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# **ICT Use to Improve Education Quality through Plasma TV: Implementation challenges in Selected Secondary Schools in Addis Ababa**

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**June, 2017**

**Addis Ababa, Ethiopia**

**ICT Use to Improve Education Quality through Plasma  
TV: Implementation challenges in Selected Secondary  
Schools in Addis Ababa**

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**Department of Public Administration and Development Management  
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**June, 2017**

## **Declaration**

I, the undersigned, declare that the work contained in this dissertation is my own original work and that I have not previously in its entirety or in part submitted at any university for a degree.

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## **Abstract**

*The education sector of the Ethiopian Government has formulated the ICT in education policy to utilize the ICTs opportunity for the improvement of quality of education. This mainly implemented through the launching of plasma television learning media in all public high schools across the nation. This research assesses the implementation process of plasma mode education and its challenges that are hindering the achievements of education quality goals in secondary schools of Addis Ababa.*

*Mixed methods with qualitative emphasis were applied as a methodology to address the research questions. Primary data were collected through questionnaire in simple random sampling technique by using lottery method. In addition, interviews were conducted face to face with higher officials in Addis Ababa Education Bureau (AAEB), Center for Education Information Communication Technology (CEICT) and directors and teachers from selected secondary schools. Secondary data were collected from several documents. The Data collected from multiple sources was analyzed using both qualitative and quantitative approaches.*

*The research concluded that the goals of provision of quality education through plasma mode education are suffering from several challenges. Based on the analysis and interpretation of data, findings of this research show that there is lack of focus and commitment from education administrators on effective implementation. Lack of interest of teachers as well as students towards learning and teaching through plasma and lack of effective school infrastructure and supply are challenges that this research reveals.*

*The study recommends many topics in order to make effective plasma TV implementation and achieve education quality goals that include revision of the education policy, enhanced collaboration with public service providers, capacity building of teachers, and focused management.*

*Keywords:*

*Plasma Mode Education*

*ICT in Education*

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## Acronyms

AAEB:	Addis Ababa Education bureau Chamber of Commerce and Sectoral Associations
CEICT:	Center for Educational information Communication Technology
EfA:	Education for All
EICTDA:	Ethiopian Information and Communication Technology Development Agency
EMA:	Educational Media Agency
ESDP III:	Ethiopian Education Sector Development Program III
FDRE:	Federal Democratic Republic of Ethiopia
GHz:	Gigahertz
ICT:	Information Communication Technology
LAN:	Local Area Network
MoCB:	Ministry of Capacity Building
MoE:	Ministry of Education
NETN:	National Educational Television Network
PDPs:	Plasma Display Panels
SIP:	School Improvement Plan
TCP/IP:	Transmission Control Protocol/Internet Protocol
TDP:	Teacher Development Program
TGE:	Translational Government of Ethiopia
TV:	Television
UNESCO:	United Nations Educational Scientific and Cultural Organization
VSAT:	Very Small Aperture Terminal
WWW:	World Wide Web

# Chapter One

## 1.1 Introduction

The Ethiopian education sector has given due attention to the use of instructional technology (ICT in education) as part of the mechanisms that are projected to achieve education quality. Accordingly, the Educational Media Agency of the MoE launched educational television program for secondary schools across the country since September 2004. It has been transmitting English, Maths, Physics, Chemistry, Biology and Civic Education for grades 9 to 12. Therefore, this research examines the challenges of the implementation process and the extent to which the program brings any significant change to the education quality goals. This Chapter focuses on the study background, the existing situation of the implementation process, research questions and objectives of the research.

## 1.2 Background of the Study

Information and Communication Technologies (ICT) have become commonplace entities in all aspects of life. As Daniels (2002) stated, it is within a very short time that ICTs have become one of the basic building blocks of modern society. Understanding this, countries are utilizing ICT as part of the core of education, alongside reading, writing and numeracy. It is mainly because as Bottino (2003) said world is moving rapidly into digital media and information and the role of ICT in education is becoming more and more important. Not only this, as cited by Yusuf (2005) ICTs play critical role in education because they have the potential to accelerate, enrich, and deepen skills, to motivate and engage students, to help relate school experience to work practices, create economic viability for tomorrow's workers, as well as strengthening teaching and helping schools change. In line with this, United Nations Educational Scientific and Cultural Organization, UNESCO reports (2002, 2012) also reports that educational systems around the world are under increasing pressure to use the new information and communication technology to teach students the knowledge and skills they need in the 21<sup>st</sup> century.

The Ethiopian government is utilizing the ICTs opportunity for improving quality of education by introducing plasma television learning media in high schools of the country, though the focus of this study is only on public schools of Addis Ababa. As part of this, the Ethiopian Ministry of Education has formulated the use of ICT on students' learning (Mumtaz, 2000). According to the

Ethiopian Education and Training Policy and Its Implementation document by MoE (2002), the Ethiopian Government is utilizing ICT to improve the quality of teaching and learning process.

The idea of using ICT for the improved quality of education is supported by several scholarly articles including Daniels (2004). According to Daniels (ibid), ICT use, particularly plasma based education help students to view animals and plants found in nature in different parts of the world within the classroom at any time desired, and various phenomena that occur at various times. Daniels (ibid) further understand that this technology has helped to show students very expensive and dangerous chemical reactions that cannot be carried out in ordinary classrooms and laboratories in addition to teaching many students simultaneously and in identical and uniform manner. A properly prepared instructional television program not only increases the student's learning or receptive capacity, but also motivates students to follow topics with eagerness and passion (Yusuf, 2005).

As a mode of education delivery, Ethiopia started applying ICT in education following the formulation of policy document (Assefa, 2008). The policy document as stated by Ethiopian Information and Communication Technology Development Agency (EICTDA, 2006) well underlined and placed clear objective and strategies on the integration of ICT in the Ethiopian educational system. Following the formulation of the policy, Ethiopian government formulated three initiatives, namely, Ethiopian National SchoolNet Initiative, the National ICTs in Higher Education Initiatives, the National ICT Education, Training and Awareness Initiative to integrate ICT at different levels of educational systems (ibid). The SchoolNet initiative as stated by (Bitew, 2008) is aimed at facilitating the deployment and the exploitation of ICTs to facilitate, teaching and learning process within the Ethiopian schooling system, including the primary, secondary, technical and vocational schools. Of those different components of ICT integration project, Plasma project was initiated by the Prime Minister Office in 2003 and Ministry of Education and Educational Media Agency were assigned to implement the project (ibid).

The launch of this mode of education as Akalewold et al (2012) stated, exposed the government to high expenditure. Akalewold (ibid) said the assumption was to change the education system to active learning by using plasma technology. The Government also explained specific reasons for the need of the plasma TV mode of instruction; to present abstract concepts in a simplified manner; to transmit uniform education to many students found in different places at the same time; to enable students to have access to model and competent teachers; to demonstrate

laboratory equipment found in one place (classroom) to other learning classrooms (FDRE, 2004). Referring to a report by Ministry of Capacity Building, MoCB (2006), Berhanu (2013) indicates that the main activities that are accomplished in the country's ICT project include, production of Educational TV programs, installation of satellite receiving devices known as Plasma Display Panels (PDPs) in every classroom at secondary level, establishing a computer network system, and installation of satellite TV programs transition system at the center Educational Media Agency (EMA).

However, the implementation process of the policy for ICT in education, which is referred as National Information and Communications Technology Policy, NICTP (2006) particularly in relation to, satellite TV (plasma), is facing several challenges. This paper therefore, is attempted to analyze the challenges of the ICT usage (plasma TV) which aimed at bringing education quality. This study also gives a particular focus on the implementation process of the policy for ICT in education. In addition, this study also looks into the framework consistency and management of the satellite TV broadcast at the selected secondary schools of Addis Ababa.

### **1.3 Statement of the Problem**

On its Education Statistics Annual Abstract, ESAA (2016), the Ethiopian Ministry of Education clearly stated that education is at the center of the government's policies targeted at achieving quality education to provide capable citizens with core literacy and numeracy skills in addition with the middle- and higher-level capacities needed by the emerging productive sectors. As part of this endeavor, the Ethiopian government has formulated the ICT in Education Policy and Implementation Strategy (2006). This document, as stated in ICT in Education Implementation Strategy and Action Plan (2006) is formulated depending on the Education and Training Policy of the 1994 that outlined the mission and goals for the education system of Ethiopia to achieve the present and future national economic and social development goals.

The ICT in Education Implementation Strategy and its corresponding Action Plan are components of a wider Ethiopian national e-education initiative. This initiative forms one of the pillars of the ICT for Development Plan (Harry 2007). Both the ICT in Education Implementation Strategy (2006) and National ICT for Development (2010) Plan recognize ICT as an enhancer for widening access to education for the Ethiopian population, for supporting

literacy education, and for facilitating educational delivery and training at all levels (Assefa 2008).

As part of the implementation of ICT in education, the Education Sector Development Program V (ESDP V, 2015) discusses that ICT infrastructures are provided to schools to receive satellite education transmission to enhance the quality of education at secondary level. Moreover, with the objective of improving the quality of education and supporting teachers, the process has started to make use of SchoolNet service for the 161 preparatory schools (grade 11-12(GEQIP, 2008)). Regarding the objective of the SchoolNet program, ESDP III (2008) stated that it is mainly to support the country's education system with ICT, which involves providing personal computers to schools in setting-up internet laboratories, organizing training for teachers, digitization of existing video-based educational contents for web access and eventually facilitating community access to ICT. In addition to enhancing the quality of educational delivery in the schools, the Internet facility provided through the SchoolNet project would enable teachers to develop their professional qualifications. It would also allow students to access the Internet and other online resources as well as to access global knowledge services and also display and download the content broadcast through the satellite television from Center for Educational Information and Communication Technology (CEICT) to their Local Area Network (LAN).

This is to mean that the national e-education initiative (the SchoolNet) has been in place to improve the quality of secondary education by using ICT. However, both the ICT in education and its implementation pillar, the National SchoolNet initiative that is aimed at the deployment and the exploitation of ICTs to facilitate the teaching and learning process within primary, secondary, technical and vocational schools, in this case the plasma TV education has faced several challenges. According to Bitew (2008) this includes lack of strong implementation process, which demands commitment and continuous improvement.

Regarding the implementation challenges of the ICT for education policy, Harry (2007) also stated that:

*Corresponding ICT for education policy and implementation plan, Ethiopia is set to become a model ICT user on the continent. The infrastructure seems to be falling into place and the policies and*

*strategies are already there. The challenge now is for the government to effectively co-ordinate the implementation of the strategy.*

So far, various researches have been conducted on the areas of plasma television and challenges related to the implementation process. However, the challenges of plasma television are still widely seen in Ethiopian secondary schools. Among others, Wakshum (2013) wrote that though the Ethiopian education policy gives priority for student-centered teaching - learning process and the teacher as facilitator, the plasma television forces them to be passive participants and merely observant, which contradicts with the designed and formulated policy.

Among the researchers, who have conducted researches in the area, Lemlem (2009) is the one who strongly opposed the use of plasma television in secondary schools. She has stated that it would have been better if the plasma television had not been introduced in Ethiopian education at all. She argued that there were no significant changes in Ethiopian secondary schools ever since plasma television has been introduced. Similarly, Kedir (2006) suggested that plasma television is introduced in Ethiopian secondary schools primarily to control the hearts and minds of teachers and students rather than ensuring the equality and uniformity of secondary education throughout the country. Amare (2006) also stated that the use of plasma television leads to a serious educational and social problems because it hinders the learners' mental development such as critical thinking and reasoning abilities.

However, Lemlem (2009), Kedir (2006) and Amare (1998), have concluded the insignificance of the plasma mode instruction rather than suggesting ways that ensure the quality of teaching-learning through plasma education. They all focus on the speed of transmission and the medium of instruction rather than investigating the actual challenges of the implementation process.

On the other hand, there are researchers who greatly encourage the use of plasma television, but still focused on teachers and students attitude towards the program. For instance, Berhanu (2013) focuses on the attitudes of implementing bodies and implementers towards the program. Berhanu (ibid) said, implementing bodies are enthusiastic in developing and expanding the plasma mode of instruction across the country, the key implementers were apathetic in using the medium. These two extreme views (utopian viewpoints of implementing bodies and dystopian viewpoints of key practitioners) are found to be a great impact on the effective practice of the program.

Wakshum (2013) also focuses on the nature of teaching-learning through plasma TV in government secondary schools. He has examined the functions and roles of plasma TV instruction in classrooms and the roles of classroom teachers and the students learning situation through plasma TV.

However, this research examines critical challenges of educational quality that include issues related to ICT in education policy towards the implementation process of plasma education program, institutional infrastructure, issues that are hindering collaboration between teachers, directors and the education bureau of Addis Ababa are also examined. Researches, particularly related to the implementation process of the ICT in education policy are very limited. Therefore, this research also believed to fill the gap in this particular research area.

#### **1.4 Research Questions**

As stated under the statement of the problems section above, the implementation process of ICT in education policy has a lot of unanswered questions and which needs further research. This study posed the following three questions and tried to empirically answer them with a distinct methodology discussed in chapter three:

1. To what extent the use of plasma TV improve education quality in secondary schools?
2. To what extent the educational infrastructures are available for the managements of satellite TV in Secondary Schools?
3. What are the main challenges in the utilization of plasma TV in education service delivery?

#### **1.5 Research Objectives**

The main objective of this study is to analyze the challenges of the ICT use towards satellite TV (plasma) in terms of bringing quality education. Like the research give particular focus on the implementation process of the policy for ICT in education, this study also look in to the consistency and management of the satellite TV broadcast in selected secondary schools of Addis Ababa. In addition to this, the study will have the following specific objectives:

- Assess the extent to which that use of plasma TV improves education quality in secondary schools

- Assess the availability level of required educational infrastructures
- Examine level of collaboration between concerned bodies

## **1.6 Scope of the Study**

The ICT in Education Implementation Strategy and its Corresponding Action Plan are components of a wider Ethiopian national e-education initiative (ICT in Education Implementation Strategy and its Corresponding Action Plan, 2006). It is a major initiative of the Federal Government and the Ethiopian education sector launched and implemented all over the nation. However, this study is limited to public secondary schools of the Addis Ababa City Administration mainly to investigate the achievements, challenges and prospects of the ICT in Education policy with due emphasis on the plasma TV education. Thus, for the purpose of data collection and analysis, the study will cover only secondary schools in Addis Ababa. The implementation process in Addis Ababa is very important since it is the face of the entire nation, for this reason covering secondary schools in Addis Ababa provides the opportunity to assess the achievements and challenges of the policy. Hence, the study will cover selected sub cities in Addis Ababa with due emphasis on the implementation of plasma mode of education program.

## **1.7 Significance of the Study**

The researcher believe that this study is very significant since it assesses the implementation process of the ICT in education policy and the role of satellite TV teaching-learning process towards education quality and factors that affect the implementation process. Accordingly, if there are challenges and no effective utilization of plasma TV and implementation of the policy, it is impossible to achieve fruitful result and quality education.

Therefore, the researcher hoped that this study would:

- Help policy implementation evaluator's, curricular specialists, and other concerned bodies to deal with how to improve the policy implementation process and the teaching-learning through satellite TV in secondary schools.
- Enhance the implementation process and teaching and learning through satellite TV by minimizing those factors affects the proper utilization of TV teaching.
- Serve as a spring board for other researchers to conduct further researches on the challenges and suggest more effective use of satellite TV.

## **1.8 Delimitation of the Study**

This study would have broader picture if it is conducted in all secondary schools of Addis Ababa. However, the study was confined in six selected government secondary schools of Addis Ababa.

## **1.9 Limitations of the Study**

The ICT in education policy and the plasma mode education is implemented in all public secondary schools across the nation. This research specifically addresses only schools located in three sub cities (Arada, Gulele and Kolfe Keraniyo) of Addis Ababa. As a result, the study's sample size may not be large enough due to financial and time constraints and it could be difficult to generalize the findings of the study at all Addis Ababa secondary schools level. Moreover, sufficient recorded materials may not available in secondary schools since plasma television is relatively a recent phenomenon. This research mentioned about the budget allocation for the plasma TV education program. However, there is no available document on audit report.

## **1.10 Organization of the study**

Like any other similar studies, this research paper consists of five major chapters. The first chapter has provided an overview, presents the statement of the problem, introduced the research questions and objectives, established the rationale for significance of the study, specified the scope of the study and at last explained the limitations of the study. And chapter two has introduced conceptual and analytical tools on the basis of which the study phenomenon has been assessed and analyzed. Then chapter three has clearly specified the research methodology, research design, sampling design, methods of data collection and the methods of data analysis. Discussions have been made based on the results of data analysis in the proceeding chapter. At the end, the conclusions and suggested recommendations have been provided based on the findings of the study.

## **Chapter Two: Review of Related Literature**

### **2.1 Chapter overview**

Following the augmentation of student's enrolment and schools expansion, bringing education quality has become the main concern and challenge of the Ethiopian education sector. In order to address education quality related challenges, the Ethiopian Ministry of Education (MoE)/ Addis Ababa Education Bureau (AAEB) has chosen to deploy ICT in education, which now a days involves educational technology and becomes more central to teaching and learning. However, the contribution of ICT in education through plasma mode education is still questionable towards the achievement of educational goals and targets in schools (Berhanu, 2013). It, therefore, makes a logical sense that background of the concept of education technology/plasma mode education can be best understood by looking into backgrounds and uniqueness of the application of education technology and education quality.

This chapter is therefore, aimed at reviewing and analyzing conceptual and theoretical foundations of ICT in education and links the existing body of knowledge to the research questions discussed above in chapter one. All the way round through reviewing theories and backgrounds of ICT in education policy and its contribution towards bringing education quality, this research establishes its particular study within the existing body of literature. The researcher's review of related literature in this chapter has helped also for the development of theoretical framework towards the end of this chapter that has helped for the development of data collection tool.

This section of the research is designed also to review related literature in order to mark out the study with the given conceptual framework. The literature includes educational Policy Implementation and Evaluation towards Effectiveness, Brief history of education policy in Ethiopia, The use of ICT in Education, Implications of ICT-Enhanced Education for Policy and Planning, Ethiopian ICT for Education Initiatives, Plasma TV Mode of Instruction in Ethiopia, Satellite TV Teaching and Learning Process in Ethiopia and Theoretical frame work of the study. These and other topics are discussed as follows.

## **2.2 Theoretical Review**

As indicated in the first chapter of this study, the concept of deployment of ICT in education and effective education service delivery is highly related to the effective implementation of education policy. As instructional technologies including plasma mode education are perceived as potential to improve educational effectiveness and quality, developing countries including Ethiopia are implementing educational policies that are highly integrated with ICT for the purpose of education. This implies that through movements of education policy, the use of instructional technologies has become a trend even if some educators are still concerned with the conventional instruction.

### **2.2.1 The use of ICT in Education**

The whole idea of education quality through the application of plasma mode education is also embedded in ICT in education. As this study is conducted within the context of education quality through educational technology, it is important at this stage to highlight the background of ICT in education and explore options that support the education sector to achieve its quality related goals.

The discussion about the trends occurring in ICT education begins with a brief history. The brief history of ICT raises a number of issues that provide options for thinking about the future and the pathways that ICT may take in education context (White 2006).

Gillies, (2001) said the internet of today was born in 1973 when Vint Cerf developed the TCP/IP. Not only could files be transferred quite simply but also information could be posted for public perusal leading to the emergence of email and news services. The introduction of computers as personal productivity devices first began to appear around 1977 with Apple, Tandy and Commodore computers. Although computers could be connected in networks for the purposes of transferring files although such operations remained complex and technically demanding.

In 1989 Robert Cailliau (Gillies, J. &Cailliau, R., 2001) and Tim Berners-Lee atCERN in Switzerland put forward a proposal for the management of documents using computers. Management at CERN received the proposal as ‘vague but exciting (Gillies, 2001). Cailliau and Berners-Lee envisaged a service that could share files, documents, information, dialogue, graphics, sound files and more. They called this service the World Wide Web (WWW). Networking using WWW continued frenetically until in 2001. Dot com crash rationalized the

services that could be provided and consolidated the first round of the WWW for the provision of information globally.

Throughout this entire period, a computer and desktop software needed to be purchased and software installed. The software included an operating system, applications and utilities for checking viruses and the like. When computers were connected they then required additional software and network servers to communication the internet and use the WWW services (White 2006).

The uses of ICT is making major differences in the learning of students and teaching approaches. Schools in the Western World invested a lot for ICT infrastructures over the last 20 years, and students use computers more often and for a much larger range of applications (Volman2005). Several studies reveal that students using ICT facilities mostly show higher learning gains than those who do not use.

For instance, Kulik's (1994) finding across 75 studies in the United States showed the following: Students who used computer tutorials in mathematics, natural science, and social science score significantly higher on tests in these subjects. Students who used simulation software in science also scored higher. The findings also indicated that primary school students who used tutorial software in reading scored significantly higher on reading scores. Very young students who used computers to write their own stories scored significantly higher on measures of reading skill. Moreover, students who used word processors or otherwise used the computer for writing scored higher on measures of writing skill. Furthermore, the use of ICTs in education also shifts the learning approaches. As put by (Bransford, Brown, and Cocking, 1999), there is a common belief that the use of ICTs in education contributes to a more constructivist learning and an increase in activity and greater responsibility of students. This limits the role of the teacher to supporting, advising, and coaching students rather than merely transmitting knowledge. The gradual progress in using computers changes from learning about computers, to learning computers, and finally to learning with computers (Volman, 2005). On the other hand, teachers' reluctance to adopt innovations need to be seen in the context of existing technology and commitments. Fullen (1989) cited in Watson (2001) states that change or improvement can happen at schools if teachers understand themselves and understood by others. For instance, many teachers are currently not in a position to make informed judgments on ICTs to support

their teaching goals. Clearly a variety of factors still do make using ICT in the curriculum problematic (Watson, 2001). Because of this, the influence of ICT did not bring revolutionary changes at schools. However, the Ethiopian ICT for education policy is struggling to bring effective learning and teaching and an increased result in the implementation of the ICT in education policy.

### **2.2.2 ICT Benefits for Education Quality**

As ICTs are influencing all aspects of life, they are making dynamic changes in society. The influences are felt more and more at schools. Because ICTs provide both students and teachers with more opportunities in adapting learning and teaching from individual to a community need Tinio (2002). The potentials of ICTs in increasing access and improving relevance and quality of education in developing countries further stated by Tinio (2002) as follows:

*ICTs greatly facilitate the acquisition and absorption of knowledge, offering developing countries unprecedented opportunities to enhance education, improve policy formulation and execution, and widen the range of opportunities for business and the poor.*

In addition to this, according to Volman (2005) the uses of ICT is making major differences in the learning of students and teaching approaches. Governments in the Western World and in developing countries invested a lot for educational ICT over the last 20 years, and students use computers more often and for a much larger range of applications. The use of ICTs in education also shifts the learning approaches as cited in Volman (2005), there is a common belief that the use of ICTs in education contributes to a more constructivist learning and an increase in activity and greater responsibility of students.

In line with this, the Ethiopian Government has also invested a lot for ICT education. According Demessew (2006), when the plasma project began, the Ethiopian Ministry of Education requested two South African companies (Kagiso and Sasani) to produce 2978 individual programs of 6 subjects (English, mathematics, physics, chemistry, biology and civics and ethical education) in 12 months. In response, Kagiso and Sesani created what they called ‘a television factory’ in Lyndhurst, Johannesburg, naming it ‘Memar TV’ which means ‘to learn’ in Amharic. During production, Demessew (2006) said 60 teachers, scriptwriters and subject experts, and 80 full-time technical staff participated. The programs included graphics, studio presentations and

visuals taped in both South Africa and Ethiopia. At the end, 450 schools were equipped with 8000 plasma screens. The project was supported by a USD 80-million World Bank loan.

Therefore the purpose of this review is to discuss the benefits of ICT use in education and the impact of huge World Bank loan budget in the enhancement of student learning and experiences of secondary schools in order to asses policy makers, school administrators, and teachers pay the required attention to integrate this technology in the education system of Ethiopia.

### **2.2.3 Education Policy Implementation and Evaluation towards Education Quality**

These days, almost all leaders are making education their main concern. However, as Lingenfelter (2003) said, concern is not enough, it requires accountability systems to measure effectiveness and introduce policies that enhance educational performance. In order to accomplish that, policy evaluation is a key that educators can determine if an accountability system encompasses the conditions to expand the capabilities of the educational institution to convey high quality curriculum and instruction, formulate assessment, and increase student learning (Chester, 2005).

Evaluating education policy is important, as Cooper, Fusarelli, & Randall (2004) said, it conveys ideas, and is relative to education. The failure to examine educational policy will result in insufficient notions of the policy and consequently, deficient policy (Cooper, Fusarelli, & Randall, 2004). Too often after determination, implementation, and funding of policy, individuals presume that the policy will be effective; without evaluation, the policy may not be effective at all. In consideration of policy evaluation, policymaking is a normative process containing values, the basis is found in the organizational structure of policymaking and implementation, constituents affect policymaking and implementation, and policymaking includes a technical dimension, the process of developing and evaluating policy in education (Cooper, Fusarelli, & Randall, 2004).

According to Cooper, Fusarelli, & Randall (2004), policymakers bear insufficient knowledge, time, and resources, and regularly neglect to consider policy changes with individuals which the policy will concern. The establishment of standards, aligning the curriculum, and assessing the outcomes, is three mutually dependent, valuable policy efforts. The practice of recognizing what to teach, how to teach it, and to what degree of capability is applicable to all subjects and all

government levels generates one of the least understood and central elements of education policy evaluation (Cooper, Fusarelli & Randall, 2004; Fuller, Wright, Gesicki, & Kang, 2007; Lingenfelter, 2003).

The same way, depending on the above discussion, the research assesses the result of evaluations of the ICT in education, if there is any. As discussed above, concern in deployment of policy is not enough; it requires accountability systems to measure effectiveness and place supportive measure that enhance educational performance.

#### **2.2.4 The beginning of TV Education and its benefits for education**

After the invention of the first Electronic Television in 1927, TV has been used for several purposes including educational use. It constitutes an important medium widely used to disseminate information to its viewers as it has unique feature of combining audio and visual technology, and thus considered to be more effective than audio media (Sargent 1997). As Olson and Bruner (1974) said though it serves multiple purposes including entertainment its contribution towards information and education is enormous. Besides performing motivational function it helps in providing discovery learning and cognitive development of its viewers. Because of its better accessibility, it can bring learning materials to the masses in more direct, effective and personal way than other educational media (Olson and Bruner, 1974).

TV has deep impact on culture, ideas, way of living and thinking. Sargent (1997: 63) claims ‘Television continues to be the most important medium for conveying information, news and culture in its broadest sense. It is universal in its availability and it is still free at the point of use to its viewers’. MacGregor (2007:15) agrees with this by stating that ‘Television has the greatest impact of all media: it is viewed by people for long periods, commonly between 14 and 28 hours a week; it is visual and entertaining; it can convey quite complex and educational ideas in understandable ways; and because of its impact it is influential among decision makers and governments’.

Use of television as an instructional medium was first reported in 1932 by State University of IOWA in USA on an experimental basis in a world fair. Later on, due to the World War II the introduction of television was slowed down; and as a result by 1948 there were very few educational institutions involved in using television as an instructional medium in spite of great interest in television by the educationists (Magnuson, 1965).

By the late 1950s, 17 programs used television in their instructional materials. The use of educational television tended to grow slowly but by 1961, 53 stations were affiliated with the National Educational Television Network (NET) with the primary goal of sharing films and coordinating scheduling (Hull, 1962). The number of educational television stations grew more rapidly in the 1960s and, by 1972, 233 educational stations existed (Carnegie Commission, 1979). Ohio University, University of Texas and the University of Maryland were among the earliest universities to create networks reach for both on-campus and off campus student populations (Brientenfield, 1968).

Scholars like Hizal (1983) suggest using television for education as it has “enumerates various functions in delivering education through distance mode, like supporting and enhancing teaching; instructing; explaining, clarifying; motivation and encouragement; imposing study speed; presenting a reference to large masses; changing behavior; and presenting unreachable facts and events”.

As a result of technological advancement, the instructional television is becoming interactive. Lochte (1993) said, the instructional television can be interactive (allowing the viewers to interact with instructor or other students live) or passive (airing prerecorded programs). He said two-way television with two-way audio wherein all students could view and interact with the teacher, and simultaneously the teacher could view all participating students through the cameras at remote sites.

The importance of TV education is also favored by Walker (1995) for its audio and visual effects and reported that it can be used to demonstrate processes or physical skills; to show movement; to show visuals that reflect on the color depth cues and motion of the object; can be used for those who lack reading skills; help make distance learning more personalized; make teaching learning live, attractive and dynamic; and is useful for skill development.

MacGregor (2007) also agrees among several uses, educational use of television is a prominent one. He has pointed out that ‘Television is a powerful medium with key roles to play in education in providing news and information, including about education issues, policies and

developments; in the form of dramas, soap operas and other programs with educational messages; and in the delivery of educational support programs to the public and to schools'. Educational relevance of television is a well-researched issue by several scholars of the field. Zechowski (2006) writes 'Educational television is similar throughout the industrialized world. The combination of formal classroom instruction and enrichment programming define the genre. Educational television in the developing world also includes programming which directly affects the quality of life of its viewers'. Similarly, Calvert and Kotler (2003) observe 'The comparison of educational to non-educational favorite programs revealed beneficial effects of educational programs, particularly in the social and emotional area'.

However, the challenges and limitations of television for education are also indicated in several articles. In relation to this, Walker (1995) highlighted some of the limitations of television of its being primarily a one-way communication medium; broadcast is difficult to integrate with other media; both production and transmission of programs are costly; production process is very lengthy; and it is restricted within the effective range of the transmitter or satellite.

The main challenge to the educational television today is well described also by Fisch (2005) 'often, far less attention has been paid to the positive effects that educational television programs can hold'. Palmer (1999) observes 'the record of accomplishments is impressive, yet TV is drastically underutilized as a teaching tool in countries that have the highest prevalence of urgent and otherwise unmet education needs. The large gap that exists between the state of the art and the state of practice in the use of television for development has many causes, including a major lapse of international attention to national capacity building and application'.

For the positive impact of educational TVs (playing key roles in providing enumerates functions in delivering education), the Addis Ababa Education Bureau has placed 3181 plasma screens in its 63 secondary schools. Out of these 3054 plasma TV are working and 127 are not working (Last updated report on July 2016)

### **2.2.5 Theoretical Framework of the Study**

This thesis focuses on examining the education policy implementation process focusing on ICT in education policy/plasma education. For this kind of task, Cooper, Fusarelli& Randall (2004) suggested to deploy the four dimensions of policy theories that are known as normative, structural, constituentive, and technical. Fusarelli& Randall (2004) recommend these dimensions mainly because it threats how policy can improve educational effectiveness, including

curriculum, instruction, and assessment. They also said that this framework enables a researcher to understand and examine policymaking in education through various perspectives.

#### **2.2.5.1 The Structural Dimension**

The structural dimension as discussed by Cooper, Fusarelli & Randall (2004) consists of the values, standards, and philosophies that compel societies to undertake improvement and change. All policies, therefore, are a reflection of society. The structural dimension contains government measures, and an organization's structure, methods, and procedures that declare and advocate educational policies. The examination of the responsibility and influence of federal, state, and local organizational structures is significant to comprehending the way organizations affect educational policy.

Improvement and change is one of the expected output of policy implementation. Therefore, as this thesis assess the improvement and change observed through the implementation process, the structural dimension will be deployed.

#### **2.2.5.2 The Constitutive Dimension**

For Cooper, Fusarelli & Randall (2004) the constitutive dimension encompasses the assumptions of individuals, interest groups, and recipients who apply power over, are a party to, and profit from the policymaking process. This area may include teachers, parents, administrators, business leaders, or government officials. Concerns that this dimension focuses on includes who has a means to influence, how these groups make their desires known, and the degree to which opposing interests can cooperate and find a resolution for all. Here is where the formation of policy takes place by those groups that are both for and against them (Cooper, Fusarelli & Randall 2004).

As this study examines the effect of the policy implementation process on students, teachers, administrators, and government officials, both at the Federal Ministry of Education and Addis Ababa Region Education Bureau, the constitutive dimension will be one of the dimensions that is going to be deployed.

### **2.2.5.3 The Technical Dimension**

This particular dimension as discussed by Cooper, Fusarelli & Randall (2004) incorporates the development, practice, implementation, and assessment of educational policymaking. The comprehension of educational policy necessitates that policymakers contemplate the influence and consequences of educational policies along these dimensions (Cooper, Fusarelli, & Randall, 2004). In this thesis, as I am going to examine and assess the policy practice, the implementation process and the assessments took place, I am going to deploy the technical dimension as one of the Cooper, Fusarelli & Randall (2004) dimensions.

### **2.2.5.4 Normative Dimension**

When applying the normative dimension to the policy evaluation, if the outcome maintains the principles of researchers and educators, then an acknowledgement that a respective policy is valuable and a continuation and expansion of the policy should result. If the outcome does not maintain the principles of researchers and educators, then they may question the data, criticize the process, and discard the outcomes (Cooper, Fusarelli, & Randall, 2004).

Policy evaluation maintains a substantial normative component as researchers establish values, how those values may influence the resources to use, adequate standards, and clarification of the outcomes. A fundamental disagreement in the normative dimension regarding policy evaluation is if significance in the examination exists. A separation transpires involving the positivist and postmodern views. Post positivists reject the scientific viewpoints of scientific examination of the positivists, which are inductive and deductive observations to education policy evaluation. The inductive observation is contingent upon inferring assumptions from data. In a deductive observation, researchers can make, authenticate, test, and perhaps reject a hypothesis (Cooper, Fusarelli, & Randall, 2004).

## **2.3 Empirical Review**

### **2.3.1 Introduction**

In the above section of this chapter, the theoretical issues are discussed. The section highlighted the characteristics of education policy and the implementation process, importance of evaluation towards effectiveness and bringing education quality, the use of ICT for education quality and the satellite television and its benefits. It has also been identified that the Ethiopian Government has

allocated huge budget (80 million USD) secured from World Bank loan for the implementation of ICT in education (plasma mode instruction). The following section reviews the empirical literature on the education quality, practices and challenges of implementing ICT in education/plasma mode education in secondary school and ICT usage in education.

### **2.3.2 Rationales for Educational ICT Policy**

Countries like Ethiopia that have educational ICT policy indicate rationales for policy development. As indicated by Robert (2014), an analysis of national ICT policy statements identifies four alternative, somewhat related rationales that are used to justify the investment of funds on educational ICT. Robert (2014) said some strategic policies promote the use of educational ICT to support economic growth or promote social development. Some policies focus more specifically on the impact of ICT on the education system, either to advance education reform or support education management. The four alternative rationales among which some are picked by the Ethiopian ICT in Education policy are indicated below as stated by (Robert, 2014; Stiglitz & Walsh, 2002; Kozma, 2005).

#### ***2.3.2.1 Support Economic Growth***

A particularly common rationale for investment in educational ICT, which is also pointed out in the ICT in Education of Ethiopia (Assefa, 2008) is the role it can play in preparing a future workforce and supporting economic development. The key to this policy approach is an articulation of specific ways that the educational deployment of ICT can support these broad economic goals, lest the connections between the two be hollow platitudes. For example, a major economic goal for most countries is sustainable economic growth. Economists attribute such growth to increases in productivity, which can include the absorption of more productive equipment, more skilled and productive workforce, and the creation of new knowledge (Stiglitz & Walsh, 2002).

Corresponding educational policies can connect the use of ICT to the development of students' ICT skills which can be applied in the workforce, in developing their capacity to use technology, to solve complex real-world problems that can contribute to productivity, and to the development of new kinds of "21st century" and lifelong learning skills which support knowledge creation, innovation, and entrepreneurialism in a "knowledge economy" (Kozma, 2005).

Robert (2014), referring to (Ashton, Green, Sung, & James, 2002) cited Singapore and Jordan as an example of this approach: Singapore's education policy has always been strongly linked to the

development of human capital. The most recent economic development plan in Singapore challenges businesses and workers to move beyond productivity gains resulting from the pervasive use of technology to the development of a knowledge economy, which relies on the development of new businesses based on research, innovation, and knowledge creation. In coordination with this economic plan, the Education Ministry of Singapore instituted a number of reforms under the title “Learning to Think, Thinking to Learn: Towards Thinking Schools, Learning Nation” (Ministry of Education, Singapore, 2000). Another example of economic-based education ICT policy is that of Jordan. Faced with persistently high unemployment and poverty, the Government of Jordan created a program of economic and social transformation in 2001 to develop high value-added sectors and to establish a knowledge economy. The top priority in this program has been the development of the nation’s human resource. To accomplish this, Jordanian education policy commits the ministry to reform curriculum so as to balance traditional subject matter with learning process outcomes that make effective use of ICT and that engender knowledge creation and management.

### ***2.3.2.2 Promote Social Development***

The other rationale indicated by Robert (2014) is “to promote social development”. As he said, other countries have focused more on the potential social impact of ICT and governments have justified ICT investments with policies that promote their use to share knowledge, foster cultural creativity, increase democratic participation, make government services more widely available, and enhance social cohesion and the integration of different cultural groups and individuals with different abilities. Within education, socially-oriented policies offer the prospect of connections between classrooms across cultures, increased parental participation, student access to specialized educational services, and the delivery of educational services to remote populations. As with the economic rationale, the key is to articulate specific ways that educational ICT can support these broad social goals.

Unlike Ethiopia, the education policy of the European Commission is of this sort. The Commission’s policy of “information society for all” (European Commission, 2000, 2004) emphasizes the need to bring every business, school, home, and citizen into the digital age. One goal of the policy is to promote digital literacy that would provide students with new skills and knowledge that they will need for personal and professional development and for active participation in an information-driven society. The policy also addresses ICT’s contribution to

learning, especially for those who, due to their geographical location, socio-economic situation or special needs, do not have easy access to traditional education and training. Through networking among schools, the policy promotes collaborative projects between countries and cultures that can contribute to improving intercultural dialogue, mutual understanding, and social integration across the Union.

### ***2.3.2.3 Advance Education Reform***

Verspoor (1989) pointed out any major change in an education system can be, and often is, called reform. But, Robert (2014) here used the term to refer to major curriculum revisions, shifts in pedagogy, or assessment changes. ICT can play a particularly important role in supporting education reform and transformation (Means & Olson, 1995; Means, et al., 2004). The kinds of education reforms that have been associated with the introduction of ICT include curriculum reforms that emphasize high levels of understanding of key concepts within subject areas and the ability to apply these concepts to solve complex, real-world problems (Bransford, Brown, & Cocking, 2000). Other curriculum reforms emphasize what are sometimes called “21st century skills”, qualities that prepare students for the knowledge, such as creativity, economy, information management, communication, collaboration, and the ability to direct one’s own work and learning (Resnick & Wirt, 1996).

ICT-related pedagogical changes treat the students as active agents who are engaged in collaborative projects that solve complex, real world-like problems or in sustained investigations and interactions that generate new ideas by building on and extending the ideas of others. The pedagogical role of teachers is to structure and support these practices by providing resources and explicitly modeling cognitive and social processes and prompting students to take up these practices (Bransford, Brown, & Cocking, 2000). International studies have reported the use of these technology-based reforms in schools and classrooms in many countries around the world (Pelgrum & Anderson, 1999; Kozma, 2003b). These ICT-based curricular and pedagogical approaches are beginning to appear in national educational around the world.

Similarly, the South African education ICT policy document (Department of Education, South Africa, 2003, p. 13), states, “Learning through the use of ICTs is arguably one of the most powerful means of supporting learners to achieve the nationally-stated curriculum goals. In particular, the use of ICTs for learning encourages: learner-centered learning; active, exploratory,

inquiry-based learning; collaborative work among learners and teachers; and creativity, analytical skills, critical thinking and informed decision-making.”

#### ***2.3.2.4 Support Education Management***

More generally, some countries advocate the use of ICT to improve the management efficiencies or accountability of schools or the education system. Consequently, these policies emphasize computer-based testing and the use of digital data and management systems. For example, the current educational ICT policy of the United States emphasizes the use of technology to efficiently deliver online content and assessments and to provide principals, teachers, and parents with student performance and attendance data that can be used to personalize instruction, support decision making and the allocation of resources, and promote accountability (Department of Education, United States, 2004). Similarly, the educational ICT policy of Malaysia stresses the use of ICT to increase productivity, efficiency, and effectiveness of education management through office automation and data analysis (Ministry of Education, Malaysia, 2003).

These four policy rationales that are specified by Robert (2014) are not mutually exclusive. Indeed. A number of countries have used two or more of these rationales together in mutually reinforcing ways. The Ethiopian ICT in Education policy somehow combines an economic rationale with an education reform one, arguing that by reforming the curriculum to provide students with learning skills, creative thinking skills, and communication skills they will prepare a workforce with excellence for the future. The indicated rationales also supported by (MoCB, Ministry of Capacity Building, 2006). MoCB (2006) claims that by deploying the ICT in education policy, education quality in secondary schools will be improved, teaching and learning will be facilitated and ICT will be an enabler for widening access to education for the Ethiopian population, for supporting literacy education, and for facilitating delivery and training at all levels. To facilitate this, activities including production of Educational TV programs, installation of satellite receiving devices known as Plasma Display Panels (PDPs) in every classroom at secondary level, establishing a computer network system, and installation of satellite TV programs transition system at the center Educational Media Agency are performed (FDRE, 2004)

### **2.3.3 Interactive satellite instruction and its advantage for learning**

Satellite transmission begins when a program is produced and sent by an earthly stationed transmitter called an uplink to one of the man-made communication satellites located 22,300 miles above the equator (Connett, 1985). This satellite is in geosynchronous orbit; that is, the forward momentum of the satellite is equal to the earth's rotation and because of this, it appears to be motionless (Paritz, 1985). The satellite accepts the uplink signal, amplifies it, and converts it using an electronic receiver/ transmitter known as a transponder. Each transponder has the capacity of two TV programs and 980 telephone calls (Ruggles et al., 1982). Paritz (1985) reported that early satellites had 12-20 transponders; later satellites have up to 27. The satellite redirects the signal back to earth where it is received by a downlink earth station.

The downlink receiving dish converts the signal into sound, video, and data. Paritz (1985) noted that this transmission process takes approximately half a second. Benoit (1985) reported that the C-band and the Ku-band are the most common formats for satellite frequencies. The C-band has a frequency of GHz. Most home earth stations utilize the C-band. The Ku-band has a higher frequency, usually 12-14 GHz. This set of frequencies is more powerful and is more often used by educational networks.

Referring to (Grieve & Singer, 1984), has indicated characteristics of satellite communication that offer advantages over other forms of distance learning:

- (1) Satellite transmission covers a wide geographic area. A satellite's reception area, called a footprint, covers one third of the earth's surface
- (2) The cost of transmission is not determined by distance. The distance between the sender and receiver on earth is insignificant when compared to the distance a signal travels in space
- (3) Instantaneous delivery allows simultaneous communication between widespread locations
- (4) The inaccessible location of a satellite requires that satellite technology is highly reliable

Demessew (2005) said Ethiopian system also uses the Ku-band that has a higher frequency and more powerful educational network. However, the transmission is suffering from frequent power interruption.

### 2.3.4 Teachers and Plasma Guide

Enhanced collaboration between the classroom and television teacher is most recommended by scholars of the education sector. To carry out effective teaching-learning in classroom through instructional television, Windham (1988) suggests that both the classroom teachers and television teachers need to work together in collaboration. Their collaboration can only be realized by using teacher's guide which serves as a vital bridge between a television teacher and classroom teacher as Windham (1988). Nicholls (1983) said this goes on in the classroom before, during and after the program is broadcasted. The main objective of Plasma guide is to give basic ideas to the classroom Teachers on how to use television lesson, what to do and how to do Windham (1988).

The Ethiopian satellite television program lessons are framed under six subsequent stages on the teacher's guide and during transmission (EMA, 2004). These are: Topic of the television program which indicates the topic of the lesson, objective of the television program which shows the objectives of the television program are specific to each period of transmission, content of the television program are specific to each period of the transmission that provides the teachers with the daily content.

As indicated by Tekeste (2006) the following are guides that the classroom teacher performs before, during and after television program and broadcast:

- **Before television program:** the classroom teacher is given different instructions and what she/he has to do before the binning of transmission
- **During the transmission (broadcast):** the classroom teacher is expected to facilitate teaching and learning atmosphere
- **After broadcast (transmission):** the classroom teacher is expected to sum up to the daily lesson by discussing the main points of the daily lesson Generally, in secondary school the daily teaching-learning process through satellite is divided into three phases which lasts about 40 minutes per-period. These are:
- **Before broadcast;** during this period classroom teacher is expected to use 5 minutes to do the following activities: introduces the day's lesson, encourage students by asking

some brainstorm questions, revises the previous lesson if necessary, writes some important formulas and definitions on the blackboard.

- **During the broad cast;** during this time the teacher performs the following: guides and supervises students' performance, help students while doing different exercises given by plasma teacher, explains some words or instructions that students failed to understand.
- **After broadcasting;** at this time the classroom teacher is allowed to use about 5 minutes to do the following activities: discusses the main points of the daily lesson, answers questions raised by students and gives correct feed for exercises and give home-wok (if any).

## **2.4 ICT use for Quality Education in the Context of the Ethiopian education Sector**

The context of ICT use for education quality in general is discussed in the above sub-sections. This section focuses on the context for defining ICT use for education quality in the Ethiopian education sector and existing experiences of using plasma/Satellite television mode of education

### **2.4.1 Brief History of Education and education policy in Ethiopia**

Historical studies of education in Ethiopia including in Teshome (1979) indicated that the traditional education system of the country was religious oriented; and the two institutions that monopolized traditional education for centuries were the Orthodox Church and the Mosque. In fact, church education in Ethiopia has pervaded the norms, values and culture of the existing society and it has been dominantly applicable until recently. The first modern school in Ethiopia was opened for the public in 1908. However; Getenet (2008) indicated that the school curriculum (the essence of the curriculum and the curriculum materials) was predominantly influenced by Western traditions.

The structure of the Ethiopian education system has been changed recently from 6 + 2+ 4 +, to 4 + 4 + 2 + 2 +; that is, 8 years of primary education from year 1 to 8, and subdivided into two cycles: First cycle (basic education) – from year 1 to 4, and Second cycle (general education) – from year 5 to 8; and 4 years of secondary education that is, again, subdivided into two cycles: General secondary education for years 9 and 10, first cycle; and preparatory senior secondary education for years 11 and 12, second cycle(TGE, 1994). Tertiary and higher education is also provided at different levels.

The Ethiopian school's curriculum of the secondary school including in Addis Ababa focuses at enabling students to solve real life problems and become independent, helpful citizens (TGE,1994). The curriculum, particularly for the secondary level of education, is designed at a national level. In fact, nowadays, the Government provided a certain degree of autonomy for the regions to design their own curricula for the primary level of education (year 1 to8) based on some common frameworks. The regions are also allowed to use their own language as a medium of instruction for primary education (Getenet 2008).

However, as Derebessa, (1998:73) said the design of the primary school curriculum is decentralized only to the regional level, and the individual Government schools do not design and implement their own curriculum at any level. The formulation of country's education policy, the determination and supervision of the educational standards, the determination (design) of the curriculum of the secondary schools as well as the preparation of the national exams, lie solely on the hands of the Ministry of Education (MOE) at the national level. Hence, the Ethiopian secondary school curriculum is more centralized. This shows that Ethiopia is still following a top down tradition of curriculum design processes. However, non-government schools including Catholic schools, as Derbessa said have a little more autonomy than the Government schools in the above respect, though they are still using the same national curriculum.

Education receives several definitions by several scholars. Nevertheless, for Volman (2005) education is a process by which transmit experiences, new findings and values accumulated over the years. Education enables individuals and society to make all rounded participation in the development process by acquiring knowledge, ability, skills and attitudes.

In line with this, the Ethiopian Government has developed the education and training policy in 1994 considering education, "as a very important factor to human development, is of a high priority in the overall development endeavor of the government". According to the Education and Training Policy (1994), the education sector respects the varied needs and expectations in the diverse society and continues to strive for a system that strengthens "the individual's and society's problem solving capacity, ability and culture starting from basic education and at all levels".

The Education and Training Policy and Its Implementation (2015) indicated that the education and training policy was formulated because there was no policy direction for the education sector

and the previous educational system had acute and severe problems of both access and quality. It was therefore necessary to replace the educational system “that served the old discarded order by a new one”.

The same document produced on the implementation process indicated that the process of formulation of the policy to some extent was transparent, participatory and democratic. As a result, twenty-two government institutions and sixty-two experts from Addis Ababa University being associated in various committees and contributed to the drafting of the policy. The document has stated, the aim of the study was to formulate a comprehensive and coherent education policy that would be the service of development and democracy, to assess the problems of modern education in Ethiopia, to recommend solutions, and to broadly analyze all education related issues.

The ICT in education policy is also the expansion of the education and training policy; both are formulated to bring education quality at a national level.

#### **2.4.2 Quality of Education in Ethiopia**

As the Ethiopian Government, the main purpose of implementing the satellite TV mode instruction (ICT in education) is to bring quality education that ensures excellence. Developing this national ICT infrastructure improvement plan for general education through strengthening the specification, procurement, distribution and management of ICT in secondary education is also part of the General Education Quality Improvement Program which is indicated in National Education for All (EFA) Review Report (2015). Improving all aspects of the quality of education and ensuring excellence of all is mainly aimed to bring recognized and measurable learning outcomes that are achieved by all, especially in literacy, numeracy and essential life-skills.

Negash (2006), referring to the EFA review report of the 2015 said, until recently international attention has tended to focus on universal primary education, which is the second Millennium Development Goal. A shift in emphasis is now discernible towards quality and learning, which are likely to be more central to the post-2015 global framework. Such a shift is vital to improve education opportunities for the 250 million children globally who have not had the chance to learn the basics, even though 130 million of them have spent at least four years in school.

The Ethiopian government as indicated in EFA Review Report (2015) has launched the General Education Quality Improvement Program that has been operational for five years, currently in its

second phase. This World Bank managed program is designed and implemented in two phases that has been implementing from November 2008. This program is implemented and the second phase became effective in January 2014. This program is designed as a coordinated approach to improving quality of education across the national, in all primary and secondary schools. This program follows the Ministry of Education's General Education Quality Improvement Package, designed to support quality improvements for all primary and secondary schools. The current phase as indicated in Negash (2006) consists of the following components: (I) Curriculum, Textbooks Assessment, Examinations and Inspection; (II) Teacher Development Program (TDP); (III) School Improvement Plan (SIP), including school grants; (IV) Management and Capacity Building, including EMIS; (v) improving the Quality of Learning and Teaching through the use of Information and Communications Technology (ICT); and (VI) Program Coordination, Monitoring and Evaluation, and Communication.

As indicated in EFA Review Report (2015), the program receives funding of almost USD 1 billion over the eight years, two phases; of its implementation (this includes a significant government contribution). It is supporting improvements in the learning conditions and quality inputs and processes from kindergarten to grade twelve, though, among other things: developing a national ICT infrastructure improvement plan for general education through strengthening the specification, procurement, distribution and management of ICT in secondary education.

The issue of quality education has been explored using teachers' qualification, pupils-teacher ratio, learning achievements of students, level of educational facilities, and level of educational expenditure as the typical indicators of quality education.

In summary, the above discussions reveal the realities and challenging conditions of the education sector's effort towards education quality. The discussion indicated also the education sector's commitment that includes the allocation of huge amount of fund USD 1 billion (23 billion birr) for achieving education quality through systematic approach.

### **2.4.3 Ethiopian ICT for Education and the SchoolNet Program**

There is a common belief that ICTs have significant contributions to changes in learning and teaching practices, school change and innovations, and community services. Thus, Kozma (2005) advises that education policy makers should think in terms of input factors that can work

together to observe the right impact of ICT in education. Matching the facilitation of computers with national ICT policies and programs related to changes in curriculum, pedagogy, assessment, and teacher training is more likely to result in greater learning of students and other out comes (Kozma, 2005).

The Ethiopian Education Sector Development Program III (ESDP III) discusses that ICT infrastructures are provided to schools to receive satellite education transmission to enhance the quality of education at secondary level. Moreover, with the objective of improving the quality of education and supporting teachers, the process has started to make use of SchoolNet service for the 161 preparatory schools, grade 11-12 (MoE, 2005).

As stated in the document, ESDP III, the objective of the SchoolNet program is to support the country's education system with ICT. This involves providing personal computers to schools to set-up internet laboratories, organizing training for teachers, digitization of existing video-based educational contents for web access and eventually facilitating community access to ICT. In addition to enhancing the quality of educational delivery in the schools, the Internet facility provided through the SchoolNet project would enable teachers to develop their professional qualifications. It would also allow students to access the Internet and other online resources as well as to access global knowledge services and also display and download the content broadcast through the satellite television from Center for Educational Information and Communication Technology (CEICT) to their Local Area Network (LAN).

This is to mean that the national e-education initiative (the SchoolNet) has been in place to improve the 'quality' of secondary education by using ICT. In line with this, Hare (2007) mentions that Ethiopia sets ICT for education policy and implementation plan to become a model ICT user on the continent. In the same way, Firth (2005) explains that the country has been trying its best by developing curricula for ICT and facilitating with technologies like computers, internet, satellite TV so as to make every individual knowledgeable and skillful in applying ICT in his/her day-to-day activities.

In line with the aim of the Ethiopian ICT in education policy, Hare (2007) said that it is aimed to ensure ICT as an integral part of education and training at all levels. The policy indicates what the country intends to do with information communication technologies in educational settings.

It is formulated by the Federal Government and has a national wide application. The wider Ethiopian national e-learning initiative which extends from the country's ICT for education is the plasma TV program (FDRE, 2004). The implementation action plan which extends from the country's plasma TV program provides how the televise lessons are utilized. This document includes the plasma-based instruction implementation strategies and the roles of the practitioners (EMA, 2006). It extends from program formulation to incorporation and performance at the school level.

As mentioned, the plasma TV program in Ethiopian saw educational television being delivered to governmental secondary schools in the country through a closed-circuit system using Very Small Aperture Terminal (VSAT) satellite dish. This system provided a narrowcast facility that extended across the country. The signals were broadcast from CEICT which is found in the center of the country, Addis Ababa.

In the televised program, it is expected that Center for Educational Information and Communication Technology is the key implementing organization of the program. It is responsible for designing, preparing and transmitting televised programs throughout the country. Moreover, others associate organizations and community partners like the regional, zonal (sub-city)/*woreda (kebele)* educational experts are assumed to collaborate with CEICT in developing, supervising and monitoring the implementation of the program. Classroom teachers, students, and school directors are also responsible for utilizing the program. That is, the plasma TV is organized around lessons presented by a plasma teacher, facilitated/ supported by the classroom teacher, and performed by students.

The above discussion illustrates the national e-education initiative (the SchoolNet) and its designed contribution for achieving quality education. Ethiopian ICT for education policy and implementation plan is also said to be a model ICT user on the continent which is supported by developing curricula for ICT and facilitating with technologies like computers, internet, satellite TV so as to make the education system effective.

#### **2.4.4 Satellite TV Teaching and Learning in Ethiopia**

As indicated above, the Ethiopian ICT in education policy aims at ensuring ICT as an integral part of education and training at all levels. The policy indicates what the country intends to do with information communication technologies in educational settings. It is formulated by the

Federal Government and has a national wide application. The wider Ethiopian national e-learning initiative which extends from the country's ICT in education is the plasma TV program (FDRE, 2004). The implementation action plan which extends from the country's plasma TV program provides how the televise lessons are utilized. This document includes the plasma-based instruction implementation strategies and the roles of the practitioners (EMA, 2006). It extends from program formulation to incorporation and performance at the school level.

The plasma TV program in Ethiopian helped to deliver instructional TV education to governmental secondary schools in the country through the system that provides a narrowcast facility that is extended across the country. The program is expected to transmit uniform education to many students to have access to model and competent teachers, provide standardized education to all high schools, present abstract concepts in a simplified manner, and overcome the problem of qualified teacher (FDRE, 2004).

According to Sharma (et al 1994) satellite has the power to one-way transmission of data, voice, motion, video and other messages. Due to this, it enables the learners to see and hear what is transmitted for them at the times including the TV-teacher. Sometimes when mistakes are made by TV-teacher and when classroom teacher tries to correct that, the students get confused to accept the correct one. Also the TV-teacher neither sees students nor their responses to questions (Sharma et al.; 1994). Accordingly, where there is no informative feedback, there may not be effective control. The TV-teacher suffers from the disadvantage of not knowing the reaction of his/her audience.

Sharma (1994) explains that satellite TV can provide wide spread educational services to rural areas much more quickly than could be done by expanding a terrestrial microwave system. Besides, satellite technology is capable of reaching a large number of students over an extensive geographical area Laundon (1994) suggested that using combination of media for teaching and learning is most effective but the variation in learning depends on how a medium is used. This is to mean that the selection of one medium is the matter for effectiveness of broadcasting on designed lesson and the students' interaction with it because merely passive listening or viewing does not lead to learning.

Besides, there is a relationship between the student's interest in TV learning and the classroom teachers. Some scholars suggested that there was a close relationship among a particular curriculum, the classroom teacher and the children's interest in the TV-program, Schuller (1995). The Negative attitudes and inability to use TV by classroom teacher arises from various factors such as uncritical acceptance of many academic attitudes toward the television medium and lack awareness about the opportunities which TV offers educational contribution in classroom (Steinberg, 1968). Through effective utilization of the available programs, the teacher can make the lesson more meaningful which may easily understandable for all students. Research findings showed that teachers' acceptance is necessary for the effective use of instructional technology (Barnes 1965). However, to make the teaching learning more effective, the student's attitude and interest is very important. In relation to this, Callahan & Clark (1982) said success of the teaching learning process depends largely on how it fitted to the students' abilities, needs, aptitude, interest and goals. Students who are well motivated to learn usually do learn if lessons are reasonably well designed. On the other hand, if students' attitude towards school and school learning were antagonistic, teachers' effort alone did not likely to be fruitful (Ibid: 128).

As Berhanu (2013) indicated, it was in 2004 that the plasma-based instruction was launched throughout the country in the aforementioned 6 subjects. Later in 2006, three other school subjects (technical drawing, general business and economics) were also added for preparatory students. All programs have only been delivered to governmental secondary schools in the country through a closed- circuit system using very small aperture terminal (VSAT) satellite dish. This system provided a narrowcast facility that extended across the country. The signals were broadcast from EMA which is found in center of the country, Addis Ababa.

However, interruption of transmission has been observed several times. In relation to this, Berhanu (2013) said "although six subjects have been selected to be aired via satellite (plasma display panel) from the beginning, the transmission of English language and Civics and Ethical Education has been interrupted since September 2009. The transmission of other subjects with the exception of three subjects (technical drawing, general business and economics) was also terminated in September 2010. It is said that the reason for the termination of the plasma program was to improve the problems encountered during the implementation and to produce the plasma lessons in a better way. Then after, the plasma-based instruction has resumed since September 2011 in 6 subjects". Recently, except Amharic, History and Sport subjects, Television

educational programs have been broadcast in ten subjects in secondary and preparatory schools across the nation.

By putting in consideration the above mentioned points; the research will analyze the challenges of satellite TV transmission.

As indicated above the guides needs to be followed strictly and collaboration between plasma TV teacher and class room teacher should be enhanced for effective implementation of plasma education program. In consideration of this, the research also reviews the success and challenges of the plasma mode instruction on chapter four through the deployed data collection tool.

## 2.5 Conceptual Model for analyzing the implementation process of plasma mode of education in secondary schools of Addis Ababa

Referring to Chen (2005) Berhanu (2013) suggested that the conceptual framework for program theory should make clear how components of the action model are interrelated in order to activate the transformation process of the change model. Chen (2005) says a program starts with the acquisition of resources from the environment which provides the program with necessary resources and support (in other words, its inputs), and the development of an action model.

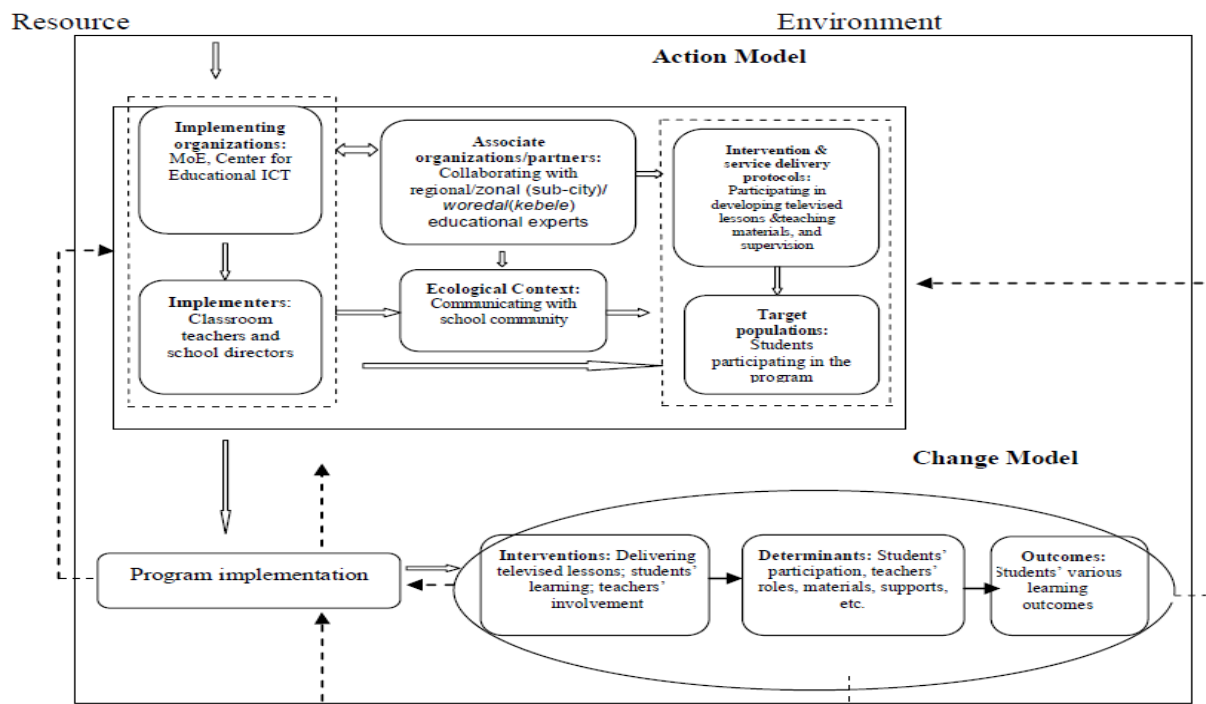


Figure 1: Program theory of the plasma TV instruction (adapted from Chen, 2005:31)

The action model can be implemented in order to activate the change model. It is the operation of the change model that leads to the attainment of program goals. Whatever effect the program has on the outcomes is not due to the implementation of intervention alone, but to a joint effect of the implementation of intervention and the implementation of other factors in the action model. The program theory of the plasma TV instruction is summarized in Figure 1 below, using Chen's (2005: 31) model.

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## **Chapter Three: Research Methodology and Procedure**

### **3.1 Introduction**

This research seeks to study the root causes of challenges of ICT policy implementation towards satellite TV (plasma) in terms of bringing quality education. The study also gives particular focus on the implementation process of ICT policy in education in terms of consistency and management of the satellite TV broadcast in some selected secondary schools of Addis Ababa. In the researcher's attempt to analyse the extent to which secondary schools in Addis Ababa are effectively implementing ICT in education policy through the plasma mode education, the researcher chosen to employ the mixed methods approach which converges or merges qualitative and quantitative research methods. In this research, the researcher adopts Johnson, Onwuegbuzie's and Turner's (2007) definition of mixed methods which considered the most complete:

*Mixed methods research is the class of research where the researcher mixes and combines quantitative and qualitative research techniques, methods, approaches, concepts or language into a single study or set of related studies*

Consequently, what the researcher set out to accomplish in this chapter is to describe and discuss the research design and procedure adopted in the study as part of an attempt to generate empirical data. In doing so, The researcher particularly focused and covered the following subtopics: Research Design and Procedure, Mixed Methods research, Philosophy in mixed methods research, Mixed Methods Research and Theories, Reasons for using mixed methods, Qualitative Research and Its Evidence, Characteristics of Qualitative Research, Quantitative Research and Its Evidence, Characteristics of quantitative research and its evidence, Combination of quantitative and qualitative data, Sample Size and Sampling Techniques, Data sources and Data collection Techniques

### **3.2 Research Design and Procedure**

As it is stated in the introductory part of this chapter, the researcher has chosen to use the mixed method in order to effectively analyze the actual challenges of the ICT use in educational policy and implementation strategy (2006) in terms of plasma TV mode education. The researcher deployed the qualitative methods in order to understand the experiences and justification of the policy making and implementing bodies of the education sector, particularly at the Federal

Ministry of Education, Center for Educational Information and Communication Technology and the Addis Ababa Education Bureau(key policy making and implementing organizations of the program). These methods allow the researcher to answer questions about the ‘what’, ‘how’ or ‘why’ of the ICT in education policy and implementation strategy and its implementation platforms. In order to explore the challenges of the implementation process and how much the implementers are dedicated to the implementation strategy, the research has deployed the quantitative methods.

To address the research questions and achieve the objectives, The researcher employed the following data collection tools: the individual in-depth interview with the developers and implementers of the policy, self-completion questionnaire with students, and analysis of official documents such as Program Action Plan (2015) of the Federal Ministry of Education, ICT in Education Implementation Strategy and Action Plan of the 2006 and Education and Training Policy (1994).

### **3.2.1 Mixed Methods Research**

Many definitions of mixed methods are available in the literature. In addition to the definition given by Johnson, Onwuegbuzie, & Collins, (2009), Creswell (2007) also defined Mixed Methods as a research approach or methodology which the researcher used as an additional definition for this study:

*Focusing on research questions that call for real-life contextual understandings, multi-level perspectives and cultural influences; employing rigorous quantitative research assessing magnitude and frequency of constructs and rigorous qualitative research exploring the meaning and understanding of constructs; utilizing multiple methods.*

In the same way, focusing on the research questions, the researcher has used mixed method to understand the context of the implementation process. Not only that, the application of the combination of the two (qualitative and quantitative) is also part of framing the investigation within the theoretical positions that the researcher has adopted for this particular study. This study focuses on individual students as end users of the program, particularly in relation to the effectiveness of the program. Therefore, this study also consults Explanatory Theory that allows describing factors and understanding why the problem exists. Depending on this and application of the mixed method, gained data on factors influencing the implementation will be systematically analysed.

### **3.2.2 Reasons for using mixed methods**

Several purposes captured the major reasons for using mixed methods in education policy implementation research. However, as Teddlie and Tashakkori (2009) it is to view problems from multiple perspectives so as to enhance and enrich the meaning of a singular perspective. It is also for the reason that to contextualize the information, to take a macro picture of a system and add in information about individuals who are part of the issue.

Another reason is to merge quantitative and qualitative data to develop a more complete understanding of a problem; to develop a complementary picture; to compare, validate, or triangulate results; to provide illustrations of context for trends, or to examine processes/experiences along with outcomes (Plano 2010).

This study used a mixed triangulation strategy with qualitative priority and emphasis, which the researcher believed can effectively answer the research questions, stated under chapter one as a research question. Mixed triangulation strategy as a strategy with two data collection phases and priority is usually equally given to quantitative and qualitative components of the research (Creswell 2009). For the purpose of addressing the research questions and achieve the objectives, the researcher employed the following data collection tools: the individual in-depth interview with the developers and implementers of the policy, self-completion questionnaire with students, and analysis of official documents such as Program Action Plan (2015) of the Federal Ministry of Education, ICT in Education Implementation Strategy and Action Plan of the 2006 and Education and Training Policy (1994).

### **3.3 Sample Size and Sampling Techniques**

The population of the study is grouped in to secondary school students, teachers, school directors, officials from the Addis Ababa City Administration Education Bureau, and Center for Educational Information and Communication Technology. Based on this, the survey is carried on three hierarchical levels. In the first level, officials from the Addis Ababa City Administration Education Bureau and Center for Educational Information and Communication Technology are addressed as policy makers, as they are part of the policy making process. In level two, school directors and teachers will be assessed as implementers. Students will be in the third hierarchical level as the end users. At the Addis Ababa Educational Bureau there are 10 experts which are directly involved in the policy designing and evaluation from which 40% of them (four experts)

are selected purposively. Purposive sampling technique is deployed at the policy maker's level, because these experts are policy and program led experts and major policy evaluation roles are mandated for to them. This is done because it enables the researcher to get more information on the background of the policy making process (ICT in Education Implementation Strategy and Action Plan of the 2006), how well the implementation process is managed and implemented.

In the Addis Ababa City Administration there are 10 sub cities out of which 3 (30%) sub cities (Gulele, Arada and Kolfe Keraniyo) were purposely selected. This is done because it is in these sub cities that significant numbers of schools are located among schools in Addis Ababa. This in turn provides a chance to get bigger picture or more data on the topic. In the selected sub cities, the number of schools are 22 and from which 6 schools, two from each sub city are selected by purposive sampling, because these schools are the major data sources of this study. The selected 6 schools that are indicated in Table 2 below have a total of 226 classes. On the average each class have 47 students that gives a total of 10,993. From these numbers of students, 105 students are selected to answer the questionnaires. This gives all students equal chance of selection. Total number of schools directors/principals and teachers that are going to be covered in this study are 12 school directors (two from each school) and 12 (two from each) teachers from the selected 6 schools. Among the school principals, the deputy principals are purposely selected because they are in charge of the entire academic process. School directors and teachers are also chosen randomly from the selected schools; school directors and teachers were selected and approached since they are policy implementers at the school level. This sampling can be seen as follow:

### **3.4 Data collection Technique**

As mentioned earlier, this study conducted using both qualitative and quantitative data collection technique. In order to present a wide range of data, both primary and secondary data sources are used in the study. Primary data was collected by using both qualitative and quantitative data collection method such as, questionnaires, in-depth and semi-structured interviews. Both techniques enable the researcher to present numerical as well as qualitative in-depth information. In order to select respondents, both random and purposive sampling techniques are used. Meanwhile, secondary data was gathered from different documents indicated in the document review section below.

**Table 1: Sampling Population and Sampling Techniques/policy makers**

Sampling Population and Sampling Techniques/policy makers

No	Institution	Experts/Officials	
		N	S
1	Addis Ababa City Administration Education Bureau	10	3
2	Center for Educational Information and Communication Technology	8	2

N= Total population S= Sampled population

Source: Addis Ababa Education Bureau

**Table 2: Sampling Population and Sampling Techniques /policy implementers and end users**

Sampling Population and Sampling Techniques /policy implementers and end users

Sub cities	Schools	Principals &D/Principals		Teachers		Students	
		N	S	N	S	N	S
Gulele	Yekatit 12 Preparatory School	4	2	81	2	1,620	16
	Medhanealem preparatory School	4	2	90	2	1,804	18
Arada	Kelemework Secondary and Preparatory School	4	2	80	2	1,179	11
	Betelehem Secondary School	4	2	60	2	1,140	11
Kolfe Keraniyo	Ayer Tena Secondary & Preparatory School	4	2	151	2	3,100	31
	Asko Secondary School	4	2	116	2	2175	21
Total		24	12	552	12	10993	108

N= Total population S= Sampled population

Source: Addis Ababa Education Bureau

### 3.4.1 Interview

Semi- structured interview was conducted with three officials of the Addis Ababa Educational Bureau of IT department who has direct involvement to plasma mode instruction. Due to lack of willingness to be recorded, the interview was conducted through note taking that took 15 minutes each. The other interview was conducted with high officials of the Center for Educational Information and Communication Technology. This also took place through note taking. Each interview has taken twenty minutes and the appointment was scheduled one week earlier. The interview with schools directors and deputy directors, who has directly involvement in the implementation process of the plasma education, was also conducted in the selected six schools. The interview was conducted in the office of directors of the schools for 20 minutes each. The other respondents were 12 teachers, who were selected randomly by school deputy directors. This interview was conducted in the director's office and assigned class rooms.

This enables the researcher to get more information on the background of the policy, how well the policy and the policy implementation strategy implemented in the Addis Ababa City Administration and to know the actual challenges of the implementation process. The interview time and place were selected based on the willingness of the interview participants.

### **3.4.2 Questionnaires**

The questionnaires were designed in semi-structured manner which includes both open-ended and closed ended questions. This helps to gather information both qualitative and quantitative data. Within the selected 6 schools, 108 questionnaires were distributed to students (1% of total population each school). The researcher used simple random sampling technique for students by using lottery method to avoid bias in the population. This helps the research to reach quite considerable number of respondents. Each student's questionnaire has questions which contained three parts, the first part with personal information, the second part consists Student's respondents towards interest and attitude of plasma education and the third part focusing on insights of Students response towards teachers support and the fourth part dealt with student's response towards plasma TV transmission. And the last part was left open ended to answer other issues which was not mentioned above in the questionnaire the questionnaire was filled on the spot and it helped to the researcher to collect out of 108 questionnaire all 108 (100%) were filled and returned the questionnaire successfully.

### **3.4.3 Document Review**

Program Action Plan (2015) of the Federal Ministry of Education, ICT in Education Implementation Strategy and Action Plan of the 2006 and Education and Training Policy (1994), Ethiopian National Education for All 2015 Review Report, statistical and unpublished documents from Federal Ministry of Education and UNESCO that are related to plasma education and quality of education are reviewed to see the findings and to compare with the results of the collected data in order to identify grey areas that need an intervention.

## **3.5 Data Analysis**

The data obtained from using different data collection instruments, the Data were analyzed using quantitative and qualitative methods. Primary and secondary sources were processed, classified and tabulated using computer software. Descriptive method was employed to analyze the data and interpret the results in quantitative and qualitative ways. Data was analyzed using different

forms as tables, figures and graphs. In dealing with the qualitative analysis based on the evidence collected from the different sources, an effort was made to carefully understand and interpret the information to use it together with the quantitative data analyzed response on open ended questionnaire and semi-structured interview.

### **3.6 Ethical consideration**

According to Vanderstoep and Johnston, (2009:12) research ethics deals with how someone treats those who participate in our studies and how he/she handles the data after he/she collected. Ethical considerations are very important for every research or study. Interviewees were informed that this work is purely for academic purposes and not for other reasons. Therefore, respondents of this study were assured of confidentiality in respect of all information that they provided. As they were not volunteers to be recorded, to assure them further, recording devices were not used in order to give respondents/ interviewees the confidence to speak all thing what they know about the issue. In every case, names are kept confidential thus collective names like 'the respondents was used in the study. All documents used have also been properly acknowledged and documented to avoid issues of plagiarism

## Chapter Four: Data Presentation and Analysis

In this section of the study, the data obtained from interview of policy makers and implementers (school directors and teachers) were analyzed and described qualitatively in narrative form in addition to my own reflective. Data obtained from the questionnaires of students were analyzed quantitatively by using percentages as a statistical method, whereas those data obtained through document analysis and open-ended questions found in questionnaire part were analyzed and described quantitatively.

### 4.1 Demographic characteristics of respondents of AAEB AND CEICT

**Table 3: Demographic characteristics of policy maker respondent**

#### Demographic characteristics of policy maker respondent

Sex	Age		Level of education			Years of service					
	No	%	No	%	No	%	No	%			
Male	5	100	25-35	0	0	Diploma	0	0	1-5	0	0
Female	0	0	36-45	1	20	BA/BSC	2	40	6-10	1	20
			46-55	3	60	MA	2	40	11-15	1	20
			Above 55	1	20	PHD	1	20	Above 15	3	60
Total	5	100		5	100		5	100		5	100

As shown on the above table, five of them (100%) of the Policy makers are males, unfortunately there are no female respondents. This indicates that the numbers of female policy makers have less opportunity. Regarding age, one group (20%) of policy maker is between the age group of 36-45, three groups (60%) of policy maker respondents are between the age group of 46-55 while one group (20%) of policy maker respondent is above 55. This implies that most of the policy makers are middle aged who are experienced and able to contribute for effective policy implementation. But, it doesn't mean that only being a middle age by itself guarantees for effectiveness of the policy, rather requires dedication and commitment.

Concerning the respondents' qualification, two (40%) policy maker respondents are first degree holders, the same two (40%) policy maker respondents are master's degree holders and one (20%) is PhD. There were no diploma and other qualification holders in the CT Department of

Ministry of Education (MoE) and the Addis Ababa Education Bureau who is responsible as a policy maker.

In relation to policy maker's efficiency and capability, Cooper, Fusarelli, & Randall (2004) said that policymakers must have sufficient knowledge, experience, time, and resources. The establishment of standards, aligning the curriculum, and assessing the outcomes, is three mutually dependent, valuable policy efforts. The practice of recognizing what to teach, how to teach it, and to what degree of capability is applicable to all subjects and all government levels generates one of the least understood and central elements of education policy (Cooper, Fusarelli & Randall, 2004; Fuller, Wright, Gesicki, & Kang, 2007; Lingenfelter, 2003). Accordingly 60% of the policy maker respondents have work experience of above 15 years which is believed to bring significant effect on formulation and implementation of policy.

## **4.2 Challenges related to educational infrastructures for the managements of satellite TV in Secondary Schools**

### **4.2.1 Teachers unwillingness related to educational infrastructures for the managements of satellite TV in Secondary Schools**

As the main challenges of policy implementation, respondents indicated that majority of teachers are not willing to give a lesson through plasma teaching mode. Though it is a well-known fact, respondents said, schools do not want to take an action on teachers who are not willing to teach through plasma.

### **4.2.2 Lack of collaboration from other government bodies**

The other challenge mentioned by the ICT Department of the MoE was lack of collaboration from other governmental service providers like the Ethiopian Electric Utility and Ethio-Telecom. Respondents said that these government service providers are not that collaborative for power installation and Internet service provision, which affects the efficiency of plasma mode education.

### **4.2.3 High staff turnover**

The other challenges mentioned by respondents were high staff turnover. In addition to inappropriate staff allocation, employees are frequently leaving the department for the dissatisfaction of salary and benefit. Equivalent to high turnover, lack of availability of skilled/competent manpower in the market is also hampering the support service of the bureau to schools in AAEB. Participants of this study reported that the bureau is hiring graduates of other discipline for the IT department to deploy them after attending on the job training programs.

#### 4.2.4 Lack of skilled man power

The other challenge in place is unsuitable staff allocation at the ICT department of the Addis Ababa Education Bureau (AAEB). Respondents said that during the policy formulation the task at the educational bureau were underestimated, as a result few staff members (12) are allocated to provide support for all (63) secondary schools in Addis Ababa secondary schools.

In each secondary school at Addis Ababa on average they have 33 class rooms, it is only one technician assigned to handle technical hassles of plasma TV. Practically one technician cannot able to support all class rooms and there is no additional in-house capacity that helps the technician. As a result, students are missing live transmission.

#### 4.3 Demographic characteristics of policy implementers (directors)

**Table 4: Demographic characteristics of policy implementers (director’s respondents)**

##### Demographic characteristics of policy implementers (director’s respondents)

Sex	Age		Level of education			Years of service					
	No	%	No	%	No	%	No	%			
Male	10	83	25-35	2	17	Diploma	0	0	1-5	0	0
Female	2	17	36-45	7	58	BA/BSC	2	17	6-10	4	33
			46-55	2	17	MA	10	83	11-15	6	50
			Above 55	1	8	PHD	0	0	Above 15	2	17
Total	12	100		12	100		12	100		12	100

As shown in the above table, ten (out of 12), (83%) of the policy implementers/directors are males, only two (out of twelve) are female respondents. This indicates that the numbers of female policy implementers are fewer. Regarding age, two (17%) of respondents are between the age group of 25-35, seven (58%) policy implementer respondents are between the age group of 36-45 while two (17%) policy implementer respondent are between the age group of 46-55 and only one is above 55(8%). This implies that most of the policy implementers are middle age and they are experienced that can achieve better results in the implementation process. Accordingly the respondents’ qualification, two (17%) policy implementers respondents/directors are first degree holders and ten (83%) policy implementers/directors of the school are master’s degree holders. It implies that they are educated and able to administer the school and the plasma mode education. There were no diploma and other qualification holders in schools who are assigned as school principal.

## **4.4 Challenges in relation to in utilization of plasma TV in education service delivery**

### **4.4.1 Frequent power interruption, lack of power backup and in-house capacity**

Based on the findings from school directors through interview, one of the main challenges hampers the effective implementation of plasma education is frequent power interruption. Not only that, but among the 6 schools covered in this study, it is only two Secondary Schools that have generator as a power back up. However, directors of these schools reported that generators of the two schools are not functioning with their full capacity. The power backup in one of the schools is old and it doesn't operate automatically when the power returns. The generator in one of secondary schools is not functioning due to lack of budget for purchase and supply of gas. The existing poor technological infrastructure (e.g. consistent power failures) during transmission is one of the drawbacks that make the policy goals unachievable as reported by policy implementers.

### **4.4.2 Teacher's attitude towards plasma mode education**

It is clear that there are diverse factors that affect the implementation of ICT for education policy in particular the plasma mode of education. School directors, who are participated in this study reported negative attitude of teachers towards plasma education as a big challenge. Respondents said some teachers think that plasma education diminishes student teachers interaction, so that it is not suitable for the Ethiopian education system. As a result, it is reported that some teachers don't consider the plasma education as a teaching aid. The point here is, at any circumstance, the "plasma" cannot be a substitute for a teacher in the classroom; rather it is a greater support for learning and teaching process. Nothing can substitute the live interaction between the teacher and the students as well as among the students as learning is also social in character. This fact is supported by much literature like in Brookfield (1987). Brookfield said interactions among students and between the students and teachers enhance the students' opportunity for learning to think critically in the traditional classrooms.

### **4.4.3 Language proficiency and skill related challenges**

Teacher's capacity related to English language proficiency varies from teacher to teacher. School directors reported that some of the teachers don't understand the language of the plasma teacher very well and they don't encourage students to follow the lesson. This, in addition to discouraging students towards the plasma education, highly affects the quality of education and hampers the policy implementation process.

#### **4.4.4 Teacher's subject matter knowledge**

Enhanced collaboration between the classroom and television teacher is most recommended by scholars of the education sector. To carry out effective teaching-learning in classroom through instructional television, Windham (1988) suggests that both the classroom teachers and television teachers need to work together in collaboration. Their collaboration can only be realized by using teacher's guide which serves as a vital bridge between a television teacher and class room teacher as Windham (1988). Nicholls (1983) said this goes on in the class room before, during and after the program is broadcasted. The main objective of Plasma guide is to give basic ideas to the classroom Teachers on how to use television lesson, what to do and how to do Windham (1988). However respondents indicated most teachers do not know the subject matter they are going to teach and sufficient techniques of teaching that help them to integrate plasma and classroom teaching.

#### **4.4.5 Lack of teachers knowledge on operation of the plasma**

Lack of skill on how to use the plasma TV is mentioned by school directors as a challenge. However, significant number of teacher respondents (65%) didn't take orientation on how to use plasma TV in classroom, whereas 35% teacher respondents were oriented. Among teacher respondents who didn't take training and orientation, there is significant number of fresh teachers. This indicates, one of the great obstacles that contribute to the ineffective utilization of plasma TV towards the policy implementation. It requires teachers' maximum efforts and advanced orientation.

#### **4.4.6 Lack of infrastructure**

The other challenge is lack of spare parts supply and immediate response from the Addis Ababa Education Bureau. Participants reported that due to lack of supply, even for minor spare parts such as cables several plasma TVs are stored without service. In one school due to class expansion they can't get a power from the electric power supply institution (Ethiopian Electric Utility) for one year. Still no improvement at this point.

### **4.5 Demographic characteristics of policy implementers (Teachers)**

The demographic analysis indicates that, eight (67%) of the teachers are males, whereas four (33%) are females. This indicates that the numbers of female teachers are less than that of male teachers. Regarding age, (33%) teacher respondents are between the age group of 25-35, two teachers (17%) are between the age group of 36-45 while five (42%) teacher respondents are between the age group of 46-55, whereas one (8%) teacher respondent is above 55. This implies

that most of the teachers teaching in secondary schools through plasma mode of education are young and they can reflect the existing reality concerning the plasma TV education.

#### 4.6 Demographic characteristics of students respondents

**Table 5: Demographic characteristics of end users (students)**

Sex			Age			Grade Level					
	No	%		No	%		No	%		No	%
Male	58	54	14-16	40	37	9-10	23	21	11-12	35	32
Female	50	46	17-19	55	51	9-10	20	19	11-12	30	28
			20-22	10	9						
			Above 22	3	3						
Total	108	100		108	100		43	40		65	60

As shown on the above table, 58 of them (54%) of the students are males, and female respondents are 50 (46%). This indicates that the numbers of female and male student respondents are almost equal. Regarding age, 40 (37%) students are between the age group of 14-16, 55 (50%) student respondents are between the age group of 17-19 while 10 (9%) student respondents are between the age group of 19-21 and only three students are above 21. This implies that most of high school students covered in this study is between the age group of 14-19. Out of the 108 student participants, 43 (40%) students are in grade 9-10 and 65 students (60%) are preparatory students. Out of this 35 and 30 respectively are female students.

**Table 6: Student's respondents towards interest and attitude of plasma education**

No	Items	SD		D		UD		A		SA	
		#	%	#	%	#	%	#	%	#	%
1	I am highly interested to learn from plasma TV	81	75	16	15	4	4	4	4	3	2
	I can easily understand the language of TV-teacher	95	88	0	0	0	0	8	8	5	4
2	I learn more from TV-teacher than class room teacher	76	70	22	20	4	4	5	5	1	1
3	I can take a note easily during transmission	77	71	11	10	0	0	11	10	9	9
4	The speed of the TV teacher is fair	91	84	10	9	1	1	5	5	1	1
5	Time given for each activity is sufficient	46	43	40	37	10	9	10	9	2	2

SD=strongly disagree      D=Disagree      UD=Undecided      A=Agree      SA=strongly agree

As it is shown in Table 6, 81(out of 108) respondents strongly disagree that learning from plasma TV is interesting which comprises 75%, while only 2 % strongly agree, 4% agree and 15% disagree. 88% of the student respondents strongly disagreed that they understand the language of TV- teacher easily while 4% of them showed their strong agreements. On the other hand, 8% of the student respondents agreed that they can understand the language of TV- teachers easily, while none of them were neutral. This indicates that most students couldn't understand the language of TV- teachers, while few of them can understand the language of TV-teachers. Therefore, it is difficult to say that there is meaningful teaching-learning process where there is no effective communication among TV- teacher, classroom teacher and students. Without understanding of language, it hard for students to understand the subject matter and therefore, we cannot say that plasma brings additional knowledge to students with regard to quality of education. In relation to student's preference, 70% of students prefer class room teacher than plasma teacher. The main reason as they mention on the open ended section of the questionnaire is, they don't understand the language and foreign accent that only 1% strongly agree that they prefer TV teacher. The other two responses are insignificant for the total population that only 4% and 5% responses are undecided and agreed.

The other point that students asked was concerns note taking during the presentation of plasma teacher. According to student respondents, one of the great difficulties they encountered while learning though plasma TV is taking note easily. To show this, 71% and 10% of the student respondents showed their strong disagreement plus disagreement respectively to the statement which is referred as "I take note easily during a transmission", whereas 10% and 9% indicated their agreement and strong agreement respectively. Consequently, majority of the students confirmed that taking note during transmission is difficult. On the Contrary, few of them said that taking note is easy. On the other hand, 43% and 37% of the student respondents revealed their strong disagreement and agreement to the statement says, for each activity time given is sufficient while 9% and 2% of them showed their agreement and strong agreement respectively and 9% of them are undecided, they play in between. From this, it is clear that the time given for each activity is not adequate.

**Table 7: Students response towards teachers support**

No	Items	SD		D		UD		A		SA	
		#	%	#	%	#	%	#	%	#	%
1	During transmission teachers help me by expanding unclear ideas	69	64	30	28	0	0	6	6	3	2
2	Teachers always encourage me to attend the lesson through plasma education	71	66	29	26	0	0	8	8	0	0
3	Teachers write some formulas on the black board	77	71	11	10	0	0	11	10	9	9
4	Teacher use different type of teaching methods to address my interest	82	75	10	9	6	6	5	5	5	5

SD=Strongly disagree      D=Disagree      UD=Undecided      A=Agree      SA=Strongly agree

As it can be seen above (Table 7), the first question focuses on teachers support during transmission through expanding unclear ideas, 64% of respondents replied strongly disagrees and 20% disagree, 6% agree and 2% strongly agree. At any circumstance, students come to school to learn what they don't know previously as well as to enhance their previous knowledge. However, the data collected from the majority of student responds make a contradiction with the stated idea that, unclear ideas were not explained by classroom teachers at least to the expected standard. Through effective utilization of the available programs, the teacher can make the lesson more meaningful by explaining unclear ideas for the students Steinberg (1968). This is to mean that the teachers are expected to use their maximum efforts to make the lesson more meaningful and understandable for their students.

The other point which was mentioned in the questionnaire is extension of teacher's encouragement towards student's attendance of plasma lesson. 66% and 26% of the student respondents indicated their strong disagreement and disagreement respectively to the question which was extended as ``teachers always encourage me to attend the lesson through plasma education`` whereas only 8% agree. From this, one can learn that most teachers didn't motivate and encourage their students to follow the plasma lesson attentively. It is known that motivation is an engine tool to draw the students' attention towards the lesson.

Writing important points like formulas by teachers was the other point assessed through questionnaire. 77 students, that accounts 71% strong disagreement that the teachers didn't write

some important formulas on the blackboard and 11% of the students also showed their disagreements, whereas 10% of them showed their agreements plus strong agreements of 9 %. According to the response, most teachers didn't write some important formulas which were very important and half ways to teaching. In the implementation of plasma TV education and bringing quality of education, teachers are main actors. However, most of them imposed all responsibilities on the plasma teacher, as students said "they forget their own roles".

On the other hand, 75% of the students strongly disagreed the idea which says that teachers use different teaching methods to address their interest while 9% of them showed their disagreement. Contrary, 5% of the student respondents agreed that teachers use different teaching methods to address the learner's interest while 5% of them strongly agreed. From the indicated data, one can say that majority of secondary school teachers don't support students through using different teaching methods to address the needs of individual learners but very few of them do. The idea of teachers support using several teaching method is also indorsed by Geoff (2004). Geoff said that the students learnt better when the teachers use different teaching methods that benefit all learners with different backgrounds. In fact, it is difficult to criticize teachers not to use different teaching methods due to plasma pressure. This means, the classroom teachers were forced to do what they were told to do by plasma teachers instead.

**Table 8: Students response towards teachers support**

No	Items	SD		D		UD		A		SA	
		#	%	#	%	#	%	#	%	#	%
1	The plasma television in my class room works regularly	43	40	38	35	13	12	9	8	5	5
2	Teachers properly operate the plasma TV if any failure happens during transmission	42	39	32	30	0	0	22	20	12	11
3	Teachers give me lecture during power interruption	11	10	15	14	15	14	38	35	29	27
4	I spend majority of my instructional time listening to the plasma transmission without making any interaction	0	0	9	9	11	10	40	37	48	44
5	Sometimes the transmission doesn't match with the text	27	25	32	29	13	12	31	29	5	5

SD=Strongly disagree      D=Disagree      UD=Undecided      A=Agree      SA=Strongly agree

In relation to regular service of the plasma TV, as indicated above (Table 8), 40% of the student respondents strongly disagreed that the plasma TV in their class room works regularly while 35 % of them showed their disagreements. On the other hand, 8% of the student respondents agreed and 5% of the respondents strongly agree the plasma TV never faced any problem. In the open ended questions, some student explained that “though plasma works, we purposely dysfunction the plasma TV. Sometimes we turn off power from the breaker and inform teachers that there is no power”. Students added that “there are some students that steal the cable and other accessories of the plasma TV; in this case the plasma doesn’t work”. From this opinion one can learn that some teachers neglect their responsibility of teaching during the plasma TV interruption. After years of plasma TV implementation, significant number of students (39%) strongly disagree that there are still teachers who are unable to operate plasma TV and 30% disagreed respectively. While, 20% agreed and 11% strongly agree respectively.

The issue of teacher’s lectures during plasma TV interruption also checked by students; from question number three indicated in Table 6. 10% students strongly disagreed for the question which says teachers give me lectures during power interruption while 14% of them showed their disagreement. Dissimilar to that, 35% of the student respondents agreed that teachers give lectures during power interruption while 27% of them strongly agreed. Based on this data, majority of teachers give a lecture during power interruption. The other point that is one of the great temptation encountered students respond towards satellite television transmission is student’s interaction. According to the respondents 37% and 44% their strong agreement plus agreement respectively to the statement which says I spend majority of my instructional time listening to the plasma transmission without making any interaction, whereas 9% and 0% indicated their disagreement and strong disagreement respectively. Accordingly, majority of the students spend their time by listening the TV teacher which results boring.

The last question was about how transmission lessons and the texts are matching. Equal percentages were given on agreed and disagreed, which is 29% each. It shows that it happened only in some subjects.

## **4.7 The challenges on the role of Plasma/Satellite TV in Improving Education Quality**

As clearly discussed in chapter two, ICTs are influencing all aspects of life, they are making dynamic changes in society. The influences are felt more and more at schools. Because ICTs provide both students and teachers with more opportunities in adapting learning and teaching from individual to a community need. In addition to this ICTs greatly facilitate the acquisition and absorption of knowledge (Tinio, 2002). According to Volman (2005) the uses of ICT is making major differences in the teaching and learning approaches of students. In line with the above discussions, interviews made with teacher respondents and analysis of student's questionnaires the herein below challenges were pointed out.

### **4.7.1 Students attitude and language skill**

Respondents of this category, teachers, said that most of students are not interested in plasma mode education. As teachers said, students are more interested in traditional kind of teaching. Regarding the contribution of plasma education towards the improvement of students' academic achievement, majority of respondent teachers said that it has positive effect on the development of the students' English language listening skills. Teachers, who agreed on the positive impact of the English language, argue that most of the students are now catching new vocabulary as a result of listening to them repeatedly from the "plasma" transmission. These participants argued that this to occur at the expense of the other learning outcomes. However, few have reservation on this as the language level is complicated to some of the students to understand. Banks and Banks (1997:272) explained that Language plays an important role on students' learning and achievements. Language, as a system of communication, is an indispensable bridge for sharing knowledge, skills, values and attitudes within and across cultures. It has tremendous power as the paramount instrument of cognitive development, and it can open or close the door to academic achievement. Besides, Rubanguma (2000) in Altaye (2001:9) clearly explains the effect of student's proficiency on the language used as a media during instruction. However teachers in this category agree that the majority of the students cannot follow and understand the lessons broadcasted through the Plasma. One of the main problems is language. Most of the students do not have the necessary English skill to listen and understand the live transmissions. It is also very fast. When we look into the above responses in depth, there are two seemingly opposite ideas from the same participants; that is, on the one hand, they said that live transmission improves the listening skills of the students; and on the other hand, they said also that the students are

spending their instructional time in listening. This finding suffices with the finding of Lemma's (2006) classroom observation that indicates the language barrier as a great challenge.

#### **4.7.2 Speed of transmission**

In addition to the language problem, the speed of the transmission was another major problem as mentioned by all respondents. Classroom observations also proved this assertion and it was supported again by Lemma (2006). A teacher in Kelemework Preparatory School said "the transmission is very fast, however, to address this issue we are being provided with the recorded version. In this version, we have over control of the transmission that we can pose it and give further explanation for students. However, still the instructional time ends without the students understanding the subject matter; it does not supply the needs and pace of the students. According to the above opinion the new initiative of Addis Ababa Education Bureau "SchoolNet" is a little bit better at least it can be replayed and posed but still the problem is there in related to time allocation.

#### **4.7.3 Teacher's endorsement on the plasma TV-teaching method**

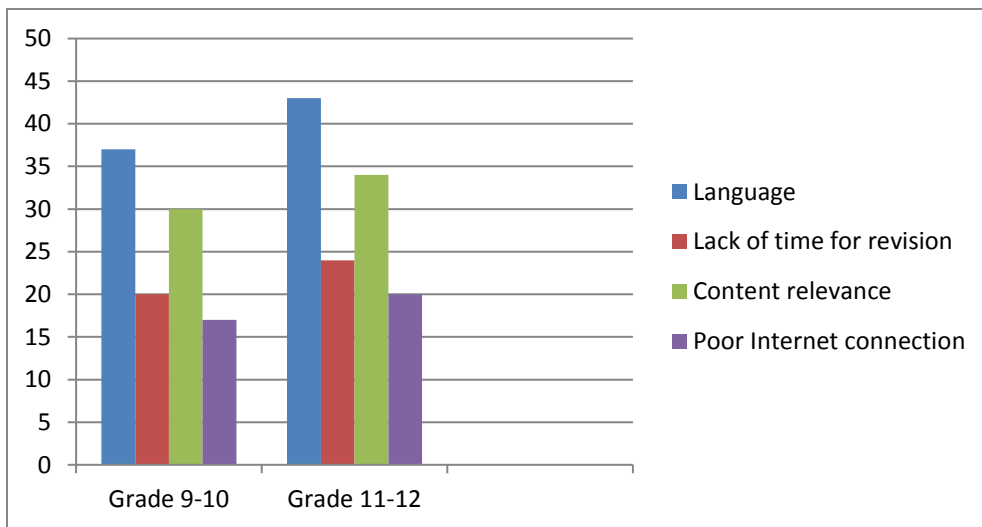
On the role of plasma TV in promoting effective teaching and active learning towards quality education, significant number of teachers (40%) showed their disagreement on the idea that plasma TV- teaching method promotes effective teaching and active learning. However, the remaining (60%) of the teacher respondents showed their agreement on plasma TV teaching method promotes active learning and effective teaching. From this, one can state that plasma TV-teaching method has not as much of significance and acceptance in promoting active learning-teaching. Teacher respondents, who showed disagreement, argued that teaching- learning through satellite TV doesn't give room for students' active involvement and their maximum mental efforts. They added, the intended educational objectives are better achieved if and only if the students' text, the teacher's guide and the plasma transmission are related.

#### **4.7.4 Other challenges**

Totally 98 students from secondary school (Grade 9-10) and preparatory school (Grade11-12) responded for open ended questions in the questionnaire about other main challenges of learning through plasma education.

As it shown below (Figure 2) and mentioned by teacher respondents as well, language is a great barrier for students learning through plasma, 37 out of 43 students (85%) in secondary school said language is a big challenge for them to understand the plasma lesson. The same is true for preparatory class students (Grade 11-12) that 47 out of 55 (86%) raised red flag on language.

Banks and Banks (1997:272) explained that Language plays an important role on students' learning and achievements. Language, as a system of communication, is an indispensable bridge for sharing knowledge, skills, values and attitudes within and across cultures. It has tremendous power as the paramount instrument of cognitive development, and it can open or close the door to academic achievement. Besides, Rubanguma (2000) in Altaye (2001:9) clearly explains the effect of student's proficiency on the language used as a media during instruction. According to Rubanguma, the more the students have a good command on the language used as a media of instruction, the more the learners have a chance to be successful in their learning progress. However, as emphasized by both teachers and students, language is a big challenge that is hampering the success of plasma mode education and education quality in the meantime.



**Figure 2: Students respond towards main problem of plasma education by category**

The other challenge which was mentioned by students was content relevance to the Ethiopian context. Among the participants of this study 30 (70%) of students of grade 9-10 and 37 out of 55, 68% of grade 11-12 said the second challenge is the irrelevance of examples towards the Ethiopian context. The other challenge indicated by students is lack of time for revision as all time is allocated to plasma education. Among students, which are preparing for national examination, 47% of secondary school students and 46% of grade 11-12 students said time allocated to plasma education has no room for revision of main points. at last but not least the challenge is connection problem which occurs during the transmission. Students said when the Internet connection is down, there are times that video or audio, sometimes both are missing.

However, Very recently AAEB has launched a new initiative of the SchoolNet program that allows teachers to have recorded lessons. This initiative that is done from the budget center of

the AAEB, (not from the budget of MoE) let teachers to pose recorded lesson and interact with their students. However, teachers are not willing and interested in utilization of this option as they are intended to avoid teaching through plasma.

# Chapter Five: Summary, Conclusions and Recommendations

## 5.1 Summary

The Government of Ethiopia (FDRE, 2004:8) presents justifications for introducing “plasma” program as “In the globalized world, information and communication technology is vital, (and hence), installation of satellite receiving devices known as plasma display panels (PDPs) in every classroom at secondary level is necessary”. In the same document (FDRE, 2004:8-9), the Government also explained specific reasons for the need of “plasma” mode of instruction as “to present abstract concepts in a simplified manner; to transmit uniform education to as many students found in different places at the same time; to enable students to have access to model and competent teachers; to demonstrate laboratory equipment found in one place (classroom) to other learning classrooms”. These objectives of the Ethiopian Government in introducing the plasma mode of instruction receive several opinions by different scholarly articles. However, it is essential to examine the current status of the plasma based classroom situations from different perspectives. Therefore the main objectives of this study is to analyze the root causes of the ICT usage challenges towards satellite TV (plasma) in terms of bringing quality education through giving particular focus on the implementation process of the policy for ICT in education. Taking this as a base, the study attempted to find answer for the following basic questions:

- To what extent the use of plasma TV improve education quality in secondary schools?
- To what extent the educational infrastructures are available for the managements of satellite TV in Secondary Schools?
- What are the main challenges in the utilization of plasma TV in education service delivery?

In order to address these basic questions, data were collected from 108 randomly selected students from six selected secondary schools of Addis Ababa through questionnaire. Data were also collected from 12 teachers and 12 school directors from the selected schools and 5 experts and officials from the Addis Ababa Education Bureau and the ICT Department of the MoE through in-depth interviews in addition to document analysis. The respondents were randomly selected by using lottery method while the participants were purposely selected on the basis of cooperativeness, experiences and competency. Consequently, from 108 students 102 students correctly filled and returned the questionnaires. As plasma TV is not implemented in private schools, only government schools got the chance to participate.

The data collected from students through questionnaires were analyzed quantitatively using percentage as statistical method, whereas the data collected through, interviews, open-ended questions and document analysis were analyzed qualitatively in a narrative form. According to respondents from the policy maker's category, majority of teachers are not willing to give a lesson through plasma mode of education. Though it is a well-known fact, respondents said, schools do not want to take an action on teachers who are not willing to teach through plasma. The other challenge indicated by respondents is unsuitable staff allocation at the ICT department of the Addis Ababa Education Bureau (AAEB). This problem is also reflected in the schools. In each school under study, there is only one technician who handles 33 classes on the average.

The same way, majority of school directors, who are participated in this study reported negative attitude of teachers towards plasma education. Respondents said some teachers think that plasma education diminishes student teachers interaction so that it is not suitable for the Ethiopian education system. As a result, it is reported that some teachers don't consider the plasma education as a proper teaching aid. The role of plasma TV in promoting effective teaching and active learning towards quality education is also questioned by significant number of teachers as well, (40%). However, the remaining (60%) of the teacher respondents showed their agreement on plasma TV teaching method promotes active learning and effective teaching.

Teacher's capacity is related to English language proficiency in understanding plasma TV teachers, lack of skill by some teachers in operating the plasma TV are challenges reported by participants. Participant school directors of this study indicated that frequent power interruption and lack of functioning power back up as a big challenge.

The other challenge mentioned by the ICT Department of the MoE was lack of collaboration from other governmental service providers like the Ethiopian Electric Utility and Etho-Telecom. Respondents said that government service providers are not that collaborative for power installation and Internet service provision, which affects the efficiency of plasma mode education. It is not only government owned service providers that are lay blame on poor collaboration and support. Schools are also blaming the AAEB for negligence in immediate IT related support, TV maintenance and equipment supply.

Due to student's enormous lack of interest on plasma mode education, students are deliberately interrupting the plasma transmission. This in turn is affecting the learning and teaching process as well as hampering quality of education.

Student participants of this study indicated that teachers did not write some important formulas and definitions on the blackboard. Also they did not motivate students to follow the lesson attentively. However, important formulas and definition of words are the core-concepts of the given lesson, and the teachers are expected to motivate the students. Most students couldn't understand the languages of TV-teachers and they faced difficulty of taking note due to uncontrolled speed of plasma TV even it is possible to pause it but not for that pace.

## **5.2 Conclusion**

The study disclosed many issues related to plasma TV education implementation and many factors that hindered effective implementation of the ICT in Education Implementation Strategy and Action Plan. The ICT in Education Policy which focuses on bringing quality education is also aimed at creating an equal opportunity for success of students on their education at the higher level and life, in general. The plasma education that is designed as an implementation tool of this policy is also aimed at promoting quality education as well producing efficient, effective and civic-minded citizens. The Ethiopian Ministry of Education has also explained specific reasons for the need of the “plasma” mode of instruction as “to present abstract concepts in a simplified manner; to transmit uniform education to many students found in different places at the same time; to enable students to have access to model and competent teachers; to demonstrate laboratory equipment found in one place (classroom) to other learning classrooms”.

However, as per the finding of this study, provision of quality education through plasma mode education is suffering from several challenges. The challenge includes education administrator's focus and commitment of implementation, lack of interest of teachers and students towards learning and teaching through plasma, lack of effective school infrastructure and supply, sufficient and well-prepared texts, well-oriented members of school community and management.

In addition to the above mentioned points, throughout the investigation of this research, the following gaps are also identified as main challenges:

## **Major conclusions**

### **I. Issues related to educational infrastructures for the managements of satellite TV in Secondary Schools**

- Lack of continues monitoring and evaluation
- Lack of skilled and sufficient man power
- Lack of spare parts, efficient maintenance, frequent power interruption, inappropriate management of plasma TV, nonfunctioning remote control and electric power breaker.
- Lack of immediate action on maintenance and support to schools
- high staff turnover
- Lack of collaboration with other government service providers such asEthio -telecom and Ethiopia Electric Utility
- Lack of monitoring and evaluation towards teachers performance
- Lack of awareness creation on the importance of plasma mode education both for teachers, students and the school community.
- Lack of regular assessment on the implementation status
- Improper plasma TV management.
- To what extent

### **II. Challenges affect the use of plasma TV to improve education quality in secondary schools**

- Lack of interest to use plasma TV as an aid of teaching material
- Less interaction with students and unwillingness to give clarification for unclear ideas, formulas and definitions.
- Lack of provision of relevant content that fits the plasma education
- Lack of interest on the entire plasma mode education.

### **III. The main challenges in the utilization of plasma TV in education service delivery**

- Lack of adequate training of teachers on how to operate the plasma
- Lack of awareness on the importance of plasma education
- Lack of language proficiency to understand plasma teacher
- Lack of time for revision

The absence of these core elements of the policy and plasma mode education has an obvious impact on the provision of quality education, which will eventually lead to differences in performance and capacity on students. And again, the main pillar of the National Education Policy (1986), which is “bringing knowledge and skills that could help citizens to be successful in their learning and thus, in their future life” seems to be compromised. Therefore, it is safe to conclude that the policy implementation towards achieving quality education through plasma mode education is not moving to the expected level.

### **5.3 Recommendation**

The researcher suggests the following major points of recommendations for effective implementation ICT in Education policy and its plasma mode education based on the data collected:

- The policy, that considers plasma transmission as the only mode of instruction needs to be revised. The plasma mode should rather be used as a supplement to a learner centered classroom so that students and teachers can make a choice in their learning.
- The transmission content and lecture should be prepared and given by local education experts so that student’s interest and understanding level will be increased.
- Awareness creation for teachers and students should be done in continuous basis.
- Adequate training must be given particularly for newly joining teachers on how to operate the plasma TV.
- In order to get uninterrupted plasma transmission, adequate and skilled manpower should be allocated both at the AAEB and schools
- Uninterrupted power supply should be provided to schools through provision of power back up and negotiation with the Ethiopian Electric Utility.
- The education bureau should retain teachers and IT professionals through the provision of benefit and incentives.
- Language proficiency is identified as a big gap both in students and teachers. Therefore, curriculum related to the media of language in primary school should be revised.
- In order to get good result in quality of education, the transmission should be available online and should be given in CD and Flash Disk to students who can afford and want to revise at home so that they can pause and replay until they understand and it should be available in CD and Flash for students who cannot afford at the IT laboratory of each school.

- More time should be given to teachers and students in the classrooms so that they can discuss on the learning materials in depth which leads to better understanding of subject matter and active learning mode.
- Adequate spare part should be kept in all schools or enough budget must be allocated for spare parts purchase at school level
- AAEB should enhance collaboration with government owned service providers so that the power interruption and Internet connection related issues can easily be resolved.
- AAEB should enhance support supervision and take immediate action when challenging issues are arising at the school level.
- Administrators follow up of teachers at the school level must be enhanced and should take an action on teachers who are not volunteer to teach through plasma
- The plasma lesson is only given in selected subject matters such as natural science subjects. This has to broaden to other subjects.
- Enough time for teachers to summarize the topic should be given in a weekly basis, one day in a week is more recommended.
- In order to avoid interruption of the plasma broadcast and stealing and cheating, remote control, the plasma TV and the breakers should be kept in locked box.

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# Appendices

## 1. Interview guide for school directors and teachers

The purpose of this interview is to collect relevant information on the implementation process of plasma mode education. It also looks in to how plasma education utilization improves education quality and its challenges in selected secondary schools of Addis Ababa. Therefore, it is to gather your opinion and experience on the issue. This information is purely used for research purpose. To this end, your honest and straight forward response is very important and would contribute highly to the success of the study.

### Part A: Demographic data

#### Age

- a) 25-35 b) 35-45 c) 45-55 d) 55 and above

#### Sex

- a) Male b) female

#### Educational background

- a) First degree b) Masters degree c) PhD

#### Years of service as a school director or teacher

- a) 1-5 years b) 5-10 years c) 10-15 years d) 15 and above

#### Title

- a) School Director b) teacher

### Part B: Main data: Questions related to the implementation process of plasma TV

#### B.1: For School Directors: institutional set-up/ frameworks for the managements of satellite TV in Secondary Schools

1. How many secondary school students do you have in a school?
2. How many plasma TVs you have in a school? Of which how many of them are functioning?
3. Who is responsible for the television management?
4. Who is responsible for maintenance when the television is not working? And in what pace you get the television repaired?

5. Do you conduct research on effective implementation of plasma education and its contribution to quality education? If “yes” what improvement did you see then?
6. How do you explain the contribution of plasma TV in improving students’ academic achievement and quality of education?
7. What do you think is the main challenge of plasma education implementation?
8. Who do you think in your school is policy implementer of the plasma mode education?
9. Do you think the satellite television transmission meet your students’ needs? If no why?
10. What are the strengths and weaknesses of the plasma mode of instruction?
11. How do you see the support you get from educational bureau in terms of effective implementation of the plasma mode education

**B.2: For Teachers:** Utilization of plasma TV towards education quality in secondary schools

12. In which grade level do you teach?
13. What subject do you teach?
14. Do you think that plasma teaching method encourages active learning method?
15. What are the problems you encountered during transmission? Why?
16. Some scholars agree that necessary training should be given to the teachers on how to use operate/ plasma. Do you get any training on how to operate the plasma television? If no why?
17. How do you describe the participation of the students and yours during transmission?
18. What do you do when the transmission is failed? What do students feel?
19. How could you explain your interest towards teaching through plasma TV? And what about the students’ interests?
20. How do you illustrate the pace and the language of transmitter?
21. How long does the television get not repaired? And what do you do when the TV is not working?
22. Who do you think the policy implementer of the plasma education?
23. Some people said teachers are passive and dissatisfied with the current mode of instruction. Do you agree with this? Why?
24. How do you compare the similarities and differences of your students’ learning between the previous learning experience that is, the face to face and plasma mode of learning?
25. Do you think the policy regarding the plasma education meets its goal?

## 2. Questionnaire to be filled by students

The purpose of this questionnaire is to collect relevant information on how does plasma education utilization improve education quality and its challenges in selected secondary schools of Addis Ababa. Therefore, it is to gather your opinion and experience on the issue. This information is purely used for research purpose.

To this end, your honest and straight forward response is very important and would contribute highly to the success of the study. Writing your name is not necessary.

Thank you in Advance

### Part A: Personal Data

1.1 Grade level \_\_\_\_\_

1.2 Sex \_\_\_\_\_

1.3 Name of the school \_\_\_\_\_

1.4. How many subjects do you learn through satellite television? \_\_\_\_\_

### Part B: Questions related to plasma mode education towards education quality

**Instruction:** Indicate the extent to which you agree on points related to plasma mode education towards education quality by putting ( ✓ ) against each item

SA = strongly agree SD = strongly disagree A = agree D = Disagree UD = undecided

#	Items	SD	D	UD	A	SA
<b>Part 1: Teachers support</b>						
1	During transmission teachers help me by expanding unclear ideas					
2	Teachers always encourage me to attend the lesson through plasma education					
3	Teachers write some formulas on the black board					
4	Teacher use different type of teaching methods to address my interest					
<b>Part 2: Students' attitude and interest towards plasma</b>						
5	I am highly interested to learn from plasma TV					
6	I can easily understand the language of TV-teacher					

7	I learn more from TV-teacher than class room teacher					
8	I can take a note easily during transmission					
9	The speed of the TV teacher is fair					
10	Time given for each activity is sufficient					
<b>Part 3: Questions related to satellite television transmission experience/facilitation</b>						
11	The plasma television in my class room works regularly					
12	Teachers properly operate the plasma TV if any failure happens during transmission					
13	Teachers give me lecture during power interruption					
14	I spend majority of my instructional time listening to the plasma transmission without making any interaction					
15	Sometimes the transmission doesn't match with the text					

Open ended questions

1. What are the most difficult problems you face during transmission?

.....  
.....

2. Which do you prefer; learning from classroom teacher or televised teacher? Why?

.....  
.....

3. Please comment if you have any other ideas about plasma teaching-learning problems in your school

.....  
.....  
.....

### **3. Interview Guide for Policy Makers**

The purpose of this interview is to collect relevant information on the implementation process of plasma mode education. It also looks in to how plasma education utilization improves education quality and its challenges in selected secondary schools of Addis Ababa. Therefore, it is to gather your opinion and experience on the issue. This information is purely used for research purpose. To this end, your honest and straight forward response is very important and would contribute highly to the success of the study.

#### **Part A: Demographic data**

##### **Age**

- b) 25-35 b) 35-45 c) 45-55 d) 55 and above

##### **Sex**

- b) Male b) female

##### **Educational background**

- b) First degree b) Masters degree c) PhD

##### **Years of service**

- 1-5 years b) 5-10 years c) 10-15 years d) 15 and above

#### **Part B: General Questions**

1. How many secondary schools found under Addis Ababa education Bureau?
2. How many of them have satellite television transmission/plasma TV?
3. How many of them haven't satellite television transmission/plasma TV? Why?
4. Is there any school that has been denied to implement the plasma education? If yes, how many are they and why?

#### **Part C: Questions related to Policy making and implementation process**

- a. During the formulation, were a number of policy options identified; if not, why and if so, how many and by whom?
- b. What influenced policy makers to adopt a particular course of action and what were the political, social and economic considerations taken into account?
- c. During the policy formulation, what interested groups, if any, have been consulted and what sources and kinds of advice have been obtained?

- d. What was the entire purpose of the implementation of ICT utilization specifically for the plasma mode education?
- e. During the development of implementation strategy, were roles assigned explicitly to key players and was a mechanism for coordination and compliance put in place?
- f. How do you evaluate plasma education institutional set-up and implementation Arrangement?
- g. How effective is the implementation of plasma education in secondary schools
- h. How do you evaluate the schools commitment in supporting plasma education implementation?
- i. What are the major problems encountered during the implementation of plasma education
- j. Do you conduct monitoring and feedback mechanism or procedure of plasma education, if yes, what are the major achievements so far?
- k. Do you think the existing relationship particularly in terms of collaboration in between policy makers, policy implementers and beneficiaries satisfactory?
- l. How do you evaluate the participation of stakeholders, in the design, implementation and evaluation of plasma education?
- m. What are the major achievements of the plasma education implementation on improving the quality education in secondary schools?
- n. Is there any option to re-examine the mandatory “plasma” transmission which is the only mode of instruction in government school.