CHAPTER ONE: INTRODUCTION

We live in a world that is rapidly evolving through high technologies. The influences of these advanced technologies have become omnipresent in almost every facet of our life, including in our educational systems. In today’s classrooms where educational technologies are successfully integrated, these technologies have been identified playing crucial roles in curriculum implementation and enhancing the teaching-learning processes (Kulik and Kulik, 1991; Yusuf, 2005; and Mhlolo, 2007; cited in Aladejana, 2008).

With the strong political commitment shown by the FDRE to use ICT in the sector of education and achieve the four frontier educational goals (quality, equity, access and relevance), Ethiopian secondary schools are currently equipped with a hi-tech instructional technology, named as Plasma TV (PTV), since 2004 and through which six subjects (Biology, Chemistry, Physics, English, Maths and, Civic and Ethical education) are broadcasted and implemented till date.

Plasma TV (PTV), which is the state-of-the-art technology, has many alluring features and provides a high quality three dimensional (3D) multimedia content, giving teachers instant access to relevant contents required for teaching, helping students visualize abstract concepts and captivating students interest with stimulating videos, animations, live images and colorful graphics which results in improved learning. PTV has a large and better screen to display multimedia. Its monitor (Plasma Display) is capable of displaying high definition TV, regular TV, and home video. Its monitor is also capable of doing everything a regular computer monitor can do. It is a time-tested fact that the proper integration of PTV into the classroom teaching-learning activities plays an important role in enhancing students’ motivation to learn, their understanding and retention of the subject matter they learn.
However, the broadcast has brought both prospects (opportunities) and challenges in education that have not been properly studied and documented. Thus, the purpose of the present study was to investigate the opportunities and challenges in integrating PTV in teaching secondary school Biology in the Eastern part of Ethiopia (Fig. 6).

1.1. Profile of the Study Area

Ethiopia is a country located in the Eastern part of Africa, usually called the Horn of Africa. Addis Ababa is its capital. Ethiopia is the world’s 27th largest country, comparable in size to Bolivia. It lies between latitudes 3° and 15°N, and longitudes 33° and 48°E (Figure1). The topographic features of Ethiopia range from a peak of 4,550 meters above sea level at Ras Dashen Mountain down to 110 meters below sea level at the Afar depression. The climate and terrain of the country is highly diversified. The two major agro-ecological zones are the high lands which constitute about 40% and the low land takes up over 60% of the land area and the country experiences both the dry and wet seasons.

Ethiopia is one of the poorest countries in the world (Asfaw, Ayele, Gebremariam and Otores, 2009; ESTA, 2006; Lasonen, et al, 2005; Tilson and Bekele, 2000). It is a Federal state with multi-ethnic, multi-cultural and multi-lingual diversity and has 11 regional states with a total area of 1,104,300 sq.kms. Its people altogether speak over 80 different languages (UNSD, 2013, Wikipedia, 2013). According to the 2011 statistics (CIA, 2011), its population is about 88 million growing at an annual rate of 3.2%. According to Lasonen, et al (2005), Ethiopia is the second most populous country in Sub-Saharan Africa after Nigeria. English is the most widely spoken foreign language and is taught in all secondary schools, and Amharic is the official (working) language (CIA, 2013). Furthermore, according to the CIA (2011) report, the country’s literacy rate was 42.7%. And the educational expenditures were estimated to be 5.5% of GDP (2005-2010) (UNSD, 2013).
Ethiopia’s poverty-stricken economy is based on agriculture, accounting for almost 50% of GDP, and 85% of total employment. The agricultural sector suffers from frequent drought and poor cultivation practices. Coffee is critical to the Ethiopian economy with exports of some $350 million in 2006 (CIA, 2012).

According to UNSD (2010), GDP per capita (in US$) was 344.6 affirming that Ethiopia is among the underprivileged countries in the globe. Furthermore, UNs (2011) report indicated that Ethiopia ranked as the 190th country (out of 209 countries in descending order) in its per capita income. According to the Global Finance (2012) report, Ethiopia was one of the world’s poorest regions based on gross domestic product (PPP) per capita 2008-2012.

Lastly, historical studies of education in Ethiopia indicate that the traditional education system of the country was religious. The first modern school in Ethiopia was opened for the public in 1908. However, the school curriculum was predominantly influenced by Western traditions (Teshome, 1979). The structure of the Ethiopian education system is $4 + 4 + 2 + 2$, i.e. 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 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 (both governmental and private) are also provided at different levels.
Figure 1. Location of Ethiopia.

(Source: Country Study by Thomas P. Ofcansky and LaVerle Berry).
1.2. Review of Related Studies

In this section, review of related studies is briefly presented. The purpose of the review was to identify the research gaps to be filled by the present study. The broader version of this section is presented in Chapter two (Review of Related Literatures). Consequently, available and related studies (both electronic and print materials) were thoroughly reviewed in relation to educational broadcast through PTV and are concisely presented below.

Meless and Teshome (2006) conducted a study on the assessment of the impact of PTV implementation on the teaching and learning process of mathematics in secondary schools in Jimma district (Western Ethiopia). The objectives of the study were to: (i). Determine the strengths and weakness of the PTV lessons; (ii). Assess factors influencing the teaching and learning process (iii). Identify advantages and problems encountered by the teachers and students due to the PTV introduction. (iv). Find out the strengths and weaknesses of the TV implementation in preparation, maximum utilization of the technology, and its methodological influence on active learning method; and (v). Assess the reaction of parents to the innovative movement. Data collected through questionnaires and observations were analyzed by using both quantitative (frequency, percentages, mean and standard deviations) and qualitative methods. The findings of the study were: (i) PTV was reported as a strong support for active learning in mathematics classes; (ii) It (PTV) was also found as an important media in assisting uniform lessons and contents; and supplementing the laboratory activities; On the other hand, implementation problems such as speedy broadcast, lack of harmony between PTV and classroom teacher, inappropriate planning of the lessons, inefficient utilization of the technology, and misconceptions (by students and teacher) about PTV were the other findings emphasized by the researchers.
Bitew (2008) carried out an evaluative study on the utilization of PTV broadcast in secondary schools in Addis Ababa, Ethiopia: ‘A Brief survey of government and Catholic secondary schools’ experiences’. The objectives of the study were to: (i). Assess the different school experiences for students in the two types of Secondary schools (Catholic and government) due to either the presence or absence of the new mode of instruction; (ii). Investigate the attitudes of students, their teachers and parents towards the PTV mode of instruction; and (iii). Suggest possible improvements in the schools’ situation for the best possible learning outcomes. Questionnaire, interviews, Observations and documentary analysis were the instruments of data collection. Qualitative (Ethnographic) approach was used to analyze the data. The major findings of the study were: (i). Students’ classroom activities and their school experiences in Government and Catholic schools were quite different. (ii). Students in the Government schools were found to be spending the majority of their instructional time listening to the PTV transmission without making any live interaction. (iii). Students were also passive and dissatisfied with the PTV mode of instruction. (iv). The major factors associated with their dissatisfaction were difficulty in understanding of PTV teacher’s English language; high speed of PTV; lack of class time for the students to discuss with their teachers and classmates. (v). Students in the Catholic school were more comfortable with their school’s mode of instruction compared to that of Government schools. Lastly, (iv). Students in the Catholic school had enough time for interaction with their teachers and classmates. Continuous and on-time feedbacks were also given to students by their teachers.

Melesse, Teshome, Simachew and Eshete (2012) studied about the status of satellite Television (PTV) broadcast programs implementation in mathematics and science subjects in Ethiopian Government high Schools from teachers’ perspectives in the South, North and central Ethiopia. The objectives of the study were to: (i). Evaluate (rate) the
quality of the PTV program content and presentation. (ii). Assess the role played by teachers during the implementation of PTV program. (iii). Investigate the extent to which learning environment (classroom interaction) is conducive for effective implementation of the satellite PTV program. (iv). Assess the possible advantages and limitations of the PTV instruction. (v). Study the potential changes that could be there related to patterns of usage of the technology among schools, teachers, and students. Mixed research design comprising qualitative and quantitative approaches was used to collect data. Descriptive statistics such as Frequency and percentage were used to analyze data. The findings of the study suggested that: (i). Most of the class interactions during the PTV lessons in all the subjects investigated under the study were found to be the very success of the PTV implementation. (ii). Lesson organization, planning, use of variety of methods for presentation supported by visual aids; content coverage and provision of selected exercises within the given schedule, providing equal access to students throughout the nation, proper utilization of the technology (size and style of fonts, color utility for relevant topics) were all the strength of PTV. (iii). On the other hand, very few elements of teaching-learning activities such as insufficient time for the school teacher involvement and students to take notes and do class exercises; and lack of opportunities for visually impaired students were weaknesses of the PTV lesson broadcast.

Gebremedhin (2008) conducted a critical evaluation on the practice of listening comprehension through PTV in grade 11 Government Secondary Schools in Ethiopia. The objectives of the study were to (i). Examine if the methods/procedures used were on the basis of pre-, while- and post listening stages or not. (ii). Identify the major factors that affected learning listening comprehension through PTV. Frequency and percentages were used to analyze data gathered through questionnaire, observation and interviews. The results of the study were: (i). Learning listening comprehension through PTV was very difficult. This was
attributed to: (a). The time given to complete the listening comprehension tasks was not adequate. (b). Unfamiliar topics and contents made listening comprehension more difficult. (c) Lack of practicing accent, proper pronunciation, stress and intonation. (d). Too long and rapid speech of the listening passage. In addition, opportunities were not given for the students to tryout their responses. (ii). Teachers were not seen in organizing students in pair/group work. (iii). The inconsistent transmission of PTV programme and the surrounding noises made listening of the spoken text difficult. In sum, as pre-college candidates, secondary school students under the study were unable to perform as much as required of them.

Haile (2008) carried out a comparative study on grammar teaching methods by employing PTV teachers and non-PTV teachers with specific reference to grade nine secondary school students in Jimma Town (Western Ethiopia). The objectives of the study were to answer the research questions related to: (i). Methods and techniques used by PTV teacher and the non-plasma school teachers to teach grammar. (ii). Procedures follow by teachers (both teachers) to teach grammar. (iii). Study differences in teaching methods. (iv). Identification of teaching method established (by PTV or non-PTV teacher or both) based on the theory of communicative grammar teaching. (v) Investigation of factors that hinder the creation of interactive grammar class. (vi). Assess the nature of tasks they prepare, and class organization they used to teach grammar. And, (v). Roles teachers play during educational broadcast through PTV. Mixed methods of data collection (questionnaires, observations and interviews) and analysis (frequency, percentages and narrations) were used. The major findings of the study indicated that PTV teacher: (i). was teaching grammar inductively at first and then deductively to explain the rules in the form of summary. (ii). was frequently incorporating techniques such as pictures, real images of people doing variety of activities (hunting, fishing, playing football),

insects, geographical sites (like desert areas) to contextualize grammar lessons. And, (iii). provided students with activities such as problem solving and information gap. (iv). was unable to understand students' background (individual differences) and the learning environment, large class size, and limited role of the classroom teachers. The investigator highlighted that these factors seriously affected the effective implementation of communicative grammar teaching by using PTV.

Belay (2008) conducted a study on the application of communicative language teaching in PTV-based English classrooms in government secondary schools in Addis Ababa, Ethiopia. The objectives of the study were to (i). Assess the nature of the activities and tasks presented by the PTV. (ii). Examine students’ and classroom teachers’ efforts in playing their role during communicative activities presented by the plasma TV. (iii). Find out the appropriateness of time allotment for doing communicative activities presented by the plasma TV. (iv). Examine the appropriateness of the classroom physical environment for doing activities and tasks presented by the PTV. And, (v). Find out other associated factors that influence the application of communicative language teaching. Interview, classroom observation checklist and FGDs were the data collecting tools used. Descriptive statistics such as frequency distributions, Percentages, and means were used to analyze data. The results of the study revealed that communicative language teaching was not properly implemented. The major factors contributing to that were: difficulty level of the activities presented by the PTV, students’ low proficiency in the English language, lack of teachers’ training in teaching English, inappropriate time allotment, poor classroom physical environment, grammar-based examinations and shortage of curricular materials.

Alemu (2003) conducted an investigative study on the content and utilization of instructional Television (ITV) programs in teaching English in secondary schools with specific reference to grade 9 in Addis Ababa.
The objectives of the study were to answer research questions related to (i). Utilization of ITV programmes by English teachers to teach grade 9 English. (ii). Extent of utilization of ITV programme (if any). (iii). Studying whether the procedures and suggestions provided in the ITV teacher’s guide for implementing ITV programs were followed by teachers or not. (iv). Finding out if English teachers received training related to the newly introduced ITV programs or not. Multiples methods of data collection (Content analysis, questionnaires and classroom observation) were employed. Data collected were analyzed using percentages, frequency and narratives. The findings of the study showed that: (i). Grade 9 English teachers were reluctant to synchronize ITV programs with their regular teaching of English language. (ii). They were not found utilizing the ITV programs in line with the suggested procedures stated in the teacher’s guide for ITV programme. Though the teachers claimed that they have been implementing the ‘Before’, ‘During’ and ‘After’ ITV program activities, responses from student and the results of the classroom observation showed a mismatch between what actually happened in the classroom and the suggested procedures teachers were supposed to follow.

Abera (2012) conducted a study on the Effectiveness of the Practice of the Plasma-channeled English language Teaching (ELT) in Addis Ababa Preparatory Schools, Ethiopia. The study was designed to assess the overall effectiveness of the practice of the Plasma-channeled and its developments. It aimed to find out whether or not the plasma-based ELT was practiced as planned and to examine the improvements that have been made. Data collected through observation, questionnaire, interview, researcher’s diary and documentary source were analyzed by using both quantitative and qualitative techniques. The results of the study revealed that the screen teachers’ ways of delivery were tended to mismatch with students’ level of understanding. Moreover, televised activities were found to be interesting and fitting to develop students’ different language
skills, and the participation of students during the televised instruction was encouraging. However, students were given insufficient time to perform the activities and were provided with less support from their classroom teachers. The required arrangements (administrative and technical support services) were not also made for students and their teachers. Furthermore, the knowledge of the classroom teachers was found to be linked with subject matter knowledge and pedagogical knowledge; their technological pedagogical content knowledge was low. Moreover, problems like awareness, attitude, systematic linkage, professional competence, teaching-learning philosophy, speed, time, psychological and political factors were identified as major challenges of the practice of the plasma-channeled ELT. The study also revealed that allocating equal time for the classroom teacher and the plasma presenter, improving the pace of plasma presenters and the nature of screen activities and setting up a digitization project were among the improvements that have been made.

As the above reviews and experiences of the researcher (as a reader and teacher) reveal, studies that investigate the views, roles and responsibilities of schools’ stakeholders (students, teachers, principals, parents, District and Regional Education Heads and, ICTCCs); and opportunities created and challenges encountered in relation to PTV integration in teaching Biology were not studied and documented in the Eastern part of Ethiopia (Harari, Dire Dawa and Eastern Oromiya regions). Even available studies (such as Tessema, 2006; Brook, 2005, 2006; and Hussein, 2006,) were: limited in coverage, shallow, non-discipline specific (general) and not contemporary. Furthermore, grippingly, a single study was not conducted related to teaching Biology through PTV in the Eastern part of Ethiopia.

These lacunae necessitated an in-depth, discipline-specific, wider and timely study. Thus, attempts were made in the present study to
investigate the opportunities and challenges created in integrating PTV in teaching secondary school Biology in the Eastern part of Ethiopia.

1.3. Statement of the problem

The discipline Biology (also known as life science) is a field of natural science concerned with the study of mystery of Biological phenomenon termed as life. It is one of the oldest field of natural sciences that has been studied since long ago by renowned Biologists and/or scientists for its immense social, economic and scientific values.

Biology occupies a unique position in the school curriculum. It is central to several science-related courses such as Pharmacy, Medicine, Nursing, Biochemistry, Agriculture and so forth. It is apparent that no one intending to study these disciplines can do without Biology. Furthermore, our day-to-day activities are directly or indirectly linked to and/or affected by this seminal field of study - Biology. The principles of Biology apply to every person’s life and affect nearly every decision that a person makes throughout his/her life. It has paramount contributions to national as well as global growths.

In a nutshell, it can be inferred that there is no part of our life that is implicitly or explicitly, directly or indirectly not affected by Biology. To make the best use of Biology, there is a need for a thorough curricular design, devising of appropriate instructional methods and valuating/assessing their effectiveness with the aim of helping learners draw on quality education (basic Biological concepts) and apply them to make their contribution to their country (as well as to the globe) and solve their daily practical problems. Accordingly, a well designed Biology curricula should provide a learner with:

- An understanding of his or her own place in the scheme of nature, namely that he or she is a living organism and has much in common with all living organism;
• An understanding of the human body, its structure and function;
• An understanding of the diversity of life and of the interrelations of all creatures;
• An understanding of the human regarding the basic Biological problems of evolution, development and inheritance;
• An understanding of the Biological basis of many of the problems and procedures in medicine, public health, agriculture and conservation;
• An appreciation of the beauty, drama, and tragedy of the living world;
• An understanding of the historical development of some of the concepts of Biology to show that these are dependent on the contemporary techniques, technology, and nature of society;
• An understanding of the nature of scientific inquiry (that science is an open ended intellectual activity in that what is presently known or believed is subject to change without notice; that is, a scientist strives to be honest, exact, and a part of community devoted to the pursuit of truth; that scientific methods are increasingly exact and the procedures themselves are increasingly self correcting).

Even though Biology is extremely important, as briefly discussed above, different literatures (such as: FDRE, 1994, 2004; Asfaw et.al, 2009; Lasonen, et.al, 2005; ENA, 2001); complaints from the students, teachers and parents; and personal experiences of the researcher as a teacher (both at secondary schools and university levels) indicated that science subjects, Biology among them, have not been properly taught and learned in Ethiopia in general and in the Eastern part of Ethiopia in particular.

This could be attributed to many external (out of school) and internal (within school) problems that related to: (a). Poor methods of teaching of science subjects (such as using sole lectured-based
In an attempt to: (i). Tackle and alleviate the above critical problems, (ii). Achieve MDGs by 2015, (iii). To produce graduates well trained in their profession, knowledgeable and who can make their contribution to national as well as global growth; and (iv). Taking into account the serious and long-lasting previous educational policy and implementation problems; the MOE (2004) made a paradigm shift in its education systems all over the country. For instance, changes in education and training policy in 1994 focusing on four educational goals: quality, access, relevance and equity; and next a teacher education system overhaul (1994) and paradigm shift concerning the way teachers are prepared in the country for each level, and then recently in 2004 the introduction of the new mode of delivery of secondary school education [for grades 9-12] through a novel educational technology termed as PTV.

MOE considered ICT in education as one of the six key elements (ICT in education, teachers’ capacity building, Curriculum, quality, Civic and Ethical education and learning materials) of General Education Quality Improvement Package (MOE, 2009). Accordingly, MOE (2002a, b; 2004; 2010) made a considerable investment in ICT infrastructure, especially at secondary school level. Currently 71.6% of secondary schools are equipped with PTVs and 26.1% have access to internet services. Some 3,409 TV programs have already been produced in six subjects (Table 1) and consequently broadcasted through 12 satellite channels (Appendix V) to secondary schools. Some researchers (such as
Mulugeta, 2009; Kinde, 2007) indicated this as a huge investment and costed the Ethiopian government some 80 million USD to effect the project (purchase and installation of these 42 inch PTVs).

According to the FDRE (2004), the specific purposes and assumptions of the integration of PTV into classroom lessons in Ethiopian secondary schools were to: (i). Present abstract concepts in a simplified manner, (ii). Transmit uniform education to many students found in different places at the same time, (iii). Enable students to have access to model and competent teachers, and (iv). Demonstrate laboratory equipments found in one place (classroom) to other learning classrooms.

Furthermore, MOE (2004) in its document, *Guidelines on the Usage of Satellite Educational Programs TV* claimed its belief when it states:

ICT aided educational provisions open a wide opportunity for students to compete for international accomplishments and the use of ICTs in schools enhance students’ self-directed learning opportunity and their confidence as citizens. In addition, education through ICT enables students to get access to the international spectra of hobbies and fields of interest. Again, the government sees ICT as a panacea to the entire social, political, educational, cultural and economic conundrums the country has long been submerged in.

Since 2004, with the aforesaid assumptions and beliefs held by the MOE, the educational broadcast through PTV has been broadcasted and implemented in Ethiopian secondary schools till to date.

However, as various evidences (such as complaints from students, teachers and parents; researcher’s secondary school experiences) show, the educational broadcast through PTV has merits and challenges that have not been properly studied and documented with specific reference to Biology lesson broadcast. Thus, the purpose of the present study was to investigate the opportunities and challenges in integrating PTV in teaching secondary school Biology in the Eastern part of Ethiopia.
1.4. Research Questions

To properly address the aforementioned research problems, the present study was expected to answer the following basic research questions.

- What are the views, beliefs, perceptions and interests of students, Biology teachers, principals, ICTCCs, PTA’s, and REBHs towards PTV integration in teaching secondary school Biology?
- What are the opportunities created to students as well as Biology teachers as a result of integration of PTV in teaching secondary school Biology?
- What are the challenges encountered by students and teachers during PTV lesson broadcast?
- What is the level of professional competency of Biology teachers to integrate PTV lesson broadcast into the classroom teaching-learning practices?
- Do teachers practice active learning methods while PTV lesson is going on? If so, to what extent? If not, why?
- Do teachers use classroom assessments, interact with their students and give timely feedback (to students) on their classroom practices while PTV lesson is going on? If so, to what extent? If not, why?
- What other countries’ experiences show about the successful integration of TV lessons into classrooms?
- What possible solutions and alternative strategies can be suggested to maximize the benefit that can be drawn from the proper integration of PTV Biology lesson broadcast?
1.5. Objectives

1.5.1. General Objective of the Study

The general objective of the present study was to investigate the Opportunities and Challenges in integrating PTV in teaching Secondary School Biology in the Eastern part of Ethiopia.

1.5.2. Specific Objectives

The specific objectives of the present study were:-

- To assess the views, beliefs and perceptions held by students, Biology teachers, principals, PTAs, ICTCCs and REBHs towards PTV integration in teaching secondary school Biology.
- To explore the opportunities created to students as well as to Biology teachers as a result of integration of PTV in teaching Biology with respect to:
  (i). Demonstration of Biology lab practicals.
  (ii). Presentation of various instructional (teaching) aids.
  (iii). Presentation of field lessons.
  (vi). Simplified and clear presentation of Biology lessons.
  (v). PTV’s contribution to teachers’ professional development.
- To investigate the challenges (if any) encountered by students and Biology teachers (during integration of PTV Biology lesson) with respect to:
  (i). Pace (speed) of educational broadcast by PTV.
  (ii). Tradition of time sharing among students, classroom and PTV teachers.
  (iii). Understandability of instructional language of PTV.
  (iv). Availability and extent of classroom interaction in light of PTV.
  (v). Implementation of active learning methods by classroom teachers in light of PTV.
(vi). Teachers’ self-perception and beliefs as viewed vs. PTV teachers.
(vii). Teachers’ level of professional competency in integrating PTV
(viii). Technical quality of and power supply to PTV.
(ix). Extent of execution of expected roles and responsibilities by
the schools’ stakeholders towards integration of PTV.

- To review experiences of some selected countries with regard to the
successful integration of educational telecasts into classroom
teaching-learning practices.
- To suggest possible solutions and alternative strategies to maximize
the benefit that can be drawn from the proper integration of PTV.

1.6. The Need and Significance of the Study

The integration of ICT into teaching-learning processes is a complex and
multidimensional task including many dynamics such as ICT tools,
teachers, students, school administrators, educational programs and
school culture (Sutherland, 2004; Lim, 2002; Kennewell, 2001).

In this study, the integration of PTV into the teaching-learning
activities has brought about both prospects and challenges. Complaints
from teachers, student and parents are frequently heard. Since these
challenges are crucial factors that have great potential of directly or
indirectly hindering the effective integration of PTV into the classroom;
they have to be properly addressed by reassessing and redefining each
component of the schools’ teaching-learning processes where classroom
lessons are mainly presented by PTV.

Hence, there is a need to conduct a contextual and in-depth
analysis of the existing situations and suggest possible solutions/
strategies for the successful integration of PTV into classroom teaching/
learning practices in Ethiopian secondary schools focusing in teaching
Biology in secondary schools located in the Eastern part of Ethiopia.
The findings of this study will be important in the following ways. First, it points out good opportunities to be utilized by students and teachers so that it helps to improve classroom practices. Second, it identifies the major challenges that teachers and students face during PTV Biology lesson broadcast. Hence, the findings assist in searching for remedial measures. Furthermore, it attempts to show direction(s) by suggesting strategies on how to integrate and implement PTV Biology lesson broadcast along with the classroom teaching-learning practices. Third, it discloses students’, teachers’, Principals, ICTCCs, PTAs, and REBHs’ views, beliefs, perceptions and feelings about the way PTV is integrated and implemented. Fourth, the study reveals out Biology teachers’ level of professional competency and preparedness to integrate PTV into classroom practices. Thus, the findings give useful feedback to the concerned bodies such as MOE.

In general, the findings of the present study will be highly significant for students as well as to teachers, especially for policy makers at national level as it will clearly show the good opportunities to be harnessed; major challenges to be tackled; and the prevailing education and training policy document to be maintained, reviewed and/or modified. Last but not least, it is the researcher’s belief that this material contributes to the literature reviews in the areas of PTV integration, i.e. it will serve as a reference material and form the basis for the future researches in the areas of PTV integration in teaching Biology.

1.7. Delimitation of the Study

The present study was confined to only 13 Governments schools located in three regions (i.e. Oromiya, Harari and Dire Dawa Administrative regions) in the Eastern part of Ethiopia. Furthermore, it focuses only in grade ten students.
1.8. Limitations of the Study

All attempts were made to make the present study more scientific. However, as a young and novice researcher, the researcher of the present study should admit that there might be knowledge gap, lack of expertise and outstanding techniques required to produce a highly scientific paper. All these limitations might have affected the quality and outcome of the present study. Thus, this paper is by no means exhaustive and silver bullet for the problem under study. Therefore, the researcher would like to courteously leave the room for his knowledge and expertise gap to be filled by the succeeding researchers.

Furthermore, since the study was conducted in only thirteen secondary schools found in three regional states found in the Eastern part of Ethiopia, the findings of the study might not be generalized to all the secondary schools found in the country.

1.9. Operational Definitions of the Terms used

Terms that are important in communicating the findings of the study and/or that have special meanings in this thesis are listed and defined below.

**Challenges** - Problems emerging in the classroom or teaching-learning processes (through PTV) that appear to be beyond the control of the school (teachers, learners, principals, etc) and hence, understood as difficult situations [impediments]. Furthermore, it refers to school stakeholders’ (e.g. teachers’, students’, etc) unfavorable attitudes towards PTV integration. Once more, it refers to teachers’ low level of professional competency in PTV integration; lack of awareness; experience, and readiness; or symptoms of confusions in the integration/implementation of PTV lesson broadcast.
**Cooperating teachers** – Secondary school Biology Teachers (selected from each sample school) who were involved in facilitating the process of data collection. Coordinators. Appendix VIII-O.

**District** – *Woreda*(Administrative unit below region and Zone).

**Eastern part of Ethiopia** - Refers to Oromiya (Eastern and Western Hararge Zones), Harari and Dire Dawa Administrative regions.

**Educational broadcast** - Transmission or Telecasting of the Biology lessons from EEICTC (Centre of telecast) via PTV.

**Effective integration** – Integration that takes into accounts the necessary elements of ‘Proper integration’ (defined below). It also refers to the utilization of PTV in a way that helps achieve the educational goals set. It is interchangeably used with ‘successful/productive integration’.

**Global** – Refers to some selected countries (apart from Ethiopia) from which TV integration experiences are adopted. Table 2.

**ICTCC** – A ‘technician’ handling matters pertaining to PTV in schools.

**IT** – Instructional technology. It particularly refers to TV.

**Integration** – Incorporation and utilization of PTV in the teaching/learning processes.

**Item** - Question

**Learners** - students/pupils.

**Opportunities** - Good or convenient situations, events, environments or prospects created as a result of integration of PTV and are believed to bolster effective teaching-learning processes. The special educational contributions of PTV.

**Pedagogical knowledge and skill** - Principles and methods of teaching and learning activities as they are possessed (mastered) and implemented by Biology teachers in integrating PTV.

**Professional competency** – Biology teachers’ content and pedagogic knowledge and skills.

**Proper integration** – Utilization of PTV in conditions or environments where the necessary preconditions (such as human and material
resource capacities) are thoroughly built/fulfilled. It also refers to the utilization of PTV in a way that suitably supplements/enriches the classrooms lessons.

**PTV sign language teacher** – A teacher alongside the PTV teacher displayed in the lower side of the PTV screen that translates PTV lesson broadcast to aurally impaired students. Fig. 4a.

**Science education** - Biology education or Biology teaching.

**Secondary school** – Grade levels 9-12. It is also referred to as High school.

**Stakeholders** – Students, teachers, principals, PTAs, ICTCCs, DEBHs REBHs, and MOE.

**State** - The Federal Democratic Republic of Ethiopia.

**Technology** – Instructional and Educational technologies.

**Training** – Any form of (formal and informal) capacity building and awareness creating programmes (such as in-service trainings). It also refers to orientations, induction programmes, workshops, consultative meetings, etc arranged or offered to school community especially to teachers and ICTCCs with respect to the effective integration of PTV.

**Woreda** – Administrative unit below region and Zone.

### 1.9.10. Layout of the study

The present study *Opportunities and Challenges in integrating PTV in teaching secondary school Biology* is organized into five chapters. Chapter I deals with the Introduction, background of the study, statement of the problem, basic research questions, objectives, significance of the study, limitation and delimitation of the study, and operational definitions of the important terms. Chapter II in general presents reviews of related literatures. Chapter III is concerned with the research methodology which includes description of the study area, study and sample populations, sampling techniques, instruments of data collection, reliability and validity of the instruments and tools of data analysis.
Chapter IV deals with data presentation, analysis/interpretations and discussions. Finally, Chapter IV is devoted to summary, conclusion and recommendations.

1.9.11. Study Period

The present study *Opportunities and Challenges in integrating PTV in teaching secondary school Biology in the Eastern part of Ethiopia* was conducted from September 2010 to May, 2013.