HAWASSA UNIVERSITY INSTITUTE OF TECHNOLOGY

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ICT ADOPTION IN SELECTED SECONDARY SCHOOLS OF SIDAMA REGION FOR ENHANCED TEACHING AND LEARNING PROCESS

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ICT ADOPTION IN SELECTED SECONDARY SCHOOLS OF SIDAMA REGION FOR ENHANCED TEACHING AND LEARNING PROCESS

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Declaration

Declaration I declare that this thesis entitled “ICT Adoption in Selected Secondary Schools of Sidama Region for Enhanced Teaching and Learning Process: in Aletawondo, Gordama and Hula secondary schools”, is a result of my own investigation, except where otherwise stated. I have undertaken the study independently with the guidance and support of my research advisors. Other sources are acknowledged by citations giving explicit references. A list of references is appended. The thesis has not previously been accepted for any degree and is not being concurrently submitted in candidature for any degree in any university in the country. Declared by:

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This Thesis has been submitted for examination with my approval as thesis advisor.

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APPROVAL SHEET

As members of the Examining Board of the final MSc open defense, we certify that we have read and evaluate the thesis prepared by Gemeda Yachiso entitled **ICT adoption in selected secondary schools in Sidama Region for Enhancing teaching and learning process**: and recommended that it can be accepted as fulfilling the thesis required for the degree of masters of Information Technology.

Hawassa University school of Graduate Studies Thesis approval sheet

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Abstract

Information and Communication Technology (ICT) is becoming increasingly important for sustainable development, in our daily lives and in our educational system. Therefore, there is a growing demand on educational institutions to integrate and use ICT for enhancing the teaching and learning process and for the students to acquire the necessary skills in this 21st century. ICT is the process of gathering, creating, processing, and storage of information by using hardware, software, as well as the internet and global system of mobile communication (GSM). Realizing the effect of ICT on the workplace and everyday life, today's educational institutions try to restructure their educational curriculum and classroom facilities, in order to bridge the existing technology gap in teaching and learning especially in developing countries like Ethiopia .There exists problems in the inadequacy of exploiting ICT in secondary schools such as lack of the requisite skills and interest of the most teachers as well as lack of active participation IT skill use of student were the widely observed problems in Ethiopia in general and in selected secondary school of this study. Hence, in order investigate the practical weakness and strength of the teaching learning process of ICT class enforced to develop a model for improving the process of ICT adoption for the teaching and learning process. Specifically, the objective of this study was focused on examining ICT adoption in selected secondary schools in Sidama region. The research design selected for this study is a descriptive analysis approach and the study areas of this research were Aletawondo, Gordama, and hula secondary schools located in Sidama region. The total population of the study was 1120 individuals and the sample size was 287 respondent i.e. 280 students selected using simple random sampling technique and 18 interviewees were selected using purposeful sampling method. Here, in order to collect data from the respondents, 40 questions of the questionnaire for 280 students, and 7 interview questions for 18 interviewees and 5 observation criteria were used. Then the data analysis mechanism was by using SPSS software package, and descriptive analysis. Majority of the responses gathered from the three tools shows that there was lack of knowledge and skill of ICT teachers. In this case, level of effectiveness of ICT adoption use, perceived benefits of using ICT, factors affecting ICT adoption, readiness and interest as well as IT Skills were the independent variables while ICT adoption teaching and learning process was the dependent variable. Five mentioned variables have influenced on the individual intention to use new technology. The result shows that there was highly unsatisfied in their learning and using ICT. The lack of attention to improve ICT adoption in the school and they exists weakness on the position of ICT resources and poor in developing skill students were the major findings.

Key Word*: - ICT Adoption, perceived ease of use, IT skills.*

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Abbreviations and Acronyms

ICT ----------Information Communication Technology

GSM----------Global system of mobile Communication

IBM ----------International Business Machine

PC ----------Personal Computer

SPSS ---------- Statistical Package for Social Sciences

SME ----------Small and Medium Enterprises

IT ----------Information Technology

IS----------Information system

TAM----------Technology Acceptance Model

UTAUT---------- Unified theory of acceptance and use of technology

TRA---------- Theory of Reasoned Action

TPB---------- Theory of Planned Behavior

MOE ----------Ministry of Education

PEOU ……Perceived Ease of used

PU...…….....PerceivedUsefulness

CHAPTER ONE

1. INTRODUCTION

This chapter introduces the research and provides an overview of the research, statement of the problem, research questions, objectives of the research, significant of the study and the scope of the study. Furthermore, it presents limitation of the study, definition of terms and thesis organization.

1.1 Background of the study

Information and Communication Technology (ICT) is becoming increasingly important for sustainable development, in the business, in our educational system and in our daily lives (Quarshie, 2015). Therefore, there is a growing demand on educational institutions to integrate and use ICT for teaching and learning process and teach the skills and knowledge the students need to acquire in this 21st century. According to IMPICT (2012), ICT is the process of gathering, creating, processing, and storage of information by using hardware, software, as well as the internet and global system of mobile communication (GSM). Utor, Z. S. and Agbi, A. (2005) Realizing the effect of ICT on the workplace and everyday life, today's educational institutions try to restructure their educational curriculum and classroom facilities, in order to bridge the existing technology gap in teaching and learning. The rearrangement process requires effective adoption of technologies into existing environment in order to provide students with knowledge of specific subject areas and promote expressive learning to enhance the teaching and learning process.

Technologies mainly ICT have brought remarkable changes in the twenty- first century, as well as affected the demands of modern societies. Many governments initiate to improve teaching and learning in schools through ICT. Despite the investments on ICT infrastructure, equipment and professional development to improve education in many countries, (Technology 2014) claimed that huge educational investment have produced little evidence of ICT adoption and use in teaching and learning taking Turkey as a case. Evidence suggests that education sector is investing heavily on ICT but ICT adoption in education sector lagged behind the business sector (Leidner, D.E., & Jarvenpaa, S. L. 1995). Several surveys are carried out to investigate the factors that are related to the utilization of computer technology in teaching and learning processes by different researchers.

During the previous years a huge number of reports have been published on world initiatives to improve quality of education. Among those initiatives there is an increased government and non-government organizations investment to maintain adopting information and communication technology (ICT) in teaching, learning, and administration at public and private schools through ICT integration into existing pedagogies. It is expected to transform teaching and learning processes in schools. Improving education quality in various countries has common long-term objectives including strengthening world competitive, economic development, environmental conditions, and human resource development index. Several statistical analysis have shown that enhancing Education Index affect significantly ICT Development which in turns increased Human Development Index. Most of the people in the world practice ICT utilization in the activity of daily life. Using technology is conducted to make the work completion more efficient and the result is better. ICT is all technology used to handle information and communication, such as internet, computer, email, Smartphone, including software supported. Internet is the famous growth parameter of ICT.

Information and communication technology (ICT) has become an important part of most organizations and businesses institutions. Starting from the early 1980's, several researchers suggest that ICT would be an essential part of education systems. The new technologies have the potential to support education across the curriculum and provide opportunities for effective communication between teachers and students in ways that have in the past not been possible or been difficult. It has been that ICT is the most important in effective teaching and learning delivery, economic development, and social change in the globe. In many countries like Singapore, Malaysia, Thailand, and Indonesia, the need for economic and social development is used to justify investments in educational reforms and in educational ICT. Another notable argument to this effect referring to developing countries in general that Information Communication Technology plays a major role in all aspects of national life, such as in politics, in economics, as well as in social and cultural development. It is further argued that ICT is rapidly transforming the way people do business, access information and services communicate with each other and even entertain themselves.

The role of technology in teaching and learning is rapidly becoming one of the most important and widely discoursed issues in modern education policy. Most experts in the field of education agree

that, when properly used, ICT hold great promise to improve teaching and learning in addition to shaping workforce opportunities.

In Africa, concerted efforts have been made by many governments to initiate Internet connectivity and technology training programmers. Such programmers link schools around the world in order to improve education in the 21st century. The developments and exploitation of ICT in schools in the government of Ethiopia has acknowledged the need for ICT training and education in the schools, colleges and universities and the improvement of the education system as a whole. The development of ICT in education results in the creation of new possibilities for learners and teachers to engage in new ways of information acquisition and analysis. ICT also enhances access to education and improve the quality of education delivery on equitable basis. The government of Ethiopia has also made commitment to a comprehensive program of rapid development and utilization of ICT within the education sector to transform the education system. Similarly, it is the desire of Ethiopian government that, through the development of ICT in our Educational Institutions, the cultural practices of the integrated platform is at the early stage of implementation which would be expected to aid students with curriculum-focused multimedia learning, offering open-ended learning tools to help them explore wider concepts and providing valuable exam-focused resources for their preparation for state examinations. ICT adoption is affected by awareness level of the community, availability of required infrastructure or resources, financial capacity, and there are several other contextual factors that need to be explored. In this thesis the aim is assessing ICT adoption in selected secondary schools of Sidama Region for enhanced teaching and learning process as a central concern of the study.

The current practice of the use of the information and communication technology (ICT) in teaching and learning process taking Ethiopia, like the, plasma TV, School Net to mention a few are not properly working , one can consider for example the case of secondary schools of Sidama Region. However, ICT in teaching and learning process has become a force that has changed several aspects of the way live and every aspect of human endeavor (Policy et al. 2005). Therefore, its adoption into the classroom will significantly improve the educational capability.

The use of ICT in education advances itself to more student-centered learning settings and this often creates some tensions among some teachers and students, little emphasis is given to the teaching and learning process functions in schools. But with the world moving rapidly into digital

media and information, the role of ICT in education is becoming more and more important and this importance will continue to grow and develop in the 21st century(Policy et al. 2005). Information and communication technology is used to perform various functions in schools which include; instructional uses such as PowerPoint presentations, record keeping, timetabling, communication, and supervision. However, due to the digital divide, the infrastructure, awareness and several contributing factors, its adoption and use in secondary schools in the Sidama regional state of Ethiopia is not visible. This has slowed down the expected benefits that would arise from the adoption and use of ICT in teaching and learning process in schools.

1.2 Problem Statement

The significance of ICT is quite evident from the educational perspective. Though the chalkboard, textbooks, radio/television, and film have been used for educational purposes over the past years, none has quite impacted on the educational process like the computer. It is further argued that ICT has the capacity to provide higher interactive potential for users to develop their individual, intellectual and creativity ability.

In Ethiopian Education Service there has been made some attempts at attaining the objective of enhancing the nature of education through the use of ICT with the help of some policies. This includes taking ICT as an examinable subject. For example, providing ICT training for ICT teachers aiming at improving teacher's knowledge in the use of ICT tools and in turn impacts it onto students. In spite of every one of these ventures on ICT infrastructure, equipment, and expert advancement to enhance teaching in Ethiopia, it is evident that potential for Information and Communication Technology to help students' learning has not been achieved effectively. The inadequacy of exploiting ICT in secondary schools is attributed to lack of the requisite skills on the part of the teachers, as well as lack of interest on the portion of most teachers in the use of ICT. Hence, it is required to investigate the practice of adoption and use of ICT in selected target secondary schools in Sidama region to examine the facing challenges, identify the local and contextual factors that limit the ICT integration in teaching and learning to come up with solutions for effective and efficient use of ICT. Dei (D. J. A. Dei 2020) revealed that teachers' competence with computer technology is a key factor of effective use of ICT in teaching. (Technology 2002), conducted a "study on 20 teachers' competences and confidence regarding the use of ICT in classrooms" obtained that in Italy, teachers' technical competence with technology is a factor of

improving higher confidence in the use of ICT. Most researchers mentioned that teachers in developing and developed countries have pedagogical and personal factors which mostly contribute to their confidence in adoption and use of ICT. However, it is reported that teachers have plenty of available time to work and practice ICT, support of experienced teachers and training as favorable conditions for gaining confidence in ICT usage. Institutional factors are mentioned to be a facilitating condition towards gaining confidence and use ICT in the teaching and learning process. Studies also indicate that new teachers' confidence level in using ICT depended on personal factors.

According to (A. M. Ibrahim 2018), teachers feel unwilling to use computer if they lack confidence. Fear of failure and lack of ICT knowledge (Bingimlas 2009) have been cited as some of the reasons for teachers' lack of confidence for adopting and integrating ICT into their teaching. Similarly, in a survey conducted by (Farinkia 2005), approximately 21% of the teachers who were surveyed, reported that lack of confidence influence their use of computers in their classrooms. (Bingimlas 2009) stated that many teachers do not consider themselves to be well skilled in using ICT, feel anxious about using it in front of a class of children who perhaps know more than they do. The World Bank survey results from students, teachers, and school principals shows that the existing practice in the integration of ICT in teaching and learning process is not at suitable level. Sidama region is one of the regions of Ethiopia as a federal system. There have been some movements in the region like improving ICT skills in the secondary schools supported by passing policies that make ICT learning mandatory and distributing personal computers to every secondary school. ICT knowledge at school is instrumental in improving academic performance and shaping the brilliant leaders of tomorrow. It is also indicated that several factors impede ICT adoption. Though there are research works on ICT adoption supported by theories and practice elsewhere, there needs more investigations in the context specific to the local situation. Technology adoption models have played important roles by indicating factors that play a role in technology adoption in specific situations, countries, communities, and culture.

Therefore, it is necessary to fill the aforementioned research gaps by studying this vital, but neglected focus area of ICT adoption teaching and learning process. Having in mind, the above lists of motivating factors in to account, the researcher in this case has decided to conduct a study on ICT adoption in selected secondary schools of Sidama Region for enhanced teaching and

learning process; namely, Aletawondo secondary school from Aletawondo town administration; Gordama secondary school and Hula secondary school from Aletawondo woreda.

The following are the research questions that this thesis has tried to answer.

1. What are the factors affecting adoption of ICT in the selected schools of Sidama Region?
2. What are the levels of effectiveness of adoption of ICT?
3. What are the perceived benefits of using ICT in secondary schools?
4. What IT skill is actually used to improve students' ICT practical skill development?

1.3 Objectives of the study

1.3.1 General Objectives.

The objective of this study is to investigate ICT adoption in selected secondary schools of Sidama Region for enhanced teaching and learning process; namely, Aletawondo secondary school from Aletawondo town administration, Gordama secondary school from Aletawondo woreda, and Hula secondary school from Hula woreda.

1.3.2 Specific objective of the study

The specific objectives of the research are:

- To investigate factors affecting ICT adoption for educational environment.
- To identify the levels of effectiveness of adoption of ICT.
- To assess perceived benefits of using ICT adoption in secondary schools.
- To find out those IT skills that actually used to improve students' practical skill development.

1.4 Significance of the Study

This research will provide up to date information on the existing practice of ICT adoption.
The result of the study will benefit the society considering that ICT plays a vital role in education today.

The researcher also believes that the findings of the study might be beneficial not only to the selected schools under investigation but also to ICT teachers and Scholars in general. The other beneficiaries from the overall output of the study is the educational stakeholders like curriculum designers and education policy- makers in order to consider the existing gaps and challenges of

the adoption of ICT at the secondary schools. A proper assessment of teaching and learning with ICTs would be useful to researchers and scholars; as it will add to the already existing scholarly research and literature in the field as well as creating awareness of the constraints of adoption of ICT at the target schools in particular and at secondary schools of the Sidama Regional state or the national level at large.

1.5 Scope of the Study

Conceptually, the delimitation of the study is bounded to assess only the ICT adoption for enhanced teaching and learning process regardless of considering several ICT related and unstudied issues. Secondly, this study work has also geographical boundary. That is, only the selected three sample secondary schools of Sidama regional state (Aletawondo secondary school from Aletawondo town administration; Gordama secondary school from Aletawondo woreda, and Hula secondary school from Aletawondo woreda.),but the other secondary schools in the same regional state or another neighborhood regions will also be excluded. The reason is that shortage of time and labor force as the researcher is student teacher. Finally, this study has time delimitation i.e. only the current academic year on going ICT lesson regarding adoption for enhanced teaching and learning process would be considered, but what had been undertaken during the previous years will not be used as the data source of the study.

1.6 Operational Definition

ICT Adoption: The acceptance of information communication technology in organization, performance prospect, effort expectancy, social influence, and facilitating settings in secondary schools.

ICT: The various set of technological tools and used to communicate and to create, distribute, store and achieve information.

Secondary School: The school middle elementary, college, usually offering general, technical, college-preparatory course.

Performance expectancy: The degree to which an individual believes that ICT adoption will assistance him access school facilities.

Effort expectancy: The degree of easily associated with the utilization of ICT facilities.

Social influence: The extent to which the individuals believe that others believe that they should use ICT services.

Facilitating conditions: The perceived level to which the secondary schools, technical infrastructure required maintenance of ICT services.

1.7 Organization of the Thesis

Firstly, chapter one would be about the introduction which encompasses study background, problem statements, basic research questions, objectives, significance, delimitations, and organization of the study. Secondly, chapter two would present the compiled review literature on the ICT adoption related issues. Moreover, in the third chapter details about methods and procedures of data collection like research design, methodology, data sources, sampling techniques, data gathering tools, and data analysis would be discussed. After this, the data analysis and interpretation for the collected responses would be presented using quantitative description and qualitative discussion. Finally, the last chapters would be about the conclusion, summary, and recommendation followed by reference and appendices.

CHAPTER TWO

2. LITERATURE REVIEW

In this chapter different literature including both conceptual, theoretical bases and related literature is reviewed which helped to identify the gap, learn and gain experience on the research design, method and evaluation.

2.1 Use of ICT adoption theory

ICT adoption is defined as the use of information and communication technologies (ICTs) tools including computer hardware, software, and networks required for connecting to the internet (Okundaye 2016).Within this context, adoption of ICTs can be described as a consisting of three defined stages namely, initiation, adoption, and implementation (Kingdom and Taylor 2019). The initiation stage has to do with assessing the ICT innovation. The adoption stage is one where a decision is made to adopt an ICT innovation. The implementation stages are concerned with effecting the ICT innovation in the firm. Theories signify that perceived ease of use of ICTs is one of the factors to ensue better ICT Adoption.

The easily use of computers and any other electronic devices is a statistically significant determinant of ICT adoption. Accordingly, perceived ease of use refers to the extent to which an individual believes it is easy or requires less effort to use a particular technology in that that technology provides a benefit to the user (Kingdom and Taylor 2019). Researchers (Kingdom and Taylor 2019) have found that perceived easily utilization of computer and web site is a statistically significant determinant of ICT adoption. A technology that is ease of use viewed to be easier to use when compared with another, will tend to be adopted by the user over the other technology. That means, the technology that is seen as being easiest to use than some other is likely to be adopted(Al-rahmi et al. 2019).

2.2 Adoption and Utilization of Information Communication Technology (ICT)

ICT adoption and use can be understood in two ways: Pre-adoption and adoption. In the pre-adoption, people may observe new technology and considering adopting it. In the adoption stage, they form an intention to adopt the technology and they finally purchase and utilize it. ICT can include any physical devices (i.e. cell phone and infrastructure), any computer applications (e.g. Microsoft Word), or any Internet or Web services (e.g. Facebook, Gmail, twitter, Skype etc.). Adoption can be defined as a user's early recognition of an object. Specifically, the object here is infrastructure. The concept of ICT use as the pre-adoption level is employed along with ICT adoption in order to describe the sustained utilization of ICT.

2.3 Theories and Models on Adoptions and utilization of ICT

2.3.1 Adoption Theories

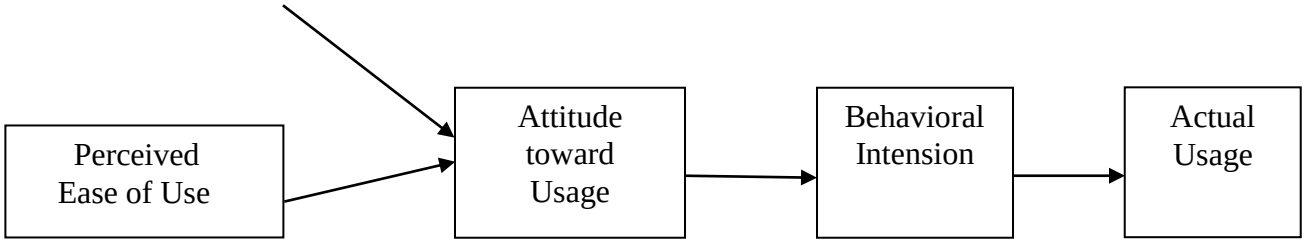
Since ICT adoption and use research mainly employ positivist approach, theories and models have been used at the initial stage of research in order to guide the research and interpret its results (Kim, Hall, and Hall 2004). Theories and models in ICT adoption and use research have played a great role. Theories and models provide frameworks to guide researchers to design and interpret conducted study results. There were good number of theories and models employed in studying individuals. The theories and models focus on people's intention to engage in a certain performance as a main theoretical basis. The basic statement of TRA and TPB is that people consciously determine whether they engage in or do not engage in a certain behavior. In the context of this statement, the adoption and utilization of ICT are usually conceptualized as a mainly outcome variable that is influenced by independent variables.

2.4 Technology Acceptance Model (TAM)

The information system models were mainly established to investigate the factors that lead to the Acceptance and use of new technology for organization or individual (Kabir et al 2017). The achievement of an information system depends on the continuous use and intention to use the new system (Tella & Olasina 2014).The purpose of the Technology Acceptance Model was being for the new technology. TAM which is founded by Davis in 1989 was derived from the Theory of Reasoned Action (TRA) and Theory of Planned Behavior (TPB) which were used to test the users' acceptance of information system. Technology Acceptance Model was set to explain the computer acceptance elements by its users. TAM theorizes that two particular, perceived usefulness and perceived ease of use are vital importance in technology acceptance.

Perceived usefulness (PU) is defined as the prospective user's subjective probability that using a specific application or system will increase his or her job performance within an organizational context.

Perceived ease of use (PEOU) refers to the degree to which the prospective user expects the target system to be free of effort strenuous and otherwise (Davis 1989). The TAM model is basic and theoretical grounding for the current study. The TAM model is shown in figure 2.1.



Source: Davis (1989)

Figure 2.1: Technology acceptance mode

Technology Acceptance Model can be reformed by adding or reducing some variables to satisfy the context of the study (Venkatesh, 2000).The model was developed from a conceptualization of perceived usefulness, perceived ease of use, impact towards behavioral intention to ICT adopt in selected secondary schools in Sidama Regional State.

Perceived usefulness: Perceived usefulness has direct effect on behavioral intentions over and above its effect on attitude and usefulness is far more important than ease of use in a predicting usage.

Attitude toward Usage: This variable is clear as person's positive or negative feelings about performing the goal behavior Attitude can be classified into main construct, attitude toward the purpose, and attitude toward the behavior. According to Davis (1993), attitude towards usage defines as "the degree to which an individual evaluates and associated the target system with his or her job".

Technology Adoption

Technologies that aid collaboration electronic have become an important component of day to day life. Thus several studies have examined the adoption of collaboration technology services and so on. Assumed that adoption of collaboration technologies is not progressing as fast or as broadly as predictable, it seems a different approach needed. New system or new technologies acceptances require input both the managerial or organizational level and the individual level. It is important to understand not only the end user beliefs, attitudes and intentions, but the management strategies, policies and actions which have significant effect on the successful acceptance of a technology (Bhattacherjee, 1998).

2.5 Unified theory of acceptance and use of technology (UTAUT)

There are Critical success factors on the adoption and utilization of ICT in teaching and learning processes. UTAUT shows that performance expectancy, effort expectancy, and social influence have significant relationships with the intention to use technologies (Venkatesh et al., 2003). Later studies found that social influence affect perceived usefulness and perceived ease of use (Kim et al, 2004) . UTAUT is one theory that covers extensive individual difference constructs including gender, age, and experience of use as moderating variables. Even though there are some inconsistencies in previous studies on individual differences, academics reported significant moderating effects according to individual differences such as (Kim et al, 2004). UTAUT provides a refined view of how the determinants of intention and behavior evolve over time. It assumes that there are three direct determinants of intention to use, performance expectancy, effort expectancy, and social influence and two direct determinants of usage behavior, intention, and facilitating conditions (Venkatesh, et al., 2003). These relationships are moderated by gender, age, experience, (Hassen and Spante 2012).

2.5.1 Unified Theory of Acceptance and Use of Technology (UTAUT) model

This study preferred the Unified Theory of Acceptance and use of Technology model is combines technology acceptance model related teachings. The uses of UTAUT purpose to clarify user intentions to use an Information System and consequent behavior. UTAUT suggests four core constructs to explain and guess user acceptance of technology adoption, which are: performance expectancy (equivalent to perceived usefulness), effort expectancy (equivalent to perceived ease of use), facilitating conditions, and social influence.

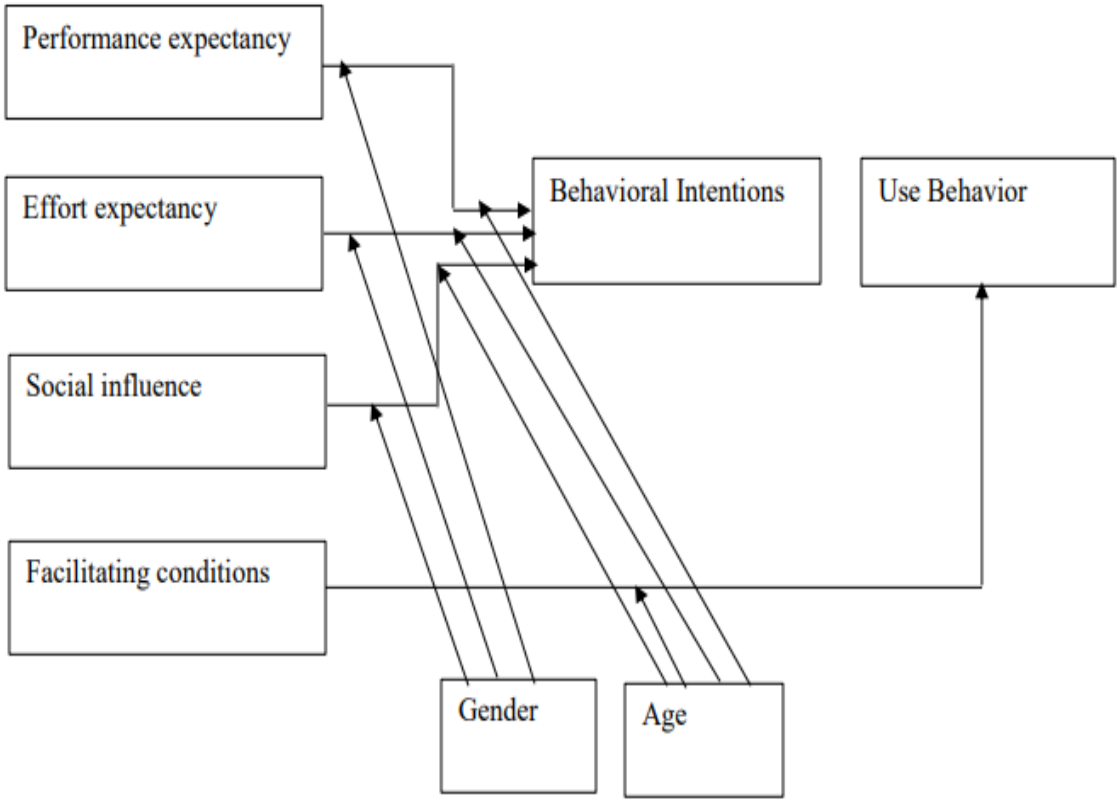


Figure2.2: Unified theory of acceptance and use of technology (UTAUT: Venkatesh et al., 2003) the variables are also Gender and Age which affect the performance of the factors. In the unified technology of acceptance and use of technology, performance expectancy, effort expectancy, and social factors variables have direct effects on the behavioral intention which in chance impacts the use behavior. However, facilitating conditions variable has directly influence on the use behavior.

Performance expectancy: Effort expectancy, Social influence, facilitating conditions behavioral Intentions Use Behavior gender and age. The effect of facilitating conditions on behavioral intention is not considered because it is assumed non-significant when both performance expectancy and effort expectancy have been included (Mohammad-salehi and Tabrizi 2021). These factors affect the use of behavior and consequently ICT adoption.

Effort expectancy: The step of ease associated with the use of the ICT adoption. Effort expectancy imagined to adequate the influence on behavioral intention according to age and gender.

Social influence: The point to which an individual perceives that important others believe he or she should use the new technology. Social influence, assumed to adequate the influence on behavioral intention by gender and age.

Facilitating conditions: The idea of an individual believes that an organizational and technical moderate the influence on use behavioral According to age.

2.6 ICT Adoptions in Education

The utilization of ICT in education improves the teaching and learning process by providing quality education for teachers and students information in an efficient way (Technology 2002). ICT facilitates teaching and learning environment more attractive.

According to (Technology 2002), the use of ICT in education sector supports teachers in carrying out various tasks which include: searching for information and preparing lesson materials; presenting information (e.g. using power point presentations, interactive white boards and LCD projectors) collection and management of data about students' activities; for collaborating with teachers and students; communicating with other students and parents and sharing materials through the networks.

(Technology 2002) mentioned that utilization of ICT which include the use of electronic media, internet platform, and advanced educational technologies results in several benefits: accessibility of online learning materials; better clarifications and insights on the subject taught.

Indeed, while few teachers seem to have no difficulties in integrating ICT in the educational process and have a largely positive opinion about the benefits of ICT in education, many educators do express some form of adverse reactions (Kreijns et al, 2013).

Technology is even seen by some educators as being a source of threat to their traditional way of work (Schmidt et al. n.d.). Consequently, it becomes significant to identify the determinants of ICT adoption in education sector so as to increase its use in the teaching and learning process to teachers and learners.

2.7 The perception of teachers and students on the use of ICT

The teachers in the conducted study affirmed the fact that utilizing of ICT for teaching and learning process increased the student's involvement in the educational process. The Information and Communication Technology integrated teaching and learning motivates academic performance and deal a feeling of success that will move the students from the low of awareness to the dynamic part of creators of information.

In Africa (Education 2020) also explored the influence of ICT integration on the learning pattern of students of University of Bureau in Cameroon and found out that students were more comfortable using ICTs and used it to improve their learning habits. The study also highlighted the positive relationship between students 'approach towards the utilization of ICT and their study custom. According to our country Ethiopia ICT is very important to make attractive teaching and learning environment.

2.8 Effective integration of Information and Communication Technology (ICT) for teaching and learning

Various studies have been conducted on the integration of ICT into teaching and learning in high schools in several countries. (Based 2016) observed that, most of students and teachers use ICTs for entertainment purposes like streaming videos and movies and playing games not use for academic interests. The main reason for the adoption of ICT into education is to improve teaching and learning processes in schools.

From a developing country perspective, most of the researchers have argued that although ICT adoption in developing countries have increased their ICT investments, the ICT teaching learning practice; the anticipated economic gains or benefits are not being realized (Kingdom and Taylor 2019).

Digital effectiveness refers to the skill to exploit ICTs to obtain positive economic returns from ICT adoption. For this to happen, however, practices in developing and underdeveloped countries, for example, must find ways to creatively implementation and utilization of ICTs to add value (Duggan and Virtue, 2004).

ICT for preparing lessons involves teachers 'knowledge in the use of ICT tools in the preparation of classroom exercise. This classroom exercise according to Russell,(A. Ibrahim, Adu-gyamfi, and Kassim 2018) includes preparing teaching materials, cooperating with colleagues, students and their folks. Individual behavior can influence the effective integration of ICT into teaching and learning processes. Teachers understanding in ICT are a major contributing factor for a successful integration of ICT in education sector. ICT as a device for teaching to enhance effective integration involves ICT competence which takes into account the right hardware and software installation.

Educational policymakers in Ethiopia have welcomed the integration of ICT in teaching and learning in secondary schools as an exceptional approach aimed at impacting on knowledge assembly, communication, and information sharing among students and teachers in the several schools.

2.9 Factors influencing the adoption and use of Information and Communication Technology (ICT) for teaching and learning

Despite the use of ICT into educating and learning having numerous benefits and also the system comes with challenges. The uses of ICT for teaching and learning have several challenges and it is more complicated with the introduction of new technologies each and every day (Alizadeh n.d.). The challenges can be classified into five main categories which are resources, knowledge and skills, institution and subject culture (Koehler et al., 2012). Educational policymakers and stakeholders in Ethiopia are focused on the way students and teachers integrate ICT into teaching and learning in the various secondary schools and how this adoption has supported their practices in education sector. Inadequate assets arise when there is the need for ICT to be integrated into teaching and learning processes. Resource may include technology, access to the needed application and support from technical expert. Inadequate technological resources includes obsolete and insufficient computers, incompatible hardware and software (Okundaye 2016), leads to little chance for teachers to include ICT into teaching and students into learning. Integration of ICT into teaching and learning according to (Valtonen et al. 2017), goes beyond the availability of technology in the schools, it includes making the right hardware and software accessible to teachers and learning for utilization. Insufficient time is also a resource-type challenge in the utilization of ICT for teaching and learning. Teachers according to (Ababa, Demeke, and Olden

2012) need more time to go through web pages and to identify pictures they need for multimedia assignment they give to students. Inadequate technical aid as a resource as posited. By (Wart et al. 2017), has led to teachers and student not able to use different technological approaches in integrating ICT into the teaching and learning process.

In Ethiopia, the use of ICT in education is fraught with several challenges such as the ones accessible to both students and teachers easily got damaged due to power fluctuations, obsolete computers, and malware attacks. It has been reported that some of the computer laboratories in the schools surveyed were connected to a server and only few computers are connected to the internet (D. J. A. Dei 2020). The Information communication technology integration with the teaching and learning process the concept of the education changes from the traditional teaching and learning method to new technology system, when all elements of the system are connected together to become a whole education system is change. For instance, the two important elements of teaching and learning which are content and pedagogy must be joined when technology is used in lesson. In other way, if students are offered series of websites or ICT tools (e.g. CD ROMs, multimedia, etc) then the teacher is not integrating ICT into teaching since he/she is not tackling the pedagogical issues. The Information and Communication Technology integration as the means of using some ICT tool Internet and Computer.

Several factors influencing the adoption and integration of ICT into teaching have been identified by researchers. Rogers (2003) identified some technological characteristics or attributes that influence the decision to adopt an innovation. According to (Shaikh 2009), the factors on the use of ICT by teachers were 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, (Dutot, Bhatiasevi, and Bellallahom 2019).Among the factors that influence successful integration of ICT into teaching are teachers' attitudes and beliefs towards technology (Yang et al. 2019). 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. Also the other factor is computer competence. Personal computer Competence able to handle a wide-range of variable computer applications for various purposes (Technology 2002).

Furthermore, there are also factors like teacher workload, institutional characteristics, and professional development highly affecting the adoption of ICT teaching and learning process. Institutional factors help to improve teachers' existing attributes. According to (Kotrlik and Redmann 2009), teacher's time committed to teaching and amount of technology training are reliable factors of technology use in classroom. They asserted that teacher trainers and administrators should not only "provide extensive training on educational technology, but should also facilitate a contribution to teaching improvement" (Tatlı, Akbulut, and Altınışık 2019). The pointed out to the importance of access to technology. Therefore, an understanding of institutional characteristics that influence teachers' adoption and integration of ICT into teaching is relevant.

When we see teachers' professional development, it is a key factor to successful integration of computers into classroom teaching. Several studies have revealed that whether beginner or experienced, ICT-related training programs develop teachers' competences in computer use (Technology 2002) influence teachers' attitudes towards computers as well as assisting teachers reorganize the task of technology and how new technology tools are important in student learning (Omwenga n.d.),The related technology training to successful integration of technology in the classroom.

Teachers' understanding of content knowledge and how to apply technology to support students' learning and attainment are combined to their increase in knowledge level, confidence, and attitudes towards technology. According to (Sociocultural et al. 2011), professional training courses must be designed to identify beliefs about successful teaching, policies for enhanced teaching and learning and program design for teaching purposes. Teachers who are committed to professional development activities gain knowledge of ICT integration and classroom technology organization (Kingdom and Taylor 2019).

Lastly, accessibility and technical support are another factors against .Access to Information and communication technology infrastructure and resources in schools is a necessary condition to the integration of ICT in education (Tatlı, Akbulut, and Altınışık 2019). Effective adoption and assimilation of ICT into teaching in schools depends mostly on the availability and accessibility of ICT infrastructure such as hardware, software, etc. Clearly, if teachers cannot access ICT infrastructure 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. On

the other hand, technical support according to (Hsu 2004) reported that the breakdown of a computer causes interruptions and if there is lack of technical assistance, then it is likely that the regular repairs of the computer will not be carried out resulting in teachers not using computers in teaching.

2.10 Role of Technology in Ethiopia Schools

Ethiopia is one of the African country which have more than 100 million population and 2nd largest populous in Africa. Ethiopia is on the way to implement "Ethiopian Education Development Roadmap (2019-2030)". The study of the roadmap proposed reforms ("Ethiopia and Education Strategy").The Secondary and preparatory schools, Teacher education, Higher education. Replace the Instructional current Satellite TV (Plasma) and radio with ICT technologies and Restructure the traditional learning areas by introducing new learning areas such as Technology and Citizenship Education to shift from the traditional knowledge-focused curriculum to competence-focused curriculum. School Net, a nationwide satellite-based network of Ethiopia's secondary schools provides TV broadcast educational content for more than 2000 secondary schools nationwide. The idea is the local server will be connected to a central server to download the latest digitalized programs locally so it can be accessed by students and teachers in the computer lab than accessing the contents from the TV broadcast only. As part of its efforts to enhance the quality of general education through ICT adoption, MOE have designed a program targeting secondary schools which are already connected to the independent and secured School-Net using 2 Mbps bandwidth and Universities Having Faculty of Education ("Ethiopia and Education Strategy: The Role of Technology").

2.11 Impact of ICT adoption on Teaching and Learning

According to Buabeng-andoh (2012) technology characteristics influence the diffusion processes of an innovation and are significant factors impacting an innovation adoption. The innovation attributes relative advantage, compatibility, and ability. According to IMPICT (2012), ICT is the process of gathering, creating, processing, and storage of information by using hardware, software, as well as the internet and global system of mobile Communication (GSM). However, the communication aspect of ICT adoption is assuming more significance now than ever before, hence, it is now more appropriate to utilization the expression of ICT rather than more information

technology which has become the back bone of the new information based international economy (Yang et al. 2019).

Currently, development has brought about adoption, evaluation of ICT, which is ever growing and continuously affecting every aspect of human endeavor (Abifarina, 2003). Thus, the teacher using ICT in the class would be able to present a well-planned set of lessons and the students will experience these lessons in an exciting environment.

- **Research Gap**

Several studies by (Ayodele and Education 2007); have been done on ICT adoption in the schools of Kenya, Ghana and Nigeria. Based on the researcher's review of related literature, it was not found such a study that has been conducted on the ICT adoption in selected secondary school in Sidama Region for enhancing teaching and learning process. The above studies say little about Ethiopia specifically in Sidama Regional state. Hence there is a contextual gap that this study intended to cover.

Conceptual Model

To determine the relationship between the variables under review, conceptual model was developed. In the conceptual model level of effectiveness of ICT adoption, perceived benefits of using ICT, factors affecting ICT adoption and IT Skills were the independent variables while ICT adoption teaching and learning process is the dependent variable. The Four mentioned variables have influenced on the individual intention to use new technology of the literature. Consequently, this study will employ these variables to propose research model in order to evaluate whether these variables might influence the intention to use ICT adoption teaching and learning process in selected secondary school in Sidama regional State.

The direction of arrows shows an element of fundamental effect which ICT Adoption in one direction. This deals with the overall skeleton of the variables

Independent variables Dependent variables

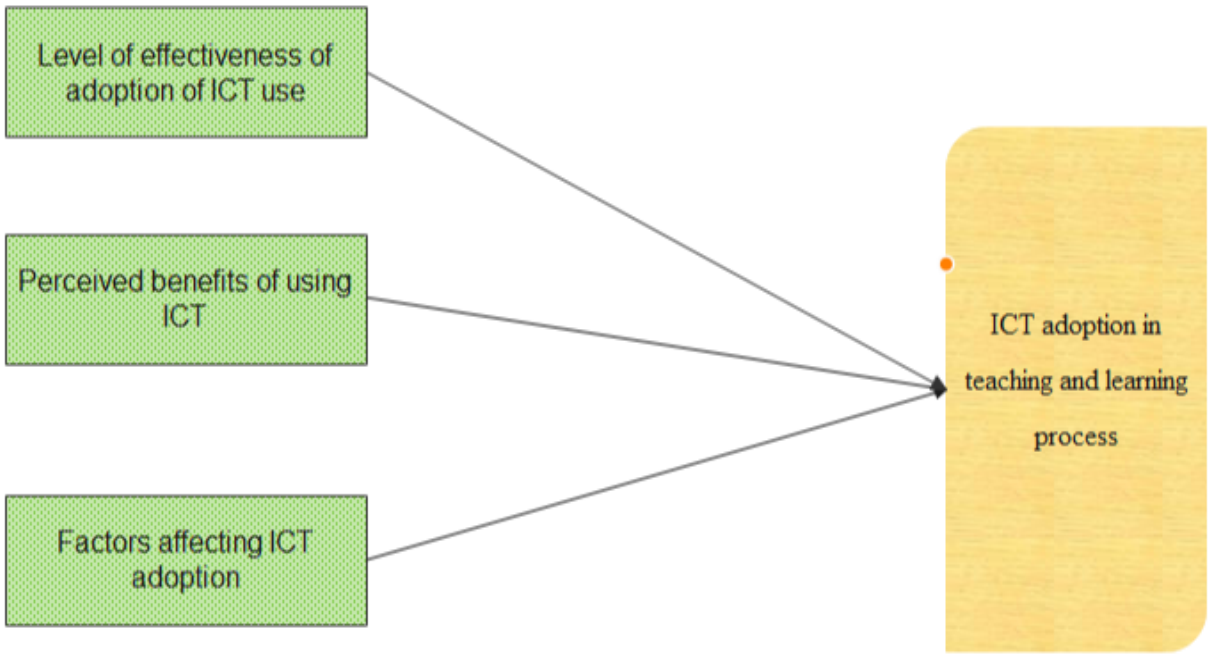


Figure 1.1 **Conceptual Model.**

The purpose of this Conceptual model is to frame on further independent variables to explore on factors influencing ICT and utilization from the local context in selected secondary school in Sidama regional state, Ethiopia.

CHAPTER THREE

3. METHODOLOGY OF THE STUDY

3.1 Research design

The research design selected for this study is a descriptive analysis approach that is frequently used to collect information. This study uses a descriptive survey study aim at ICT adoption in selected secondary school in sidama region for enhancing teaching and learning processes. A descriptive study is concerned with finding the what, where and how of a phenomenon.

3.2 Description of the study area

Sidama region in Aletawondo and Hula woreda is the area where the study was conducted. The choice of Sidama region in Aletawondo and Hula woreda was made based on the researcher's familiarity of the locality, the accessibility of the locality which made easy for the researcher to develop immediate understanding with the respondents hence making data collection less bulky. It is chosen because of its ideal setting, one that is related to the researcher's interest, is easily accessible, and allows the development of immediate understanding with respondents. The study was conducted in Sidama Regional State, Aletawondo and Hula woreda of the Secondary Schools.

3.3 Data Sources

Primary data sources as well as secondary data used as the source of information for this study. Here, the reflections of respondents for questionnaire, interview, and the observation checklist filled by researcher used as the primary data sources. Similarly, the earlier research works and reference books were also been taken as the secondary sources of the study.

3.4 Study population

According to sidama Regional State report in aletawondo and Hula woreda there are 8 secondary schools, their fore, five secondary schools Aletawondo woreada and three seconder schools of Hula woreda Among those are selected from Aletawondo woreda Two secondary schools and One from Hula woreda for this study by using purposive sampling techniques. The selected schools have more ICT facilities and favorable environment, for the study. In this study area 540 student from aletawondo secondary school, 230 student from Gordama secondary schools and 350 from Hula seconder school there are 1120 grade 10^{th} student with 3 principals, 6 vice-principals

and 9 ICT teachers, which is the population of this study. To sum up, the total population of the study were 1138 individuals.

3.5 Sample size and sampling techniques

The sample used in this study drawn from three secondary schools found in Aletawondo and Hula woreda, Namely: Gordama secondary school, Aletawondo secondary school, and Hula secondary school respectively were purposefully selected due to the researcher has had sufficiently of time and chance to get information about each of the secondary schools with regarding to the adoption of ICT to enhance teaching and learning process. Afterwards, simple random sampling technique was drawn for the selection of sample individuals from each of the selected areas. Total population found in the three schools 1120 in grade 10^{th}, students was selected for respondents of the questionnaire of the study. Simultaneously, using sample size. Determination formula noted by Kothari

$n = \frac{z^2 * p * q * N}{e^2(N-1) + z^2 * p * q}$ Where N=size of population

n= sample size

P= Estimate characteristic of the population (p=0.5), q=1- p,

Z= Confidence level (1.96)

e= Acceptable (marginal) error (0.05)

Accordingly on the Kothari formula 287 students were my sample size with 3 principals and 6 vice-principals, and 9 ICT, teachers were selected using purposefully sampling technique.

3.6 Data collection Instruments

In order to get the desired information about the ICT adoption in selected secondary schools of Sidama region for enhanced teaching and learning process, three secondary schools were selected. They were: Aletawondo secondary school from Aletawondo town administration; Gordama secondary school from Aletawondo woreda, and Hula secondary school from Hula Woreda. The researcher used classroom observation, questionnaire, and interview.

3.7 Questionnaire

This questionnaire was prepared in rating scale close ended items. The questionnaire contained 40 questions which were given to 287 target students. These questions were likerate scale item type which comprised of responses; namely, strongly disagree, disagree, somewhat true of me, agree, and strongly agree, highly satisfied, highly unsatisfied, satisfied, medium, unsatisfied. Thus a survey would conduct on which were distributed to the respondents in three secondary schools. Among this 40 questionnaires were returned and only 7 questionnaires respondent were not returned. Due to the sensitivity of the research topic, this population is adequate for this study.

3.7.1 Interview

The researcher also prepared seven open–ended interview guide inquires using short answer item type. Then, the prepared interview guide inquiries were orally presented in person by the researcher to the 3 principals , 6 vice-principals, and 9 ICT teachers of the target schools, i.e. teachers per school Aletawondo secondary schools 4, Gordama secondary schools 2, Hula secondary schools 3. As a whole, 18 interviewees were taken.

3.7.2 Classroom Observation

The observation checklist prepared for this study assessing the ICT adoption in selected secondary schools of Sidama region for enhanced teaching and learning process, namely, Aletawondo secondary school from Aletawondo town administration; Gordama secondary school from Aletawondo woreda, and Hula woreda secondary school from Hula Woreda. For observation, the researcher randomly selected one grade 10 section per each school. The observation had been conducted for three consecutive weeks in each section by the researcher in person.

3.8 Procedures of data collection

The researcher designed tools based on the objectives of the study. The respondents' assured confidentiality of their responses and the researcher confirmed them in that their responses were used only for academic purposes. Each questionnaire was coded, administered, and recollected back from the respondent and the researcher only knew which person responded for the raised questions. The coding technique was only put into use for the purpose of matching returned completed questionnaires with those delivered to the respondents to collect primary data. Finally,

the observation was conducted for three consecutive weeks in the selected section which had been undertaken by the researcher in person.

3.9 Data analysis

The data analysis of this study was conducted using qualitative and quantitative method. . Before processing the responses, the questionnaire was designed and edited for completeness and consistency. Particularly, the responses collected from the reflections of the questionnaire was analyzed using quantitative description which were analyzed ,interpreted, and presented using Statistical Package for the Social Sciences (SPSS) version 20 software. According to Healey (1993), SPSS is the most widely used statistical software in the social sciences, especially for quantitative study. In this case, the results were presented using numerical figures, tables, frequencies and percentages .Then, thematic analysis or else comparative discussion for the reflections of the interviewees as well as observation checklist reflections were qualitatively discussed and interpreted.

3.10 Ethical Consideration

To make the research process professional, the researcher employed ethical consideration. Here, the researcher informed the respondents about the purpose of the study i.e. purely for academic as well as the purpose of the study was also addressed in the introduction part of the questionnaire and interview guide to the respondents. Here, the researcher also confirmed subject's confidentiality, and assured the consent of the respondents. Lastly, all the materials used for this research were acknowledged.

3.11 Pilot Test

3.11.1 Validity

Before the actual study, the researcher was conducted a pilot study. Robson (1993) argued that piloting provides opportunity for researchers to test their confidence in identifying shortcomings that may affect the actual collection of useful data. The pilot study evaluated the effectiveness and validity of the instruments. The purpose was not to collect data but to refine the process and instrument. It provided an opportunity to detect and remedy potential problems such as questions that respondents didn't understand; questions that combined two or more issues in a single question (double-barreled questions); and to exclude questions that might make respondents

uncomfortable. In this regards, the researcher selected grade 10^{th} student 15 and 3 ICT teachers from another nearby secondary school ;namely, Aleta Hidase secondary school in Aletawondo town and gave questionnaire used likerate scale, observation checklist, and interview questions for professional comments and evaluation.

CHAPTER FOUR

4 RESULT AND DISCUSSION

This chapter presents the results of data analysis involving both the quantitative and qualitative techniques. Section 4.1 of this chapter present a quantitative analysis of the data obtained from the questionnaire. This section discusses the basic information derived from analysis of each variable presented through descriptive statistics.

The quantitative data collection instrument has seven parts .Part one of it was designed to collect demographic information of the respondent. Part two was designed to collect data about student level of effectiveness of adoption of ICT use. Part three was designed to collect data on student on perceived benefits of using ICT. Part four was designed to collect data on Availability of ICT infrastructure**.**

Part five was designed to collect data on Factors affecting to using and adoption of ICT and part six was designed to collect data on use of ICT and Readiness and interest. Seven was designed to collect data on use of ICT and IT Skills .The questionnaire has a total of 40 items. Items (except part one) were measured on a five-point Liker-type scales ranging from "strongly disagree", "disagree", "neutral", "agree" ,and "Strongly agree", and "highly satisfied, highly unsatisfied, satisfied, medium and unsatisfied" and Very High, High, Poor, Very poor.

Section 4.2 presents and interprets the findings of qualitative data analysis obtained from the interview to answer research question based on the finding of the research.

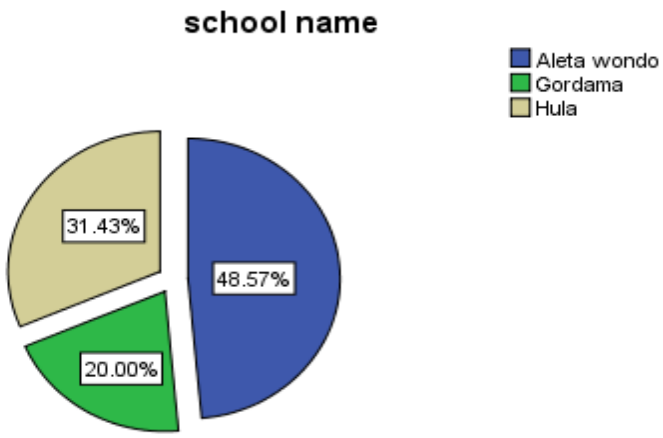


Figure 4.1 Respondent location

4.2 Response Rate

The response rate is the proportion of all people selected who complete the survey parameter and helps in the understanding in the validity of the survey and sources of nonresponse error. At the time of the data collection, the size of the population was 1,120. To collect required data about ICT adoption in selected secondary schools, the questionnaire was distributed to all these potential respondents. As shown in figure 4.2 below, out of 287 respondents 280 (98%) were returned the questionnaires and 7(2%) were not returned. Hence, the analysis and interpretation of the respondents were carried out based on 280(98%) of the collected questionnaires which is enough for this study.

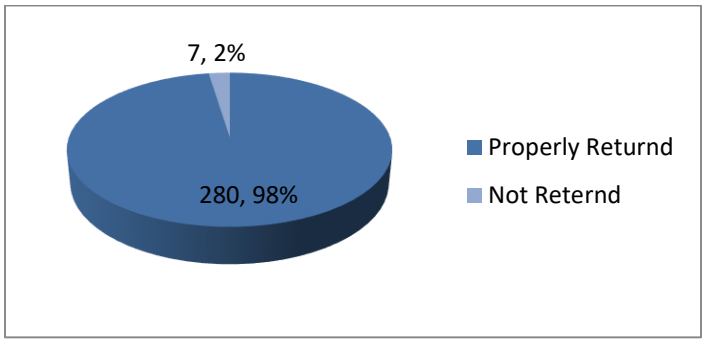


Figure 2.2 Distribution of response rate

4.3 Demographic status of the student respondent

Table4.1 sex and age of the respondent

Gender		Frequency	Percent	Valid Percent	Cumulative Percent
	Female	173	61.8	61.8	61.8
	Male	107	38.2	38.2	100.0
	Total	**280**	**100.0**	**100.0**	
Age	15-18	189	67.5	67.5	67.5
	19-23	52	18.6	18.6	86.1
	24-27	26	9.3	9.3	95.4
	28-30	13	4.6	4.6	100.0
	Total	**280**	**100.0**	**100.0**	

The above table 4.1 shows that from the total of the respondent of 280, 173(61.8%) were females and the remaining 107(38.2%) were males. this indicates that the majority of the respondents were female and also the table shows that the age of the respondents that 15 -18 were 189(67.5%), from 19-23, 52(18.6%), from 24-27, 26(9.3%) and 28-30, 13(4.6%).this table indicates that the majority of the respondent founded in the age of 15-18 which means most of the respondent were 18 and below stages.

4.3.1 Level of effectiveness of adoption of ICT

This study investigates and explores the adoption of information communication technology by the selected secondary schools and the impact it makes on the secondary schools students' academic performance.

Table4.2 Skills and knowledge of ICT Teachers and teaching method of ICT teachers

My ICT Teacher has good Skill and knowledge					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	101	36.1	36.1	36.1
	Disagree	90	32.1	32.1	68.2
	Neutral	10	3.6	3.6	71.8
	Agree	59	21.1	21.1	92.9
	Strongly Agree	20	7.1	7.1	100.0
	Total	280	100.0	100.0	
The teaching Methods of my teacher is nice for understand the lesson					
	Strongly Disagree	90	32.1	32.1	32.1
	Disagree	101	36.1	36.1	68.2
	Neutral	62	22.1	22.1	90.4

Valid					
	Agree	10	3.6	3.6	93.9
	Strongly Agree	17	6.1	6.1	100.0
	Total	280	100.0	100.0	

From the above table 4.2 shows that 101 (36.1%) of the respondent responses that were strongly disagreed. 90(32.1%) of the respondent were disagreed.10 (3.6%) of the respondent were restricted their too gave a response 59 (21.1%) 0f the respondent were have good knowledge and skill of ICT Teachers were agreed. And the remaining 20(7.1%) of the respondent were strongly agreed. The above table 3 indicates that most of the respondent was agreed for lack of knowledge and skill of ICT teachers.

The above table 4.2 also show that 90(32.1%) respondent response strongly disagreed, 101(36.1%) of the respondents were disagree, 62(22.1%) of the respondent restricted to give responses, 10 (3.6%) of the respondent were agreed and the remaining 17(6.1%) were as strongly agreed. These tables indicate that most respondent were have disagreed.

Table4.3 Computer in laboratory and Easy to use the computer

There is a sufficient computer in Laboratory to use and learn ICT and other subject					
		Frequency	Percent	Valid Percent	Cumulative Percent
		219	78.2	78.2	78.2

Valid	Strongly Disagree				
	Disagree	30	10.7	10.7	88.9
	Neutral	17	6.1	6.1	95.0
	Agree	8	2.9	2.9	97.9
	Strongly Agree	6	2.1	2.1	100.0
	Total	280	100.0	100.0	
Easy to use the computer					
Valid	Strongly Disagree	237	84.6	84.6	84.6
	Disagree	31	11.1	11.1	95.7
	Neutral	10	3.6	3.6	99.3
	Agree	2	.7	.7	100.0
	Total	280	100.0	100.0	

The above table 4.3 show that 219(78.2%) of the respondent response strongly disagreed,30(10.7%) of the respondent response Disagreed,17(6.1%)of the respondent were restricted to give response ,8(2.9) respondent were respond agree ,6(2.1%) respondent were response strongly agree. this indicate most of respondent strongly disagreed. the respondents of on the easiness of using computer was 237(84.6%) of respondent were strongly

disagreed.31(11.1%) of the respondent were disagreed. 10(3.6%) of the respondent were restricted to give their response. 2(0.7%) of the respondent were agreed on the easy use of computer. This indicates that the student were not used computer within simple manner. This means they need time and especial support for improving their computer use.

Table4.4 Internet is available in the school, Student in ICT class are active Participant.

Internet is available in the school					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	105	37.5	37.5	37.5
	Disagree	50	17.9	17.9	55.4
	Neutral	23	8.2	8.2	63.6
	Agree	80	28.6	28.6	92.1
	Strongly Agree	22	7.9	7.9	100.0
	Total	280	100.0	100.0	
Student In ICT class are active Participant					
	Strongly Disagree	157	56.1	56.1	56.1
	Disagree	93	33.2	33.2	89.3

Valid	Neutral	5	1.8	1.8	91.1
	Agree	18	6.4	6.4	97.5
	Strongly Agree	7	2.5	2.5	100.0
	Total	280	100.0	100.0	
I have the interest to use the technology in ICT					
Valid	Strongly Disagree	53	18.9	18.9	18.9
	Disagree	20	7.1	7.1	26.1
	Neutral	7	2.5	2.5	28.6
	Agree	103	36.8	36.8	65.4
	Strongly Agree	97	34.6	34.6	100.0
	Total	280	100.0	100.0	

The above table 4.4 show that 105(37.5%) of the respondent response strongly disagreed, 50(17.9%) of the respondent response Disagreed, 23(8.2%) of the respondent were restricted to give response 80(28.6%) respondent were respond agree, 22(7.9%) respondent were response strongly agree. this indicate most of the respondent strongly disagreed and disagreed on the Internet availability on their school.

Table 4 also show that 157(56.1%) of the respondent response strongly disagreed, 93(33.2%) of the respondent response Disagreed, 5(1.8%) of the respondent were restricted to give response 18(6.4%) respondent were respond agree, 7(2.5%) respondent were response strongly agree. this

indicate most of the respondent strongly disagreed and disagreed in the class participation on ICT class. Also the table show that 53(18.9%) of the respondent response strongly disagreed,20(7.1%) of the respondent response Disagreed,7(2.5%)of the respondent were restricted to give response 103(36.8%) respondent were respond agree ,97(34.6%) respondent were response strongly agree. this indicate most of the respondent strongly agreed and agreed in the Interest of using ICT Technologies.

Table4.5 Adequate knowledge on ICT, computer software and computer hardware

I get the adequate knowledge on how to the ICT					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	166	59.3	59.3	59.3
	Disagree	59	21.1	21.1	80.4
	Neutral	11	3.9	3.9	84.3
	Agree	41	14.6	14.6	98.9
	Strongly Agree	3	1.1	1.1	100.0
	Total	280	100.0	100.0	
I have knowledge in the basic computer software and their function					
	Strongly Disagree	209	74.6	74.6	74.6
	Disagree	53	18.9	18.9	93.6

Valid	Neutral	13	4.6	4.6	98.2
	Agree	4	1.4	1.4	99.6
	Strongly Agree	1	.4	.4	100.0
	Total	280	100.0	100.0	
I have knowledge on basic computer hardware and their function					
Valid	Strongly Disagree	117	41.8	41.8	41.8
	Disagree	29	10.4	10.4	52.1
	Neutral	131	46.8	46.8	98.9
	Agree	2	.7	.7	99.6
	Strongly Agree	1	.4	.4	100.0
	Total	280	100.0	100.0	

The above table 4.5 show that 166(59.3%) of the respondent response strongly disagreed, 59(21.1%) of the respondent response Disagreed, 11(3.9%)of the respondent were restricted to give response 80(28.6%) respondent were respond agree ,41(14.6%) respondent were response agree. this indicate most of the respondent strongly disagreed and agreed on the adequate knowledge of ICT .

Table 4.5 also show that 209(74.6%) of the respondent response strongly disagreed, 59(21.1%) of the respondent response Disagreed, 11(3.9%) of the respondent were restricted to give response 41(14.6%) respondent were respond agree 3(1.1%) respondent were response strongly disagree. this indicate most of the respondent strongly disagreed and disagreed in the basic software function. Also the table show that 117(41.8%) of the respondent response strongly disagreed, 29(10.4%) of the respondent response Disagreed, 131(46.8%) of the respondent were restricted to give response 2(0.7%) respondent were respond agree, 1(0.4%) respondent were response strongly disagree and neutral on the basic function of computer hardware. this indicate most of the respondent neutral and strongly disagreed in the basic hardware functions.

4.3.2 Perceived benefits of using ICT

Table4.6 Easy to learn use a particular technology in ICT practical skill and how to use ICT.

I believe that it is easy is to learn and use a particular technology in ICT					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Satisfied	83	29.6	29.6	29.6
	Highly unsatisfied	179	63.9	63.9	93.6
	Medium	18	6.4	6.4	100.0
	Total	280	100.0	100.0	
I improve my practical skill on how to use ICT					
Valid	Highly satisfied	57	20.4	20.4	20.4
	Satisfied	42	15.0	15.0	35.4
	Medium	96	34.3	34.3	69.6
		78	27.9	27.9	97.5

	Unsatisfied				
	Highly unsatisfied	7	2.5	2.5	100.0
	Total	280	100.0	100.0	
I improve my knowledge of data management					
Valid	Highly Satisfied	183	65.4	65.4	65.4
	Satisfied	41	14.6	14.6	80.0
	Medium	52	18.6	18.6	98.6
	Unsatisfied	2	.7	.7	99.3
	Highly Unsatisfied	2	.7	.7	100.0
	Total	280	100.0	100.0	

The above table 6 show that 179(63.9%) of the respondent response highly unsatisfied, 83(29.6%) of the respondent response satisfied, 18(6.4%) of the respondent were medium to give response. This indicates that majority of the respondent highly unsatisfied, this imply that have the problems on easy to learn and use of ICT.

Table 6 also show that 57(20.4%) of the respondent response highly satisfied, 42(15%) of the respondent response satisfied, 96(34.3%) of the respondent were medium to give response 78(27.9%) respondent were respond unsatisfied 7(2.5%) respondent were response highly unsatisfied. this indicate most of the respondent unsatisfied and medium in the improving practical skills. Also the table show that 183(65.4%) of the respondent response highly Satisfied,

41(14.6%) of the respondent response Satisfied, 52(18.6%) of the respondent were medium to give response 2(0.7%) respondent were respond unsatisfied, 2(0.7%) respondent were response highly unsatisfied. this indicate most of the respondent highly satisfied and medium on the I improve my knowledge of data management.

Table4.7 Develop confidence in using ICT technology, good beneficial for academic social and other activities, develop Independent Learning skills.

I develop confidence in using ICT technology					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Highly Satisfied	2	.7	.7	.7
	Satisfied	43	15.4	15.4	16.1
	Medium	26	9.3	9.3	25.4
	Unsatisfied	209	74.6	74.6	100.0
	Total	280	100.0	100.0	
I think that using ICT is good beneficial for academic social and other activities					
Valid	Highly Satisfied	218	77.9	77.9	77.9
	Satisfied	56	20.0	20.0	97.9
	Medium	3	1.1	1.1	98.9
	Unsatisfied	2	.7	.7	99.6
	Highly Unsatisfied	1	.4	.4	100.0
	Total	280	100.0	100.0	
I develop Independent Learning skills					

Valid	Highly Satisfied	51	18.2	18.2	18.2
	Satisfied	19	6.8	6.8	25.0
	Medium	53	18.9	18.9	43.9
	Unsatisfied	87	31.1	31.1	75.0
	Highly Unsatisfied	70	25.0	25.0	100.0
	Total	280	100.0	100.0	

The above table7 show that 209 (74.6%) of the respondent response unsatisfied,43(15.4%) of the respondent response satisfied,18(6.4%) of the respondent were medium to give response. this indicate most of the respondent unsatisfied on the I develop confidence in using ICT technology.

Table7 also show that 57(20.4%) of the respondent response highly satisfied, 42(15%) of the respondent response satisfied, 96(34.3%) of the respondent were medium to give response 78(27.9%) respondent were respond unsatisfied 7(2.5%) respondent were response highly unsatisfied. this indicate most of the respondent unsatisfied and medium in the improving practical skills. Also the table show that 51(18.2%) of the respondent response highly Satisfied, 19(6.8%) of the respondent response Satisfied, 53(18.9%) of the respondent were medium to give response 87(31.1%) respondent were respond unsatisfied, 70(25.0%) respondent were response highly unsatisfied. this indicate most of the respondent highly unsatisfied and unsatisfied in the I develop independent learning skills, therefore ICT adoption have great problems.

4.3.3 Availability of ICT infrastructure/Resources

Table4. 8 Learning Environment in ICT, lack of periodic maintenance and allocate budget for ICT supply.

There is no good Learning Environment for ICT Learning				
	Frequency	Percent	Valid Percent	Cumulative Percent

Valid	Strongly Disagree	210	75.0	75.0	75.0
	Disagree	55	19.6	19.6	94.6
	Neutral	15	5.4	5.4	100.0
	Total	280	100.0	100.0	
There is lack of periodic maintenances of computer and supporting devices in computer lab					
Valid	Strongly Disagree	193	68.9	68.9	68.9
	Disagree	81	28.9	28.9	97.9
	Neutral	6	2.1	2.1	100.0
	Total	280	100.0	100.0	
The allocated Budget for supply ICT facilities is very low					
Valid	Strongly Disagree	217	77.5	77.5	77.5
	Disagree	53	18.9	18.9	96.4
	Neutral	10	3.6	3.6	100.0
	Total	280	100.0	100.0	

The above table8 show that 210(75%) of the respondent response strongly disagreed,55(19.6%) of the respondent response Disagreed,15(5.4%)of the respondent were restricted to give response. this indicate most of the respondent strongly disagreed and disagreed on the good Environment for ICT learning .

table 8 also show that 193(68.9%) of the respondent response strongly disagreed,81(28.9%) of the respondent response Disagreed,6(2.1%)of the respondent were restricted to give response. this indicate most of the respondent strongly disagreed and disagreed in the lack of periodic maintenance of computer lab. Also the table show that 217(75.5%) of the respondent response strongly disagreed,53(18.9%) of the respondent response Disagreed,10(3.6%)of the respondent

were restricted to give response. this indicate most of the respondent strongly disagreed and disagreed in the allocated budget for ICT supply.

Table4. 9 Ratio of computer, internet connection, and software in ICT lab

We do not use one computer for one student					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	269	96.1	96.1	96.1
	Disagree	11	3.9	3.9	100.0
	Total	280	100.0	100.0	
There is frequent internet disconnection problem in our school					
Valid	Strongly Disagree	213	76.1	76.1	76.1
	Disagree	59	21.1	21.1	97.1
	Neutral	8	2.9	2.9	100.0
	Total	280	100.0	100.0	
I have seen lack of update software in ICT lab					
Valid	Strongly Disagree	197	70.4	70.4	70.4
	Disagree	81	28.9	28.9	99.3
	Neutral	2	.7	.7	100.0
	Total	280	100.0	100.0	

The above table9 show that 269(96.1%) of the respondent response strongly disagreed, 11(3.9%) of the respondent response Disagreed. this indicate most of the respondent strongly disagreed and disagreed on the ratio of computers.

Table 9 also show that 213(76.1%) of the respondent response strongly disagreed, 59(21.1%) of the respondent response Disagreed, 8(2.9%)

Of the respondent were restricted to give response. This indicates most of the respondent strongly disagreed and disagreed in the internet connection. Also the table show that 197(70.4%) of the respondent response strongly disagreed,81(28.9%) of the respondent response Disagreed,2(0.7%)of the respondent were restricted to give response. this indicate most of the respondent strongly disagreed and disagreed in the update software availability in ICT labs. This indicated that update software available is highly low in selected secondary schools.

4.3.4 Factor affecting to using adoption and use of ICT

Table4.10 I see lack of space in computer laboratories.

I see lack of space in the computer laboratories					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	33	11.8	11.8	11.8
	Disagree	21	7.5	7.5	19.3
	Neutral	33	11.8	11.8	31.1
	Agree	129	46.1	46.1	77.1
	Strongly Agree	64	22.9	22.9	100.0
	Total	280	100.0	100.0	
I don't often get enough time to practice basic computer skills					
	Strongly Disagree	19	6.8	6.8	6.8
	Disagree	12	4.3	4.3	11.1

Valid	Neutral	37	13.2	13.2	24.3
	Agree	157	56.1	56.1	80.4
	Strongly Agree	55	19.6	19.6	100.0
	Total	280	100.0	100.0	
There are insufficient number of computer					
Valid	Strongly Disagree	17	6.1	6.1	6.1
	Disagree	11	3.9	3.9	10.0
	Neutral	19	6.8	6.8	16.8
	Agree	103	36.8	36.8	53.6
	Strongly Agree	130	46.4	46.4	100.0
	Total	280	100.0	100.0	

The above table4.10 show that 33(11.8%) of the respondent response strongly disagreed, 21(7.5%) of the respondent response Disagreed, 33(18.8%) of the respondent were neutral to give their response, 129(46.1%) of the respondents were agreed and 64(22.9%) of the respondent were strongly agreed. this indicate most of the respondent strongly agreed and agreed on the lack of space in computers laboratory.

Table 10 also show that 19(6.8%) of the respondent response strongly disagreed, 12(4.3%) of the respondent response Disagreed, 37(13.2%) of the respondent were restricted to give response, 157(56.1%) of the respondents were agreed and 55(19.6%) of the respondent were strongly agreed. this indicate most of the respondent strongly agreed and agreed to get enough time for practices for basic computer skill. Also the table show that 17(6.1%) of the respondent response strongly disagreed, 11(3.9%) of the respondent response Disagreed, 19(6.8%) of the respondent were restricted to give response, 103(36.8%) of the respondents were agreed and 130(46.4%) of the respondent were strongly agreed. this indicate most of the respondent strongly agreed and agreed in the insufficient number of computer in ICT lab.

Table4. 11 Background knowledge of ICT, skill of ICT teacher and technical support for ICT teachers

I have ICT background knowledge gap					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	23	8.2	8.2	8.2
	Disagree	26	9.3	9.3	17.5
	Neutral	21	7.5	7.5	25.0
	Agree	97	34.6	34.6	59.6
	Strongly Agree	113	40.4	40.4	100.0
	Total	280	100.0	100.0	
I observe lack of adequate skills of my ICT teachers					
Valid	Strongly Disagree	87	31.1	31.1	31.1
	Disagree	56	20.0	20.0	51.1
	Neutral	34	12.1	12.1	63.2
	Agree	91	32.5	32.5	95.7
	Strongly Agree	12	4.3	4.3	100.0
	Total	280	100.0	100.0	
There is insufficient technical support from teachers					
Valid	Strongly Disagree	16	5.7	5.7	5.7
	Disagree	19	6.8	6.8	12.5
	Neutral	32	11.4	11.4	23.9
	Agree	107	38.2	38.2	62.1

	Strongly Agree	106	37.9	37.9	100.0
	Total	280	100.0	100.0	

The above table4.11 show that 23(8.2%) of the respondent response strongly disagreed, 26(9.3%) of the respondent response Disagreed, 21(7.5%) of the respondent were neutral to give their response, 97(34.6%) of the respondents were agreed and 113(40.4%) of the respondent were strongly agreed. this indicate most of the respondent strongly agreed and agreed on the background knowledge gap on ICT.

table 11 also show that 87(31.1%) of the respondent response strongly disagreed, 56(20%) of the respondent response Disagreed, 34(12.1%) of the respondent were restricted to give response, 91(32.5%) of the respondents were agreed and 12(4.3%) of the respondent were strongly agreed. this indicate most of the respondent strongly disagreed and agreed on skills of ICT teacher. Also the table show that 16(5.7%) of the respondent response strongly disagreed, 19(6.8%) of the respondent response Disagreed, 32(11.4%) of the respondent were restricted to give response, 107(38.2%) of the respondents were agreed and 106(37.9%) of the respondent were strongly agreed. this indicate most of the respondent strongly agreed and agreed in the technical support of ICT teachers.

Table4.12 Using social media to share assignment with friends and teachers and backward class room training.

There is insufficient pedagogical support for teachers				
	Frequency	Percent	Valid Percent	Cumulative Percent

Valid	Strongly Disagree	40	14.3	14.3	14.3
	Disagree	46	16.4	16.4	30.7
	Neutral	19	6.8	6.8	37.5
	Agree	103	36.8	36.8	74.3
	Strongly Agree	72	25.7	25.7	100.0
	Total	280	100.0	100.0	
There is traditional and backward class room training					
Valid	Strongly Disagree	9	3.2	3.2	3.2
	Disagree	13	4.6	4.6	7.9
	Neutral	36	12.9	12.9	20.7
	Agree	101	36.1	36.1	56.8
	Strongly Agree	121	43.2	43.2	100.0
	Total	280	100.0	100.0	
I cannot Telegram and other social media to share assignments and file and with my friend and teachers					
Valid	Strongly Disagree	4	1.4	1.4	1.4
	Disagree	6	2.1	2.1	3.6
	Neutral	39	13.9	13.9	17.5
	Agree	108	38.6	38.6	56.1
	Strongly Agree	123	43.9	43.9	100.0
	Total	280	100.0	100.0	

The above table4.12 show that 40(14.3%) of the respondent response strongly disagreed, 46(16.4) of the respondent response Disagreed, 19 (6.8%) of the respondent were neutral to give their response, 103(36.8%) of the respondents were agreed and 72(25.7%) of the respondent were strongly agreed. this indicate most of the respondent strongly agreed and agreed on the pedagogical support for teachers.

Table4.12 also show that 9(3.2%) of the respondent response strongly disagreed, 13(4.6%) of the respondent response Disagreed, 36(12.9%) of the respondent were restricted to give response, 101(36.1%) of the respondents were agreed and 121(43.2%) of the respondent were strongly agreed. this indicate most of the respondent strongly agreed and agreed on backward class room training. Also the table show that 4(1.4%) of the respondent response strongly disagreed, 6(2.1%) of the respondent response Disagreed, 39(13.9%) of the respondent were restricted to give response, 108(38.6%) of the respondents were agreed and 123(43.9%) of the respondent were strongly agreed. this indicate most of the respondent strongly agreed and agreed on I cannot using Telegram and other social media to share assignments with their friends and teachers.

4.3.5 Readiness and interest

Table4.13 Teacher has low interest to class room training; most students have little motivation in classroom learning.

My teacher has low interest to class room training					
		Frequency	Percent	Valid Percent	Cumulative Percent
	Strongly Disagree	97	34.6	34.6	34.6

Valid	Disagree	91	32.5	32.5	67.1
	Neutral	27	9.6	9.6	76.8
	Agree	35	12.5	12.5	89.3
	Strongly Agree	30	10.7	10.7	100.0
	Total	280	100.0	100.0	
Most students have little motivation in classroom learning					
Valid	Strongly Disagree	3	1.1	1.1	1.1
	Disagree	5	1.8	1.8	2.9
	Neutral	14	5.0	5.0	7.9
	Agree	152	54.3	54.3	62.1
	Strongly Agree	106	37.9	37.9	100.0
	Total	280	100.0	100.0	
There is lack of motivation of my ICT teachers					
Valid	Strongly Disagree	93	33.2	33.2	33.2
	Disagree	101	36.1	36.1	69.3
	Neutral	15	5.4	5.4	74.6
	Agree	30	10.7	10.7	85.4
	Strongly Agree	41	14.6	14.6	100.0
	Total	280	100.0	100.0	
I have low interest to class room training					
Valid	Strongly Disagree	167	59.6	59.6	59.6
	Disagree	94	33.6	33.6	93.2
	Neutral	10	3.6	3.6	96.8

	Agree	9	3.2	3.2	100.0
	Total	280	100.0	100.0	

The above table 13 show that 97(34.6%) of the respondent response strongly disagreed, 91(32.5%) of the respondent response Disagreed, 27 (9.6%) of the respondent were neutral to give their response, 35(12.5%) of the respondents were agreed and 30(10.7%) of the respondent were strongly agreed. this indicate most of the respondent strongly disagreed and disagreed on my teacher has low interest to class room training.

Table4.13 also show that 3(1.1%) of the respondent response strongly disagreed, 5(1.8%) of the respondent response Disagreed, 14(5%) of the respondent were restricted to give response, 152(54.3%) of the respondents were agreed and 106(37.9%) of the respondent were strongly agreed. this indicate most of the respondent strongly agreed and agreed on no class room motivation for learning. Also the table show that 93(33.2%) of the respondent response strongly disagreed, 101(36.1%) of the respondent response Disagreed, 15(5.4%) of the respondent were restricted to give response, 30(10.7%) of the respondents were agreed and 41(14.6%) of the respondent were strongly agreed. this indicate most of the respondent strongly disagreed and disagreed on lack of motivation of ICT teacher. Also the table show that 167(59.6%) of the respondent response strongly disagreed,94(33.6%) of the respondent response Disagreed,10(3.6%)of the respondent were restricted to give response, 9(3.2%) of the respondents were agreed. this indicate most of the respondent strongly disagreed and disagreed on low interest of student in class room training.

4.3.6 IT Skills

Table4.14 Student level of using IT skills

R.No	List of IT skills	Very High		High		Medium		Poor		Very poor	
		Frequency	Per cent	Frequency	Per Cent	Frequency	Per cent	Frequency	Per cent	Frequency	Per cent
1	Typing	1	0.4	3	1.0	37	13.2	191	68.2	48	17.1

2	Document editing	6	2.1	12	4.3	24	8.57	62	22.1	176	62.9
3	Using desktop publisher	-	-	-	-	19	6.78	58	20.7	203	72.5
4	Using spread sheet	-	-	-	-	-	-	140	50	140	50
5	Create database	2	0.7	5	-	13	4.6	-	-	160	57.1

As it was shown above on table 4.14 most of the selected respondents i.e. 191 or 68.2% said that their typing skill was poor as well as 48 or 17.1% assured that they are very poorly understand and exercised the typing skill. That is ,219 respondent or 85.34% of them confirmed that they were poorly or very poorly exercised the typing skills ,hence the can say that there was insufficient support and lesson presentation or weakness in applying teaching method by subject teacher in order student to develop their skill of typing.

Secondly, when are see the document editing skill of the target respondent, majority of them answered i.e. 176 or 62.9% of clearly addressed that there exists very poor extent of student's effectiveness and skill in editing any document.

Following this, as to the third skill i.e. on their skill of using desktop publisher, 203 or 72.5% of them said that they have very poor practical skill in understanding and using desktop publisher.

After this, 50% of the respondent reflections to their skill on using spread sheet were poor. The other half or 50% of the answers also said that they use spread sheet in very poor extent. This shows that all of the target grade student have poor or below the level of skill in using spread sheet.

At the end, the selected sample grade 10 students of the study secondary schools i.e. 160 or 57.1% of them answered that they were very poor in the their skill on applying creating and using data base after the attended the regular ICT class. Therefore all the above five skills presented there for the grade 10 students had shown poor and very poor in using and applying

the five IT skills(typing, editing document, using desktop publisher, using spread sheet, creating and using database) .

4.4 Observation Results of Availability of ICT equipment tools or facilities in the Selected Secondary Schools of Sidama Region.

The observation included checking whether the schools had the following ICT equipment's: sufficient computer laboratory, computer desktops, LCD projectors, and broad band internet connection. The situation was that, if selected secondary schools had given ICT equipment, the researcher would mark it with a tick [√] as shown in table 14. The first objective of this study was used to provide information regarding the availability of ICT equipment's in the selected secondary schools of sidama region. Thus the results of the observation findings were summarized in the table 15.

Table4.15. **Observation**

School name	computer laboratory	computer desktops	LCD projectors	broad band internet connection	Wi-Fi connection
Aletawondo	√	√	-	√	√
Gordama	√	√	√	-	-
Hula	√	√	-	-	-

The above results showed that none of the three (3) selected secondary schools has all the ICT equipment's that were listed in this study as the prerequisite for basic ICT adoption. Furthermore, only one of the schools has a LCD projector and only one school had a Broad band Internet connections and Wi-Fi. Those select secondary schools have insufficient computer laboratory and computer desktops. The above results imply that ICT adoption in respect to the availability of equipment is still very minimal and a lot is yet expected to be done.

4.5 Discussion of Interview obtains from teachers and principals respondents.

The schools principals and vice principals as respondents mentioned that ICT is very important subject in school to facilitate educational process and to improve students motivation. However, the school gives attention for other courses, those that are taken on national examination or university entrance exams. So, based on their response ICT is not required as a core area and not an urgent issue because it is not given on the national examination. The response is an indication that the teaching learning process is dominated by exam orientation.

The ICT teacher's interviewer mentioned that it is difficult to motivate students in a class room just to copy what is written on the blackboard into their notebooks. However, the use of digital devices, such as tablets and PCs, gives students a fresh perspective in the class. The main benefit of ICT in education is that it can deliver information to others visually and audibly, and also allows for interactive lessons between teachers and students, or between students. When the teachers create a situation where students enjoy learning, it will lead to greater satisfaction in the classroom.

According to the school principals and vice principals respondents explained on the idea of using mobile phones to share data; they are aware of it and its potential advantage, putting the infrastructural constraint of sharing data and information over the network in the school environment as it requires either wired or wireless connectivity that might be made available in the school.

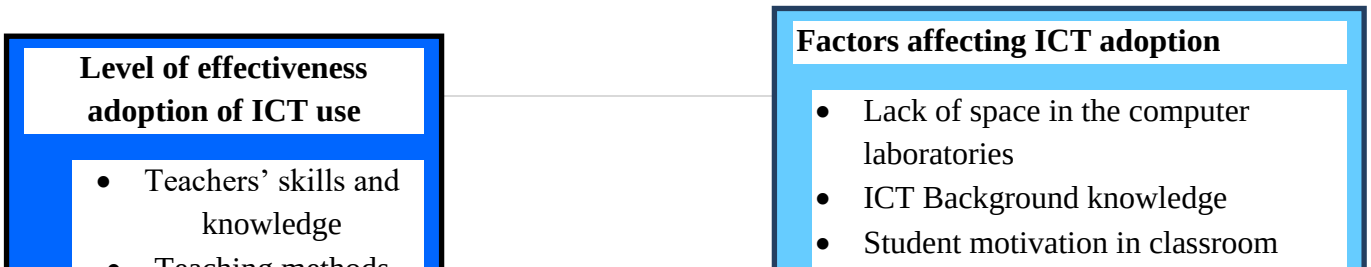
The ICT teacher interviewee mentioned that the ICT infrastructure in the school is insufficient, such as desktop computers, printer is not enough and Networking/Internet and Wi-Fi technology in schools is not available and also they are not maintained to function properly even if some of these devices are available. The respondents revealed that most of the teachers and principals use application software for personal communication only but not for the classroom education purpose. As the respondents mentioned great problems to affect students in ICT adoption are lack of computer access, knowledge and skill gap of students on how to use ICT infrastructure, technology and skill gap as well as commitment challenges of ICT teachers. Most of the students attend the laboratory part rather than the theoretical part. However, without some theoretical background and

motivations it might be difficult to properly operate and use the computer and other ICT devices that might be addressed by the teachers in the teaching process and available infrastructures.

The response from the interview to the school principals and vice principals has an indication of lack of giving attention on the benefits of ICT adoption in the schools. The findings from interviewing teachers show that they perceive the advantages for ICT adoption, but they are complaining ICT infrastructures and materials. This shows the ICT adoption of in the selected secondary school is highly minimal

4.6 CONCEPTUAL FRAMEWORKS

Review of the technological literature of the research model. The objective of this study to investigate the ICT adoption in selected secondary schools of Sidama Region for enhanced teaching and learning process. As this research h develops, the model can be advanced to include intermediate variables.



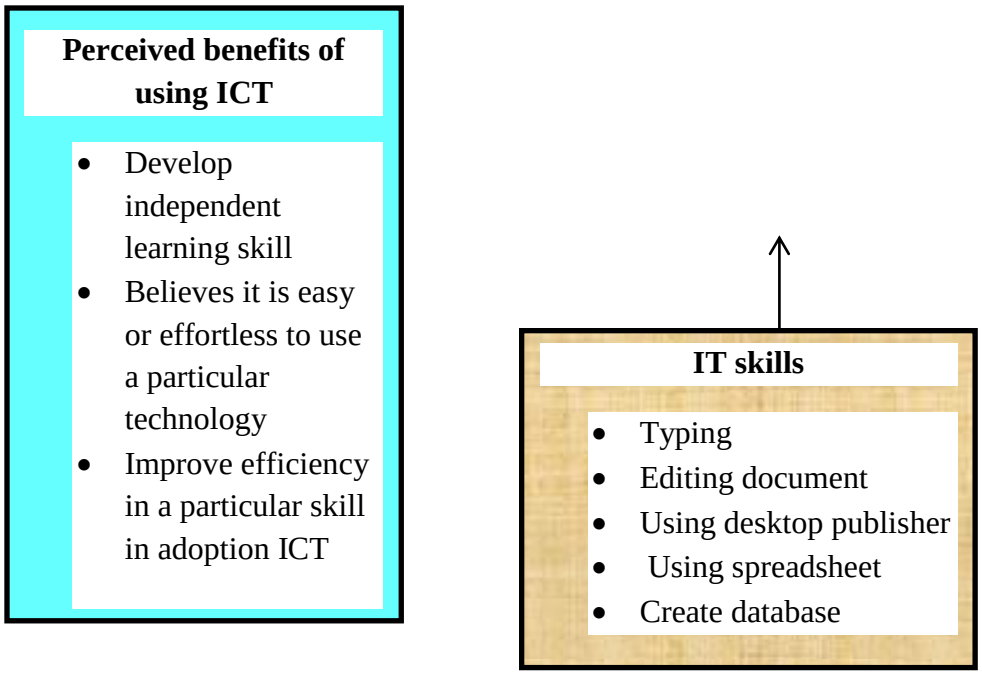


Figure4.3. Conceptual framework– ICT adoption in teaching and learning

The conceptual framework of adoption of ICTs in teaching and learning process is the dependent variable. In this context, ICT adoption of can be described as a containing of the five independent variable, namely, perceived benefits of using ICT, level of effectiveness adoption ICT, factors affecting ICT adoption, Readiness and interest, IT skills. The adoption is one where a decision is made to adopt an ICT in teaching and learning. This indicates that ICTs are used to enhancing of the Teaching and learning process.

Level of effectiveness of adoption of ICT

The level of effectiveness of adoption of ICT very important for enhancing teaching and learning process; so, that includes teachers and skill knowledge, teaching methods, Ease of Use of ICTs, Active participation of students

Teachers and skill knowledge

With the development of learning technologies in the late 21st century, education system has changed rapidly (Ghavifekr et al. 2015). Nowadays, Ministry of education has provided some of facilities and training in order to enhance the use of technologies in the teaching and learning process. As the findings of the study revealed that there are teachers skill gap.

Teacher is must have skill knowledge for ICT adoption in teaching and learning process is the positive influences attitude of the student to adoption Information and communication technology in teaching learning process. Skill knowledge of the teachers has plays a key role in the growth and developing of the ICT adoption based on his or her abilities. In other words, is the teachers who ultimately determine the level of the effectiveness of the ICT adoption teaching and learning process. Further, it has been found that the allocates selected seconder schools enhancing teaching and learning process and so influences ICT adoption in the teaching and learning process level of effectiveness of ICT adoption is developing to the schools.

Teaching methods

Teachers' role is getting more important especially in usage of ICT in pedagogy which could increase the achievement of the students, their creativity, and thinking skills (Ghavifekr et al. 2015).Teachers methods are a great role for the ICT adoption in teaching and learning process, therefore to adopt ICT in the teaching and learning process teacher must use ICT technology materials when teaching in the class room then level of effectiveness is also increase.

Ease of Use of ICT

Technology acceptance model where defined this variable the degree to which the prospective user expects the system to be free of effort respective to mental and physical efforts as well as ease of learning. Perceived ease of use affects perceived usefulness and both variables are significant predictors of attitude toward utilization (Davis, 1989, p.319).

Active participation of students

The students in school are having high expectation on ICT integration in classroom as the new generation is born and grown with technologies and could be define as the digital native phenomenon. The younger the learners, the higher their expectation are on ICT integration and adoption in classroom. The student active participation is very important for the improve skill gap or practice for the ease of use ICT instrument to adoption ICT in teaching and learning process in selected seconder schools**.** The finding of the study shows that active participation and awareness of the students are very important to adopt ICT for enhancing teaching and learning process.

Perceived benefits of using ICT

The use of ICT in the classroom by teachers has also brought about a change in the role of the teacher, taking him or her from the role of a lecturer to a facilitator of learning. Thus, helping students become more independent and more self-sufficient (Publishing 2017).

Moreover, students feel more engaged and motivated when authentic material is used to support learning and when their teachers use cues such as sound, images, and videos clips.

Believes it is easy or effortless to use a particular technology

Perceived usefulness has direct effect on behavioral intentions over and above its effect on attitude (Kim, Hall, and Hall 2004) and usefulness is far more important than ease of use in predicting usage. Perceived usefulness is responsible for the greatest influence on people's intention. Lead to an acceptable level of internal reliability, In addition an individual may adopt a technology if he or she perceives it as convenient, useful and socially appropriate even though they do not enjoy using the technology(Gupta n.d.).

A technology that is viewed to be easier to use when teaching and learning process, In other words, a technology that is seen as being easier to use than some other is likely to be adopted(Kingdom and Taylor 2019). Accordingly, perceived ease of use refers to the extent to which an individual believes it is easy or effortless to use a particular technology (Moghaddam n.d.), in that that technology provides a benefit to the user (Riemenschneider et al., 2003). Research by Igbaria et al. (1997) has found perceived ease of use of personal computer and web site by Teaching and learning process is a statistically significant factor ICT adoption.

Develop independent learning skills

The finding show that most of respondent strongly dis agree that means develop independent learning is very poor and also ICT adoption of selected seconder schools is very low.

Improve efficiency in practical skill in adoption ICT

Teachers improve efficiency in practical skill in adoption ICT increasing the enhancing quality of education in selected in sidama secondary schools.

Factors affecting ICT adoption

The factors affecting ICT adoption such as, ICT background knowledge, Lack of computer space, Traditional classroom training, and individual are identified as influential factors of ICT adoption. The ICT skills and knowledge were studied in the present research as the personal factors which affected adoption of ICT (Moghaddam n.d.).

ICT Background knowledge

Lack of ICT background knowledge is highly affecting ICT adoption in teaching and learning process. Low level of education was not ICT background in seconder schools start it factor affecting ICT adoption**.**

Lack of computer space

The main factor affecting ICT adoption was lack of computer spaces and not enough computer laboratories was the main challenge for ICT adoption in teaching and learning process.

Traditional classroom training

The traditional classroom training is also the main factor affecting ICT adoption, such as chalk and talks presentation.

Student motivation in classroom learning

Lack of student motivation in classroom learning is factor affecting ICT adoption as finding show that student motivation in classroom learning is very low

Readiness and interest

Student readiness and interest is very important for the accepting or reject of the new technology in teaching and learning process.

Information Technology (IT) Skills

IT skills were very important variable to use ICT adoption for enhanced teaching and learning process as well as for business.

Evaluating of the Model

Interview and questionnaires were conducted by this study as means of primary data collection. Based on the responses the model of ICT adoption teaching and learning process was created and sent to ICT teachers who have adopted and implemented the ICT adoption in piloting in Aletahidasse public schools for testing, so as to evaluate the effectiveness of the model, the respondents from sidama region Secondary school ICT teachers told to the researcher about the supposes result and factors affecting of ICT adoption model in sidama region selected secondary school.

Predictable Outcomes for the ICT adoption Proposed Model in Sidama selected Secondary School.

As respondents told to researcher the expected output from ICT adoption are several: Education learning process becomes easier with the help of this model, It is more attractive teaching and learning, enhancing the quality of education, improve students creativity and self-independent educator, students will access materials easily, Communication between teachers and students will become easier with the help of this model by using ICT tools, Teachers will also attach their lectures notes, study material and lesson plans by using ICT tools. This model will play a great role in selected secondary school.

Factor affecting of this Model

There is some factor affecting of ICT adoption the implementation of the proposed model of the selected secondary schools of the sidama region.

Some of the factors are: Lack of skilled man power in the effective use of, Lack of IT skill, Lack of enough power and unreliable Internet connection (poor ICT infrastructure) and ICT illiteracy in the schools and lack of knowledge and skills to use ICT were the main factor affecting to adoption of ICT in selected secondary school of sidama regional state.

CHAPTER FIVE

5 SUMMARY OF THE KEY FINDINGS, CONCLUSIONS, RECOMMENDATIONS, AND FUTURE WORK

5.1 Summary of Key Findings

This section discusses the findings of the study in comparison to what other scholars say as noted under literature review. The analyzed results are compared against the objectives of the research to investigate how far these objectives have been achieved. This research was aimed to investigate ICT adoption in selected secondary schools of Sidama Region for enhanced teaching and learning process; namely, Aletawondo secondary school from Aletawondo town administration, Gordama secondary school from Aletawondo woreda, and Hula secondary school from Hula woreda. In this

study descriptive survey and qualitative and quantitative approach method was used. Hence, the data were collected from 280 students who were chosen randomly with 9 ICT teachers, 3 principals and 6 vice principals were selected purposively. In order to meet the objective of this research and to answer for the research questions, the questionnaires, interview and document analysis was done.

On the ICT adoption in the selected secondary schools study area .the data gathered shows that, ICT adoption is very low. This is due to the deficiency on the lack of computer access, knowledge, and skill of students how to use ICT infrastructure, technology, and skill gap as well as commitment challenges of ICT teachers. As a result the students are not well attracted to access teaching and learning process using ICT adoption in the study areas.

The study show that, 129(46.1%) of the respondent were agreed on the lack of space in computers laboratory. The majority respondent confirmed that it was factor affecting the use of adoption and ICT in selected secondary school.

The study show that 179(63.9%) of the respondent response highly unsatisfied on the easy to learn and use of ICT. This indicates that majority of the respondent were highly unsatisfied. This implies that there were problems in perceived benefits of using ICT.

As the study revealed 90(32.1%) of respondents are disagree on the idea of my ICT teacher has good skill and knowledge, only 20(7.1%) of respondents are agree with this statements, that shows most of the respondent were agreed for lack of knowledge and skill of ICT utilization in the schools. Most of the respondents 219(78.2%) has strongly disagree; on the statement there is a sufficient computer in Laboratory to learn ICT. This revealed that there is insufficient computer in laboratory to learn ICT and any other subject that means there is a great problem on the ICT adoption and also the level of effectiveness of adoption of ICT use were very low.

Most of the selected respondents i.e. 191 or 68.2% said that their typing skill was poor as well as 48 or 17.1% assured that they were very poorly understand and exercise the typing skill. Secondly, the document editing skill of the target respondent, majority of them answered i.e. 176 or 62.9% of clearly addressed that there exists very poor extent of student's effectiveness and skill in editing any document Therefore the skills presented there for had shown poor and very poor in using and applying the IT skills.

As most of the students respondents are strongly disagree on the statements easy to use computer, this findings indicates that the student were not used computer within simple manner. This means they need time and especial support for improving their computer use. According the response of ICT teacher respondents mentioned that the ICT infrastructure in the school is insufficient, such as desktop computers, printer, and Wi-Fi technology is not enough in schools and also they cannot give function properly. The respondents revealed the most of the teachers and principals are use application software for personal communication only but not use to access educational materials. It revealed that adoption of ICT is very low.

5.2 CONCLUSIONS

This study shows that providing ICT training for ICT teachers aiming to improving teacher's knowledge in the use of ICT tools and in turn impacts it on to students. In spite of every one of these ventures on ICT infrastructure, equipment, and expert advancement to enhance teaching in Ethiopia.it is evident that potential for information and communication technology to help students' learning has not been achieved effectively. to achieve the objective of this study that was to investigate ICT adoption in selected secondary schools of Sidama Regional for enhancing teaching and learning process has the key issues were specify, investigate factors affecting ICT adoption for educational environment and perceived benefits of using ICT adoption, assess perceived benefits of using ICT adoption, level of effectiveness of adoption of ICT use and IT skills that students' to understand and apply.

To address the above objectives, the researcher was used descriptive method on the base of questionnaires tool. Data were collected from Aletawondo secondary school, Gordama Secondary school, and Hula secondary school of using questionnaires, interviews, and document analysis. The Forty question of the questionnaire responded by 280 respondents was analyzed using statistical software (SPSS) tools. Qualitative interpretation for the responses of the interview questions and documental analysis was presented using comparative discussion.

The factors affecting the adoption of practical use of ICT have shown some identified limitations such as the deficiency on the lack of computer access, knowledge, and skill of students how to use ICT infrastructure, technology, and skill gap as well as commitment challenges of ICT teachers. Similarly, the students are not well attracted to access teaching and learning process using ICT adoption in the study areas. chalkboard, textbooks, radio/television, and film have been used for educational purposes over the past years, none has quite impacted on the educational process like the computer.

Information and Communication Technology is to help students learning and teaching process and also more attractive teaching and learning environment; however it has not been achieved effectively. The easily use of computers and any other electronic devices is a statistically significant determinant of the ICT adoption. The study showed that most of the respondent strongly disagreed on the availability of the Internet access on their school, therefore level of effectiveness of adoption ICT use was very low since there was less frequent access of internet and cannot use Telegram and other social media to share assignments and file with my friend and teachers. Most of the students has skill gap to use application software on the computer. Respondent confirmed that a lot of factor affecting to use ICT adoption in selected secondary school. The majority of the respondents were highly unsatisfied on the present of developing independent learning skills. So that, almost all of the respondents confirmed that the perceived benefits of using ICT adoption have faced with great problems.

Lastly, regarding IT skills, most of the selected respondents i.e. 191 or 68.2% said that their typing skill was poor as well as 48 or 17.1% assured that they were very poorly understand and exercise the typing and editing skill. Hence, one can say that there was insufficient support and lesson presentation or weakness in applying teaching method by subject teacher in order student

to develop their skill of typing. Therefore the skills presented had shown poor and very poor in using and applying the IT skills.

Using an interview the researcher obtained that the ICT infrastructure in the school is insufficient, such as desktop computers, printer, and Wi-Fi technology is not enough in schools and also they cannot give function properly. There was a gap of ICT adoption awareness and its usage. It revealed adoption of ICT is very low in selected secondary schools of sidama regional state.

Recommendation

The following are the findings of the study, it is clear that the adoption of ICT is important and beneficial in enhancing teaching and learning process in secondary schools. In order to enhance teaching and learning process, there is need the secondary schools management, teachers, and students to adopt and use new technologies at all levels of their operations.

To do this, the paper recommends the following:-

- Training of the secondary schools principal's and deputy's principals on the use of computers.
- Teacher needs to have different training on the new technology.
- Different NGO are invited to support the education sector specially the teaching _ learning condition of ICT.
- The ministry of education in collaboration with other stakeholders should organize in-service training for all teacher/administrators in secondary schools and especially those in management positions.
- The Sidama regional State should prioritize to facilitate sufficient ICT equipment's/materials including of electricity for secondary schools, that makes all schools can enjoy the benefits of ICT.
- Ministry of education should establish the ways of providing computers, tablets, laptops, note books, servers, cloud computing, e-learning, and network devices to schools and their application software.
- The governments should follow up the integration of ICT in all schools.

- The student also properly uses ICT services and infrastructure for their educational purpose including their mobile phone.

5.3 Future Works

This research paper was mainly focused to investigate ICT adoption in selected secondary schools of Sidama Region for enhanced teaching and learning process. This study touches mainly about the adoption of technology and its challenges of Information and Communication Technology adoption. Therefore, the other issues which have not dealt by this study are remained for further study to show the other researcher the direction in which they can focus if they want to investigate on the same topic. This focus area is financial, technical, political, social, and institutional factors as well as the contribution it has on the mentioned issues.

Reference

Ababa, Addis, Wegene Demeke, and Anthony Olden. 2012. "Researching the Adoption of ICT in Ethiopia : A Case Study of Small Hotels in Aslib Proceedings Emerald Article : Researching the Adoption of ICT in Ethiopia : A Case Study of Small Hotels in Addis Ababa." (September).

Abifarina, M. S. (2003) Information and Development of distance Education program me in Nigeria in the 21st Century. Nigeria Journal of Education Studies

Al-rahmi, Waleed Mugahed et al. 2019. "Integrating Innovation Diffusion Theory with Technology Acceptance Model : Supporting Students ' Attitude towards Using a Massive Open Online Courses (MOOCs) Systems." *Interactive Learning Environments* 0(0): 1–13.

https://doi.org/10.1080/10494820.2019.1629599.

Alizadeh, Sima. “Using the TPACK-G Model to Assess High School Teachers ’ Acceptance of Digital Game-Based Learning in View of Perceived Usefulness and Digital Self-Efficacy.”

Ayodele, Adewuyi, and Math Science Education. 2007. “AN ASSESSMENT OF SECONDARY SCHOOL TEACHERS USES OF ICT ’ S : IMPLICATIONS FOR FURTHER DEVELOPMENT OF ICT ’ S USE IN NIGERIAN SECONDARY SCHOOLS .” 6(3): 5–17.

Based, I C T. 2016. “Addis Ababa University.”

Bingimlas, Khalid Abdullah. 2009. “Barriers to the Successful Integration of ICT in Teaching and Learning Environments : A Review.” 5(3): 235–45.

Dei, De-graft Johnson. 2018. “Assessing the Use of Information and Communication Technology in Teaching and Learning in Secondary Schools.”

Dei, De-graft Johnson Amenuveve. 2020. “Assessing the Use of Information and Communication Technology in Teaching and Learning in Secondary Schools.” (May).

Dutot, Vincent, Veera Bhatiasevi, and Nadim Bellallahom. 2019. “Applying the Technology Acceptance Model in a Three-Countries Study of Smartwatch Adoption.” *Journal of High Technology Management Research* 30(1): 1–14.

Davis, F. D.,(1989). Perceived usefulness, perceived ease of use and user acceptance of information technology. MIS quarterly 13(3), 319-340.

Education, Technology. 2020. “Primary Teachers ’ Perceptions on ICT Integration for Enhancing Teaching and Learning through the Implementation of One Laptop Per Child Program in Primary Schools of Rwanda.” 8223(11): 7193–7204.

Farinkia, Ndang Gilbert. 2005. “Factors That Hinder the Implementation of Information and Communication Technology (ICT) in Public Secondary Schools in Fako Division , South West Region of Cameroon.” 5(5): 251–58.

Ghavifekr, Simin, Wan Athirah, Wan Rosdy, and W A W Teaching. 2015. “Teaching and

Learning with Technology : Effectiveness of ICT Integration in Schools Teaching and Learning with Technology : Effectiveness of ICT Integration in Schools."

Hassen, Yasin Ali, and Supervisor Maria Spante. 2012. "Role of ICT for the Growth of Small Enterprises in Ethiopia." (September).

Hsu, Liwei. 2004. "Examining EFL Teachers ' Technological Pedagogical Content Knowledge and the Adoption of Mobile- Assisted Language Learning : A Partial Least Square Approach." 8221(January). http://dx.doi.org/10.1080/09588221.2016.1278024.

Ibrahim, Adamkolo Mohammed. 2018. "Factors Influencing Acceptance and Use of ICT Innovations by Agribusinesses." 26(4): 113–34.

Ibrahim, Alhassan, Mavis Adu-gyamfi, and Bawa Abdallah Kassim. 2018. "Factors Affecting the Adoption of ICT by Administrators in the University for Development Studies Tamale : Empirical Evidence from the UTAUT Model." 4(1): 1–9.

IMPICT (2012), ICT in Education, http://www.mpict.org/ict_education_defined_importance.html

Kingdom, United, and Paul Taylor. 2019. "information and communication technology (ict) adoption by small and medium enterprises in developing countries : the effects of leader , organizational and market environment factors." vii(5): 671–83.

Kabir, M. A., Siti Z.S., & Ahmi, A. (2017). The Influence of Perceived Usefulness and Perceived Ease of Use on the Continuous Intention to Use Electronic Collection System in Nigerian Hospitals: A Conceptual Approach. Asian Journal of Multidisciplinary Studies, 5(6), 225- 229.

Kotrlik, Joe W, and Donna H Redmann. 2009. "Technology Adoption for Use in Instruction by Secondary Technology Education Teachers." 21(1): 44–59.

Moghaddam, Bijan Khalil. "Factors Affecting ICT Adoption among Rural Users : A Case Study of ICT Center in Iran."

Mohammad-salehi, Behrang, and Hossein Heidari Tabrizi. 2021. "Investigating Factors That

Influence EFL Teachers ' Adoption of Web 2 . 0 Technologies : Evidence from Applying the UTAUT and TPACK." 25(1): 1–21.

Okundaye, Kessington Enaye. 2016. "Adoption of Information and Communication Technology in Nigerian Small- to Medium-Size Enterprises."

Omwenga, Elijah I. "Pedagogical Issues and E-Learning Cases : Integrating ICTs into Teaching and Learning Process."

Policy, National I C T et al. 2005. "Adoption and Use of ICT in Enhancing Management of Public Secondary Schools : A Survey of Kesses Zone Secondary Schools in Wareng District of Uasin Gishu County , Kenya."

Publishing, Mcser. 2017. "The Benefits of Using ICT in the EFL Classroom : From Perceived Utility to Potential Challenges Noureddine Azmi." 7(1): 111–19.

Schmidt, Denise A, Ann D Thompson, Matthew J Koehler, and Tae S Shin. "Technological Pedagogical Content Knowledge (TPACK): The Development and Validation of an Assessment Instrument for Preservice Teachers." 42(2): 123–49.

Shaikh, Zaffar. 2009. "Journal of Information Technology Impact." 9(2): 63–80.

Sociocultural, Dataone, Youngseek Kim, Kevin Crowston, and Youngseek Kim. 2011. "TRACE : Tennessee Research and Creative Exchange Technology Adoption and Use : Theory Review for Studying Scientists Continued Use of Cyber-Infrastructure Technology Adoption and Use Theory Review for Studying Scientists ' Continued Use of Cyber-Infrastr." 48: 1–10.

Tatlı, Zeynep, Hava İpek Akbulut, and Derya Altınışık. 2019. "CHANGING ATTITUDES TOWARDS EDUCATIONAL TECHNOLOGY USAGE IN CLASSROOM : WEB 2 . 0 TOOLS." 7(2): 1–19.

Tella, A. & Olasina, G. (2014). Predicting users' continuance intention toward e-payment system: An extension of TAM. International Journal of Information Systems and Social Change 5(1), 47-67.

Technology, Communication. 2002. "Examining the Antecedents of ICT Adoption in Education

Using an Extended Technology Acceptance Model (TAM) Viraiyan Teeroovengadum , Nabeel Heeraman and Bhavish Jugurnath University of Mauritius.” 13(3): 4–23.

———. 2014. “Using the UTAUT Model to Analyze Students ’ ICT Adoption Samuel NiiBoi Attuquayefio Methodist University College , Ghana Hillar Addo University of Professional Studies , Ghana.” 10(3): 75–86.

Utor, Z. S. and Agbi, A. (2005) Realising the Benefit of ICT in Science and Technical Education through enhance library services. A paper presented at the Annual Conference of the School of Science, College of Education, Ekiadotor – Benin

Valtonen, Teemu et al. 2017. “TPACK Updated to Measure Pre-Service Teachers ’ Twenty-First Century Skills.” 33(3): 15–31.

Venkatesh, V (2000). Determinants of Perceived Ease of Use: Integrating Control, Intrinsic Motivation, and Emotion into the Technology Acceptance Model. Journal of Information Systems Research 11(4), 342–365. Retrieved from 1047- 7047/00/1104/0342$05.00 1526-5536

Venkatesh, V., Morris, M.G., Davis, G.D., & Davis, F.D. (2003). User acceptance of information technology: toward a unified view. MIS Quarterly, 27(3), pp. 425-478.

Venkatesh, V., & Morris, M. G. (2000). Why Don't Men Ever Stop to Ask for Directions? Gender, Social Influence, and Their Role in Technology Acceptance and Usage Behavior. MIS Quarterly, 24(1), 115-139.

Wart, Montgomery Van, Alexandru Roman, Xiaohu Wang, and Cheol Liu. 2017. “Telematics and Informatics Integrating ICT Adoption Issues into (e-) Leadership Theory.” *Telematics and Informatics* 34(5): 527–37. http://dx.doi.org/10.1016/j.tele.2016.11.003.

Wingo, Nancy Pope, Nataliya V Ivankova, and Jacqueline A Moss. “Faculty Perceptions about Teaching Online : Exploring the Literature Using the Technology Acceptance Model as an Organizing Framework.” 21(1): 15–35.

Yang, Jinzhong et al. 2019. “A Study of K-12 Teachers ’ TPACK on the Technology Acceptance of E-Schoolbag.” *Interactive Learning Environments* 0(0): 1–14.

https://doi.org/10.1080/10494820.2019.1627560.

Appendix A: Questionnaires.

HAWASA UNIVERSITY Institute of Technology

Department of Informatics

Master of Information Technology (MSc) program

Questioner to be filled by student's respondents

Dear respondents,

The main purpose of this questionnaire is to collect relevant information for research topic in titled. **ICT Adoption in selected Secondary Schools of Sidama Region for Enhanced Teaching and Learning process** .As a partial fulfillment of requirements for the Master of Science (MSc) degree in information technology. Therefore ,your cooperation in filling out the questionnaire should be undertaken carefully and genuinely, apart from contributing towards

the successful completion of the study is a prices less input towards the creation of a levelheaded knowledge regarding the aforesaid issue. So, you are kindly requested to fill in the questionnaire with the necessary information. The result of this study is directly depends up on your honest and genuine response to each question.

I finally want to kindly assure you that each data you supply would be used only for research purpose and that all the information you pride will be confidential & will exclusively be used for research purpose.

Thank you in advance for your collaboration!!

NB

No need of writing your name.

PART I: - Tick your answer on the box your choice among the alternatives presented for each questions.

Name of your school _____

1. Sex :

Male ☐ Female ☐

2. Age: 15-18 ☐ 19-23 ☐ 24-27 ☐ 28-30 ☐

Hint: SD= Strongly Disagree, D= Disagree, N= Neutral, A= Agree, SA=Strongly Agree HS=Highly Satisfied, HU= Highly, U= unsatisfied, S= Satisfied, M= Medium, U= Unsatisfied, VH=very high, H=high, P=poor, VP= very poor.

Appendix B: Interview Guidelines

Hawassa University Institute of Technology Faculty of Informatics, Department of Information Technology

Dear Respondent: I am Master of Science (MSc.) student in Information Technology (IT) at Hawassa University Institute of Technology, Faculty of Informatics, and Department of Information Technology. Currently I conduct a thesis research under the title**: ICT Adoption in selected Secondary Schools of Sidama Region for Enhanced Teaching and Learning process**.

Roll Number	Lists of Items	SD	D	N	A	SA
	I. Level of effectiveness of adoption of ICT use					
1	My ICT teacher has good Skill& knowledge					
2	The Teaching methods of my teacher is nice for understand the lesson					
3	There is a computer in laboratory for me to use and learn ICT and other subjects					
4	Easy to use the computer					
5	Internet is available in the school					
6	Students in ICT class are Active participants					
7	I have the interest to use the technology in ICT					
8	I get the adequate knowledge on how to use the ICT					
9	I have knowledge in basic computer software (ex., Windows, Media Player) and their Functions					
10	I have knowledge on basic computer hardware and their Functions					
	II. Perceived benefits of using ICT	HS	S	M	U	HU
11	I believe that it is easy to learn and use a particular technology in ICT					
12	I improve my practical skill on how to use ICT					
13	I improve my knowledge of data management(e.g personal files)					
14	I develop confidence in using ICT technology					

15	I think that using ICT is good beneficial for academics, social and other activities					
16	I develop independent learning skills					
	III. Availability of ICT infrastructure / resources					
17	There is no good Learning environment for ICT learning					
18	There is lack of periodic maintenances of computer and supporting devices in computer lab					
19	The allocated Budget for supply ICT facilities is very low					
20	We do not use one computer for one student					
21	There is frequent internet disconnection problems in our school					
22	I have seen lack of updating software in ICT lab					
	IV. Factors affecting to using adoption and use of ICT					
23	I see lack of space in the computer laboratories					
24	I don't often get enough time to practice basic computer skills					
25	There are insufficient number of computer					
26	I have ICT Background knowledge gap					
27	I observe lack of adequate skills of my ICT teachers					

28	There is insufficient technical support from teachers					
29	There is insufficient pedagogical support for teachers					
30	There is traditional and backward classroom training					
31	I cannot use Telegram and other social media to share assignments and files with my friends and teachers					
	V. Readiness and interest					
32	My teacher has low interest to classroom training					
33	Most Students have little motivation in classroom learning					
34	There is lack of motivation of my ICT teacher					
35	I have low interest to classroom training					
	VI. Student level of using IT skills	VH	H	M	P	VP
36	Typing					
37	Document editing					
38	Using desktop publisher					
39	Using spreadsheet					
40	Creating database					

I would like to hear your views on this. I hope that you will respond to all of the questions. This study requires that you complete an interview and I kindly request you to answer the interview with at most care and honesty. Your name and any of the information you provide will be kept strictly confidential and will not be attributed to the individual or organization. All responses will

be stored in a secure environment. The results of this research would be used for academic purposes only. Your help would be greatly appreciated.

There in your Thank you very much for your time and cooperation.

Interview Guideline

1. What do you think is the benefit of using ICT in schools?

2. Do you use Mobile phones to share data?

3. What ICT infrastructure available in your school among Desktops, Laptops, Printer, and Photocopy machine, Internet, Wi-Fi?

4. Do you use Mobile phones or other devices to share course materials?

5. What device do you use in schools to access course materials?

6. Do you use social Medias like Telegram, Face book for accessing books and other course material?

7. What problems is school that affects students from using ICT for education?