0.26*	0.03	0.04	0.02	1					
6	School policy	5.496	.367	0.56*	0.50*	0.04	0.54*	0.41*	1				
7	Access to ICT	4.847	.372	0.70*	0.04	0.06	0.70*	0.47*	0.62*	1			
8	Curriculum	3.252	.432	0.51*	0.06	0.05	0.70*	0.44*	0.67*	0.83*	1		
9	Support	3.637	.412	0.41*	0.11	0.06	0.40*	0.58*	0.81*	0.79*	0.85*	1	

*Correlation is significant at 0.05 levels two tailed.

As indicated in the table 1 above, there were statistically significant relationships observed between teachers' Ict use for instruction purpose and teacher's perception ($r= 0.51$); teacher training ($r= 0.26$); school policy regarding teachers' Ict use ($r= 0.56$); access to Ict ($r= 0.70$); school curriculum ($r= 0.51$) and school

support to the teachers to use Ict for instruction purpose ($r = 0.41$), but no significant relationships were observed between teachers Ict use and other variables considered in the study such as age, language instruction of the teacher's and attitudes of the teacher's ($p > 0.05$). Sex of the teachers was significantly related with school policy regarding teachers' Ict use ($r = 0.50$), but sex of the teachers do not have significant relationships with the rest of the variables (language proficiency of the teachers', teacher's perception, teacher's attitude teacher's training, access to Ict, curriculum of the school and support provided to the teachers' to use Ict for their instruction)

Similarly, none of the variables were related significantly with language proficiency of teachers. Teachers' perception regarding using Ict for instruction purpose significantly related with school policy ($r = 0.54$), access to Ict ($r = 0.70$), school curriculum ($r = 0.70$) and support given to teachers to use Ict for instruction and teachers perception were not related significantly related with teacher's attitude and training provided to the teachers' ($p > 0.05$). Furthermore, teachers' attitude regarding Ict use for instruction purpose significantly related with teachers' training ($p = 0.56$), school policy regarding teachers' Ict use ($r = 0.41$), access to Ict ($r = 0.47$), school curriculum ($r = 0.44$) and school support for teachers' to use Ict for instruction purpose ($p = 0.58$).

Statistically significant relationships were found between teacher training and school policy ($r = 0.56$), access to Ict ($r = 0.62$), school curriculum ($r = 0.67$), and school support ($r = 0.81$). School policy also significantly related with school curriculum ($r = 0.83$) and school support ($r = 0.79$). Moreover, access to Ict were significantly correlated with school support ($r = 0.85$).

The strongest and modest correlation were found between teachers Ict use for improving quality of education and teachers' access to ict facilities and materials, teachers access to Ict facilities and material and teachers' perception and school curriculum and teachers' perception. The strongest and highest magnitude of correlation were found between school support for teachers to use Ict for their instruction and teacher's training, school policy regarding Ict use and access to Ict facilities and materials, school curriculum, and school support for the teachers to use Ict to improve their instruction.

Table 2: Summary of results of multiple regression analysis on selected predictor variables

Model	Un-stand. coefficient	Stand. Coefficient	T	p-value	R	R ²	Adjusted R ²	Std. err
Constant	4.52		9.31	0.000	0.806	0.649	0.643	0.35626
Teachers' Perception	0.168	0.296	4.73	0.000				
Teachers' training	0.140	0.175	2.46	0.014				
Access to Ict	2.823	1.764	15.15	0.000				
School policy	0.373	0.230	3.01	0.003				
School support	0.947	0.654	7.34	0.000				
School curriculum	0.213	0.152	2.65	0.005				

The above table shows that the independent variables (teachers perception of Ict use for instruction purpose, the training received by the teacher regarding Ict, access to Ict resource and material, school policy regarding Ict use and support provided by the schools to use Ict for instruction purpose); when pulled together have a significant effect on the teachers Ict use for instruction purpose to improve the quality of education. The value of R (adjusted) = 0.806 and R² (adjusted) = 0.643. This implies that 64.3% of teachers Ict use for instruction purpose accounted by a linear combination of the predictor variable.

As can be seen in the summary of multiple regression analysis, there was a statistically significant relation found between teachers' perception about the Ict use for instruction purpose ($t = 4.37$, $p < 0.000$), training received by the teachers' ($t = 2.46$, $p < 0.014$), access to Ict facilities and resources ($t = 15.15$, $p < 0.000$), school policy to use Ict to instruction purpose ($t = 3.01$, $p < 0.03$) and support provided to teachers to use Ict ($t = 7.34$, $p < 0.000$).

Table 3: Summery ANOVA table

Model	Sum of squares	Df	Mean squares	F	Significance
Regression	69.705	5	13.941	109.841*	0.000
Residual	37.695	297	0.127		
Total	107.400	302			

*Significant at $P < 0.001$

As indicated above in the table above result further strengthened by the F-value (109.841) which is significant at df (5, 297) at significance level of $p < 0.001$.

Table 4: Summary of stepwise regression analysis

Variables	R	R2	Change in R ²	Beta value	F-value	t-test	p-value
Perception	0.504	0.254	0.254	0.244	102.28	10.11*	0.000
Training	0.559	0.313	0.059	0.405	25.95	5.09*	0.000
Policy	0.609	0.370	0.057	0.657	27.18	5.21*	0.000
Access	0.765	0.585	0.215	0.310	154.47	12.43*	0.000
Curriculum	0.805	0.648	0.062	0.257	52.55	7.25*	0.000

* is significant at P<0.001

The result of stepwise regression shows only one factor made a significant contribution to the prediction of teachers Ict use for instruction purpose in terms of magnitude. Thus, in terms of magnitude of contribution, teachers' perception of Ict use for instruction purpose made the most significant contribution. The relative contribution of teachers' perception regarding Ict use for instruction purpose is 25.4%, followed by access to Ict facilities and material 21.5%, school curriculum 6.2%, training received by the teachers' to utilize Ict in their instruction 5.9%, and school policy to utilize Ict for instruction purpose 5.7%. The contribution made by school support for the instructors to use Ict in the teaching learning process is found insignificant.

4.2. Discussion

Although the Government of Ethiopia is committed to implementing ICT in education, the result of this study showed that the process is hindered by a number of barriers. The factors are categorized as per findings of the study supported by literature.

Teachers' perceptions and Beliefs about ICT

There exists a strong and positive relationship (0.51) between teacher's perception and teacher Ict use for instructional purpose. This finding is inconsistent with the finding of Buabeng-Andoh (2012), stating that the correlation between perception and ICT use was positive and low but not statistically significant ($r = .09$, $p > .01$). Furthermore, teachers' perceptions regarding Ict use for instructional purpose have been found to be a major predictor. This result consistent with the result obtained from interview and focus group discussion. Some of the participants (22%) replied that they believe that Ict if it is used for instruction purpose it raid out the culture of the community and replace by cheap western cultures. They said its negative impacts outweighs.

A teacher from s1 stated:

In the first place, I do not like to use technology because I feel that it has negative impacts on the pupil. Let me say something about internet. If you motivate students to use internet, it reduces their effort to be problem solvers because they can easily get the solutions by browsing appropriate materials. Furthermore, students engage in adoption of cheap western culture.

In addition, a teacher from s2 responded:

There are some ICT facilities in my school, but I am not interested to use for instructional purposes. It makes me feel better when use, for example, blackboard than projector. I do not know whether students like this or not, but I cannot see the good sides of ICT. It rather makes people depend on technology than working on things by themselves and it also bring negative Cultural Revolution.

Hence, one can say that teachers' beliefs on ICT affect its use for instructional purposes. These ideas are supported by Mumtaz (2000) who claims that teachers' beliefs about teaching and learning with ICT are central to integration. To be successful in computer use and integration, teachers need to engage in conceptual change regarding their beliefs about the nature of learning, the role of the student, and their role as teacher. Hence the successful use of ICT into classroom largely depends on teachers' attitudes and belief relating to these. Moreover, it has been suggested that attitudes towards computers affect teachers' use of computers in the classroom and the likelihood of their benefiting from training (Kluever, et al, 1994). From the above discussion one can conclude that teacher's perception and belief significantly affect teachers' Ict use for instructional purpose.

Lack of in-service training as a means to support ICT skills

In service training contributed was positively related with teachers' Ict use for instructional purpose, furthermore the in-service contributed (5.9%) to the teachers Ict use for instructional purpose. Regarding to the contribution made in service training was one of the contributors from the considered variables in this study. Similarly, almost all of the respondents of the study (98%) stated that they lack necessary and appropriate trainings to support their ICT skills

A teacher stated:

ICT skills are necessary for educational purposes. In my school, there are few ICT equipments, but I do not know how to use a computer, how to use internet, even how to store instructional files using CDs and other storage materials. My colleagues who teach computer studies are not willing to give us appropriate trainings. They always complain for their work load and say that they suffer from

their business in teaching their subjects.

This finding is consistent with finding obtained from the quantitative data. 31.3% of the variance of teachers' Ict use for instruction purpose predicted by training provided to the teachers. Supporting the finding of the study Mumtaz (2000) in his study reported that in-service training is one of the (few) ways in which teachers typically have been given support to achieve ICT skills to facilitate their classroom teaching, and it has been successful in a way: teachers, like other people, use ICT in their activities outside school. To ensure efficient ICT integration and use for instructional purpose teachers must be provided with sufficient on-going training (Vannatta & Fordham, 2004). Similarly Mueller, Wood, Willoughby, Ross, and Specht (2008) stated that teachers Ict use for instructional purpose highly depends on professional development. Similarly, teacher's in-service Ict training does have its hand in affecting teachers Ict use for instructional purpose.

Government Policy

The Educational policy of Ethiopia has emphasized the implementation of ICT in education in order to improve the quality of the educational system and also to create an improved teaching and learning environment to empower and develop the proficiency of teachers and students in the country. However, in the study, some participants reported that the use of ict in education is on paper only as vision and cannot be realized on ground. They claimed that effective implementation of ICT in education is not merely a vision. Rather, it needs a proper plan, policies, execution and monitoring: which is really a major constraint for a country like Ethiopia.

A teacher T1 reflected:

I think the educational policy of the country introduced the importance and use of ict at all levels for innovation. This is a good start for developing countries like Ethiopia where limited innovation is found. But, according to my observation, the policy remains on paper, and it is not translated into practice.

This result highly correlated with the result obtained from document analysis, and focus group discussion. As Omwenga E.I., Waema T. M., and Eisendrath G.E. (2002), Policy and planning are important in identifying the aims of using ICT in education and in determining priorities in allocating resources furthermore, education authorities and the centers for which they are responsible have key tasks related to enabling, implementing and monitoring the use of ICT for learning and teaching. Countries rated low on appreciation of ICT have ICT policies that merely recognize the strategic role of ICT for growth and development (Guma, Haolader and Muhammad, 2013). Furthermore, Fisseha (2011) stated that Policies must take into account the retraining of teachers incorporating use of ICTs in education. Teachers should skillfully redesign learning environments so that students can transfer their newly gained ICT skills to other applications to use in an ICT rich environment. Government policy significantly correlated ($r= 0.56, p < 0.001$), with teacher's Ict use for instructional purpose, as a result teachers. Hence, government policy affects Ict use for teaching and learning purposes.

Access to ICT facilities and resources

As indicted in the Table 1 above there was significant relationships were found between access to Ict facilities and resources and teacher's Ict use for instructional purpose. Moreover, access to Ict facilities and material predicted 21.5% of the variance of teacher's Ict use for instructional purpose. Data from focus group discussion revealed that the majority of the respondents (84%) reported that secondary schools in South Gondar zone lack the necessary resources and appropriate infrastructure and resource for implementing ICT in education.

Similar results also found in Mumtaz (2000) study that the effective use of ICT would require the availability of equipment, supplies of computers and their proper maintenance including other accessories. Access to ICT infrastructure and resources in schools is a necessary condition to the integration of ICT in education. In supporting the above idea, Plomp, Anderson, Law, & Quale, (2009), stated that effective adoption and integration of ICT into teaching in schools depends mainly on the availability and accessibility of ICT resources such as hardware, software, etc. Obviously, if teachers cannot access ICT resources, then they will not use them. Therefore, access to computers, updated software and hardware are key elements to successful Adoption and integration of technology. Thus, from the above finding one can deduce that teachers' access to Ict and technological resources are one of the major factor that hinder their utilization in the instructional process.

On the other hand, focus group discussant and teachers interviewed revealed that access to Ict facilities and material also affected by the funds allocated to the schools. In line with this, majority of school principals and teachers in the study (91%) stated that the government emphasizes the use of ICT in schools for teaching and learning process. However, it seems that the schools should budget their ict facilities which require huge amount of money. They added that if the government wants students and teachers to be innovative in terms of ICT, it should plan to support schools with appropriate funding.

For example, a principal reported that:

Nowadays, the world is becoming a small village. This is due to technology; and it makes human lives simple. But, the thing is if this does not change the country in a positive way, it won't work out. In my opinion, schools are the major changing agents of a country, and if the government emphasizes the use of ict in school environments for instructional purpose, it

should fund schools with appropriate plans and monitoring strategies though it requires huge budgets.

This idea is supported by Mumtaz (2000), who reported that effective implementation of technology into education systems involves substantial funding, that is very hard to manage. ICT-supported hardware, software, internet, audio visual aids, teaching aids and other accessories demand huge funds. He added that many scholars proposed that the lack of funds to obtain the necessary hardware and software is one of the reasons teachers do not use technology in their classes.

Curriculum

The result in Table 1 showed that there exists a statistically significant relationship between school curriculum and teachers Ict use. This finding is consistent with the finding obtained from interview, focus group discussion and document analysis, they stated that school curriculum should have contents, topics, objectives and exercise if it is included teachers are forced to look for and use Ict for instructional purpose, but none of the school curriculum except information subject does have contents and exercise related to Ict. According to Buabeng-Andoh, (2012) restrictive curricula is one of the major factors which significantly affect teachers Ict use for instructional process. From the above discussion one can conclude that school curriculum is one of the factors that affect teachers Ict use for instructional purpose. Support provided by the school also significantly related with teachers Ict use. This finding also consistent with the finding obtained from the focus group discussion and interview. Moreover, school support to the teachers regarding Ict use contributed significantly to the variance of the Ict use by the teachers.

Surprisingly, the result showed that statistically significant relationships were not found between attitudes of the teachers regarding Ict use. This finding is consistent with the finding obtained by Bingimals, (2009) stating that teachers has a strong desire to integrate Ict in their instruction. Furthermore, the result also consistent with the result obtained from focus group discussion. There is no statistically significant relationship were obtained between teacher's language command and their Ict use. From the above finding one can easily conclude that attitude and language of the teachers are not the factor that affected teachers Ict use for instructional purpose.

4. Conclusions and Recommendations

4.1. Conclusions

Few studies examined the factors affecting teachers Ict use for instructional purpose. However, they were not done in Ethiopian context where there said to have a lot of factors responsible for ICT use in education. This study, therefore, was conducted to identify the factors affecting teachers Ict use for instruction purpose.

- The finding of this study showed that there are significant relationships among teacher's perception, teachers' training, school policy, access to ict facilities and materials, school curriculum, school support and teachers' Ict use for instructional purpose. The study depicted that, these factors highly affected the teachers' Ict use for instructional purpose.
- From above discussion one can conclude that access to ict facilities and materials and teachers perceptions are highly influenced teachers' ict use for instruction purpose.
- School curriculum is also other prominent factor in influencing teachers' Ict use for instructional purpose. In addition to this school policy, and school support also found significantly affecting the teachers Ict Use for instructional purpose.

4.2. Recommendations

Although there is great opportunity for improvement in school education at many levels through the use of ICTs in the country in general, the road to achieving it is not easy. It will take continued commitment from all stakeholders involved to make any kind of substantial and sustainable change. The following broad- based suggestions may act as a basis for building a long-term roadmap to bringing ICTs to schools, and teachers at large in the South Gondar Zone. A key to succeed in this endeavor is to adopt a comprehensive, end-to-end, systematic approach that can be adjusted to adapt to the specific needs and a changing school environment.

Government and school support

Government cooperation is necessary for ICT programs to have substantial impact and be sustainable. In the attempt to reevaluate the education delivery system and curriculum of schools to include ICT, Governments have to consider the social context in which they are implementing this new phenomenon. The realities of individual countries and the disparities within and across their geographies, including their limitations say, the language barrier, should be considered and the availability of ICT should be made according to the needs and desires of the countries in order to facilitate appropriate learning and local ownership of knowledge.

Creating school based ICT facilities

Schools should work together to try to work on school base ICT facilities which could increase school students' access to ICT-based materials. For example, one ICT centre may be created for every five schools in the village/block, and this centre may be equipped with computers, television, radio, or other technologies. A

timetable may be allocated so that each school has access to the ICT centre for one day of the week. Within each school again, different classes may be allocated different periods for accessing the ICT centre.

Prioritizing and Planning Access to Remote Schools

Special consideration should be given to ICT connectivity and accessibility for educational purposes. Bandwidth and spectrum of radio and television wavelengths should be allocated for education. Planning for connectivity infrastructure and regulations should promote and facilitate educational use of ICT.

Creating partnership with national and international donors

Investing on ICT may require huge amount of money. Apart from the national policy, schools and other stallholders should design projects to establish better ICT facilities in their schools which could have positive impacts for teaching and learning.

Creating Policy alignment

National ICT policies will have the greatest impact if they are aligned with other strategic and operational policies. Economic policy should consider other strategic policies which require the success of other policies. For example, if ICT policy is required to be implemented, policy makers should consider other policies aligned with each other; otherwise, policies may remain unimplemented.

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References

- Adam, L (2010). Ethiopia ICT Sector Performance Review 2009/2010. *Towards Evidence-based ICT Policy and Regulation* Volume Two, Policy Paper 9, 2010. Retrieved from http://www.researchictafrica.net/publications/Policy_Paper_Series_Towards_Evidence_based_ICT_Policy_and_Regulation-Volume_2/Vol%202%20Paper%209%20%20Ethiopia%20ICT%20Sector%20Performance%20Review%202010.pdf
- Addissu Liyew, Abraham Kebede, Ayeahunie Enyew, (2011). Evaluative Research on the Professional Competencies of Diploma Graduate of Debre Markose College of Teacher Education. *Journal of educational research* Volume 1 number 1 Goh tsebah printing press.
- Anderson, R.E. (2002). Guest editorial: International studies of innovative uses of ICT in schools. *Journal of Computer Assisted Learning*. 18(2002):381-386.
- Berhane Aradom (2012) *International Journal for e-Learning Security (IJeLS)*, Volume 2, Issues 3/4. Northeast Normal University.
- Brush, T., Glazewski, K. D. and Hew, K. F.,(2008). Development of an instrument to measure pre-service teachers' technology skills, technology beliefs, and technology barriers. *Computers in the Schools*, vol. 25, pp.112-125.
- Castro Sánchez, J. J. and Alemán, E. C.,(2011). Teachers' opinion survey on the use of ICT tools to support attendance-based teaching. *Journal Computers and Education*, vol. 56, pp.911-915.
- Chekol, A. (2009). Ethiopia- 2009 Access to Online Information and Knowledge. Retrieved from Global Information Society Watch: <http://www.giswatch.org/country-report/20/ethiopia>
- Collis, B. (2002). Information technologies for education and training. In Adelsberger, H., Collis, B, &Pawlowski, J. (Eds.) *Handbook on Technologies for Information and Training*. Berlin: Springer Verlag.
- Duhaney, D. C. (2001). Teacher education: Preparing teachers to integrate technology. *International Journal of Instructional Media*, 28(1), 23–30.
- FDRE (Federal Democratic Republic of Ethiopia) (2009) Information and Communication Technology Policy, Draft, Addis Ababa, Ethiopian ICT Development Agency,
- Gay,L.R and Airasian, p. (2000). Educational Research: Competencies for Analysis and Application (6th edition). New Jersey: Prentice-Hall, Inc
- Getnet Demissie (2008). Using "plasma TV" broadcasts in Ethiopian secondary schools: A brief survey. *Australasian Journal of Educational Technology*. Retrieved from <http://www.ascilite.org.au/ajet/ajet24/bitew.html>
- Ilhmeideh, F. M. (2009). Barriers to the Use of Technology in Jordanian Pre-School Settings. *Technology, Pedagogy and Education*, 18(3), 325-341.
- Jaway, B. (2003) The Possibility of Backing Distance Learning with Information Technology in Ethiopia's Universities.
- Keengwe, J. and Onchwari, G., (2009). Technology and early childhood education: A technology integration

- professional development model for practicing teachers, *Early Childhood Education Journal*, vol. 37.
- Kennewell, S., Parkinson, J & Tanner, H. (2000). Developing the ICT capable school. London:
- Kluever, R. C., Lam T. C., Hoffman, E. R., Green, K. E., & Swearinges, D. L. (1994). The Computer Attitude Scale: Assessing Changes in Teachers' Attitudes Toward Computers. *Journal of Educational Computing Research*, 11 (3), 251-261.
- Koc, M.(2005)., Implications of learning theories for effective technology integration and preservice teacher training: A critical literature review, *Journal of Turkish Science Education*, vol. 2, pp.2-18.
- Lim, C. P. & Chai, C. S. (2004), 'An activity-theoretical approach to research of ICT integration in Singapore schools: Orienting activities and learner autonomy', *Computers & Education* 43(3), 215--236.
- Lowther, D. L., Inan, F. A., Strahl, J. D. and Ross, S. M., (2008). Does technology integration work when key barriers are removed?. *Educational Media International*, vol. 45, pp.195-213.
- McMahon, G., (2009). Critical thinking and ICT integration in a Western Australian secondary school. *Educational Technology and Society*, vol. 12, pp.269-281.
- Morgan T. (1996). Using technology to enhance learning: changing the chunks. *Learning and leading with technology*, 23(5): 49-51.
- Moseley, D. & Higgins, S. (1999) Ways Forward With ICT: effective pedagogy using information and communications technology for literacy and numeracy in primary schools. London: Teacher Training Agency.
- Mumtaz, S. (2000). Factors Affecting Teachers' Use of Information and Communications Technology: A review of the Literature. *Journal of Information Technology for Teacher Education*, 9(3), 319-342.
- Newhouse P (1999). Examining how teachers adjust to the availability of portable computers. *Australian Journal of Educational Technology*, 15(2), 148-166. Retrieved April 28, 2011 from <http://www.ascilite.org.au/ajet/ajet15/newhouse.html>
- Newhouse, P (2002); The Impact of ICT on Learning and Teaching. A literature review by Dr. C. Paul Newhouse for the Western Australian Department of Education. Retrieved from <http://www.det.wa.edu/education/cmis/eval/downloads/pd/impactreview.pdf>
- Oliver, Ron (2002) "The role of ICT in higher education for the 21st century: ICT as a change agent for education", www.karmayog.org/redirect/stred.asp?docId=23717
- Omwenga E.I., Waema T. M., &Eisendrath G.E. (2002) "Modeling an E-learning Infrastructure with a Content Calibrator within a Resource constrained Environment". *Proceedings of the 8th International Conference on Technology Supported Learning and Instruction* (Online-Education Berlin), Nov 27th: East African Educational Publishers Ltd, 2002
- Pelgrum, W.J. (2001). Obstacles to the Integration of ICT in Education: Results from a Worldwide Educational Assessment. *Computers & Education* 37, 163- 178.
- Plomp, T., Anderson, R. E., Law, N., & Quale, (2009), A. "Cross-national information and communication technology: policies and practices in education". Charlotte, N.C.: Information Age Publishing.
- Reid, S., (2002): The integration of ICT into classroom teaching. *Alberta Journal of Educational Research*, vol. 48, pp.30-46. Routedge Falmer.
- Serhan, D., (2009). Preparing preservice teachers for computer technology integration. *International Journal of Instructional Media*, vol. 36, pp.439-447.
- Teo, T., Chai C.S., Hung, D. & Lee, C.B. (2008) Beliefs about teaching and uses of technology among pre-service teachers. *Asia-Pacific Journal of Teacher Education*.
- UNESCO (2003). Building capacity of teacher/facilitators in technology-pedagogy integration for improved teaching.(2003). <http://www.uis.unesco.org/template/pdf/ged/2003/ged2003en.pdf>
- UNESCO (2005): Global Education Digest 2005: Comparing Education Statistics Across the World. Retrieved from <http://www.uis.unesco.org/template/pdf/ged/2005/ged2005en.pdf>
- Yildirim, S. (2007). "Current Utilization of ICT in Turkish Basic Education Schools: A Review of Teacher's ICT Use and Barriers to Integration". *International Journal of Instructional Media*, vol. 34, no.2, pp. 171-86
- Yusuf M.O. "Information and Communication Technology and Education: Analyzing the Nigerian National Policy for Information Technology" *International Education Journal* Edition 6 Volume 3 P317, 2005.