A COMPARATIVE STUDY ON PLASMA TV AND TEACHER BASED INSTRUCTIONS TOWARDS IMPROVING STUDENTS' NATIONAL EXAMINATION RESULT IN ADDIS ABABA

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AND MANAGEMENT

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ACRONYMS

AAU - Addis Ababa University

BA/BSc -Bachelors of Arts/ Bachelors of Science

CAI - Computer Assisted Instruction

EMA -Educational Media Agency

EMPDA - Educational Material Production Distribution Agency

ETP - Education and Training Policy

GDP -Growth Domestic Product

ICT -Information Communication Technology

IER - Institute of Educational Research

IT -Information Technology

MA/MSc -Masters of Arts/ Masters of Science

MOE -Ministry Of Education

NEIRTEC- Northeast and the Islands Regional Technology Consortium

NOE -National Organization for Examination

PTI -Plasma TV Instruction

ST -Satellite Television

TGE -Transitional Government of Ethiopia

UNESCO-United Nation Education, Science and Cultural Organization

ABSTRACT

The purpose of the study was to compare Grade ten students' result in Biology, Chemistry, Mathematics and Physics in EGSECE in Addis Ababa secondary schools before and after the intervention of the Plasma TV instruction. Furthermore, the study was aimed at investigating the progress that has been brought about by the intervention of Plasma TV instruction as compared to the traditional teacher based instruction on students' result in EGSECE. The study was conducted in Addis Ababa city administration, in five secondary schools. These are Ayer Tena, Derartu Tulu, Kokebe Tseba, Menelik and Yekatit-12 secondary schools. The subject for the study were 532 grade ten students, out of which 272 (51.13%) were females and 260 (48.87%) were males, and forty-one teachers who have taught grade ten since 2002/2003 two years before the introduction of Plasma TV instruction at Mathematics, Biology, Physics and Chemistry subjects. In addition to the students and teachers, five school principals and five sub- city science supervisors were also included. As a result the study had a total of 583 respondents. The instruments used in this study were, questionnaire, interview and field observations. In addition secondary data that were obtained from NOE are used as a source of information. The results suggested that there was significant difference on student achievement in Chemistry, Biology, Physics and Mathematics subjects after the intervention of the Plasma TV instruction. Besides, students preferred most to learn Chemistry subject and list to learn Mathematics subject with Plasma TV instruction. The results of the finding confirm that, teaching with Plasma TV instruction is inconvenient to low achiever and medium learners. On the other hand it is convenient to high achiever learners. From the findings of this study even though, Plasma TV instruction has its own advantages, there are a lot to be done in order to integrate it with the Traditional teacher based instruction so as to improve students' result in EGSECE in particular and in their academic achievements in general.

CHAPTER ONE

THE PROBLEM AND ITS APPROACH

1.1 Background of the Problem

Education should be an endeavor to introduce the desirable changes in to a Nation. There has been remarkable progress in graduates of education in some part of the world that has better foundation in their educational system. The foundation serves both a facilitating ground as well as important input for additional development components (Wartenberg & Mayrhofer, 2001).

Due to the absence of well-prepared foundation, and especial attention given to this sector, we all recognize that there are several problems with today's education system. Moreover, the education system is under pressure and criticized in a number of ways.

Students are leaving or graduating from secondary schools unprepared to meet the demand of the society; Schools are not as good as they should be and that they are worse than in the past; teachers are sometimes said to be under skilled and under experienced; students who are not prepared to become responsible; productive citizens become a burden to society; Schools and classrooms are said to be not as well equipped as they should be; Education is said to favor high ability and high socio economic status students and to be unfair to low-ability and low socio economic status (Creemers, 1994; Arcaro, 1997).

We (Ethiopians) are at the end of the second millennium and at the same time at the end of the21stCentury. Despite the fact that education in Ethiopia started in the beginning of the 20th Century, it remained in its embryonic stage. As it is indicated in the education and training policy of Ethiopia our education is entangled with complex problems of relevance, quality, accessibility and equity (1994: 2).

After fifteen years of the implementation of the policy, some of the issues raised related to access and equity had got more or less their answer with commitment from the government side. What still persists is the problem of quality.

Quality in education is not something easy to define. In general, it is predictable degree of variation for adopted standards and dependability at low cost. Quality is customer driven and market focused (Arcaro, 1997).

There are several methods that would improve the quality of education, among these careful and planned introduction of technology can be taken as one important method (Amartya Sen, 1999). In order to improve the quality of education, Ethiopia, is spending one tenth of its GDP every year on IT (Cross m., 2005).

In this regard, the government of Ethiopia has taken several measures. Among these, the introduction of satellite television technology is the most important one.

The Education Media Agency (EMA) has launched teaching with ICT in 2004 with the view of:

- The technology-aided education helps the government to offer quality and equitable education for all children in the schools.
- By merging movement with images, IT enables teachers to teach students effectively and to offer them a clear presentation of other wise complex and obscure concepts. "A Picture is far better than one thousand words".
- ST is the easiest and most effective way to give students and their teachers the fast access to the most up to date information.
- ST enables teachers to deliver educational concepts in simple and precise way.
- ST enables the delivery of similar educational programs simultaneously to thousands of students in different corners of the country and become a cost effective strategies.
- ST enables teaching better what is already taught (Jelyan, 2006).

The introduction of the new IT in Education has also challenged with several factors, some of these challenges are:-

- The risks that, the system will not provide the benefit required or meet the expectation of the use of that system (students and teachers).

- The new technology fails to meet customer's needs no matters how technically sophisticated, it is setting itself up to fails if there is no demand from the beneficiaries.

- The intended system may require behavior, which is not ingrained in existing user, such as the use of terminals. As people generally shy away from change, such a system, which requires changes, will fail.

- ST is no way of ensuring students learning achievement while teaching, as the transmission is unidirectional (Lewin, 1998).

With the existence of these two contradictory views the program has continued its transmissions with six subjects (English, Mathematics, Biology, Physics, Chemistry, Civic and Ethical Education), in senior secondary schools from Grade nine to twelve.

Table 1: Annual Period Distribution of Subjects by ST Transmission

Grade level	Course Programs used by Subjects						Total
	Biology	Chemistry	Civic and ethical education	English	Mathematics	Physics	
9	102	102	102	170	170	102	748
10	84	84	84	140	140	84	616
11	136	138	102	136	186	136	732
12	136	138	102	136	136	136	782
Total	**458**	**458**	**309**	**582**	**632**	**458**	**2778**

Source: EMA Part 1, 2004, PII

According the information obtained from EMA officials, up to the end of April 2006, 2978 Satellite TV programs cost 33,000 birr were paid, and 8,863 Plasma TV sets were distributed with the cost of about 473 million birr. In addition, networks were stretched at a cost of about 33 million Birr, Two hundred generators at a total cost about 58.6 million birr were planted. As a result of this 2778 Satellite TV periods are being broadcasted for regular and evening classes every year (Redwan Nuri, 2006; Demissew Bekele, 2006).

All these expenditures were expected to increase the quality of education. Schools measure the quality of their out puts by student academic achievement. The basic measures of students out puts are test scores. If test scores are improving, obviously the quality of education also improves (Arcaro, 1997).

This study therefore, attempt to make a comparison on students' result in EGSEC National Examination, with related to four subjects (Mathematics, Physics, Chemistry and Biology), before and after the intervention of the Plasma TV instruction.

1.2 Statement of the Problem

Heyneman's research in developed and developing countries has led him to the conclusion that students in developing countries perform much below those of developed countries because of inadequate and poor school facilities. He indicate that comparatively the achievement of Malawi students in Mathematics and Science is below that of Thailand, Iran, Chile and developed countries such as Sweden, USA and UK(Heyneman's, 1980 cited in Tuntufye, etal., 1987).

Like the other developing countries education in Ethiopia had faced a number of problems such as inequality, in accessibility, irrelevance and low quality. To alleviate the prevailing problems the country takes some innovative programs and policy. The 1994 education and training policy document is one of the major initiatives the government had taken to alleviate some of the major educational problems to maintain quality and up date the educational system of the country (MOE, 1994).

However, the implementation of the education and training policy is being constrained with a number of factors. Among which, low academic achievement of students' at their EGSEC National Examination is one series problem all over the country in general and in Addis Ababa in particular. According to the information obtained from NOE, most government schools are unable to pass more than 50% from total number of their students who sit for EGSECE. For instance the following tables show the result of four sampled schools from Addis Ababa.

Table 2: 1996 EGSEC National Examination Results of Some Selected Secondary Schools

No	Schools	Total Number of students who sat for Exam			Students who passed the Exam (≥2.00)					
		M	F	Total	M	%	F	%	Total	%
1	DERARTU	997	1028	2025	467	46.84	254	24.73	721	35.60
2	MENELIK	907	923	1830	554	51.08	353	38.24	907	49.56
3	YEKATIT-12	675	634	1309	342	50.67	187	29.49	529	40.41
4	KOKEBE TSIBAHA	977	1063	2040	473	48.41	350	32.93	823	40.34

Source: NOE

Table3: 1997EGSEC National Examination Result of Some Selected Secondary School

No	Schools	Total Number of students who sat for Exam			Students who passed the Exam (≥2.00)					
		M	F	Total	M	%	F	%	Total	%
1	DERARTU	663	521	1184	414	62.44	204	39.15	618	52.19
2	MENELIK	775	784	1559	408	52.64	288	36.73	696	44.64
3	YEKATIT-12	621	633	1254	355	57.16	248	39.18	603	48.09
4	KOKEBE TSIBAHA	1146	1275	2421	610	53.23	419	32.86	1029	42.50

Source: NOE

From the above two tables it is possible to imagine the low level students' achievement in EGSECE.

As it is known, secondary schools have several objectives. To equip their students with the necessary knowledge and to bring about the necessary changes that make them ready to the next educational level is the corner stone of all. But, if there is large number of failures, it can be taken as indication for the presence of problem in the teaching learning process in particular and for the country development in general. To improve this condition the government has introduced a new technology (ICT) all over secondary schools in the country with the assumption that it helps to improve the result of the students' in particular and quality of education at large.

> *Quality has nothing to do with how shiny or bright something is or with how much it costs, or with how many features and gizmos it has. If the product or service meets or exceeds those expectations time and time again, then in the mind of that beneficiary, it is quality product or quality service. Quality therefore relates to the customer's perception customers or beneficiaries' compare the actual performance of the total service experience to their own set of expectations and reach a judgment that is rarely neutral (Thomas H. Berry, 1991:2).*

The introduction of the new technology costs a minimum of 662,874,000 Ethiopian birr, with out including training cost and costs of other facilities with hope of improving the quality of education.

However, as it has been explained above, quality has nothing to do with how much it costs, rather it relates to the customers perception. Are students, teachers, society and even government bodies satisfied with the introduction of ICT? Does the introduction of this technology have brought a significant impact on students' national examination result?

Therefore, it is the purpose of this study to find out the gaps that are filled by the introduction of ICT on students' result in EGSEC National Examination as compared to the previous teacher based instruction. To pin point the strength and weakness of the proper implementation of Plasma TV instruction and to give a possible and reasonable answers for the following basic questions are set: -

1. What were the major problems encountered while conducting the instructional process with the traditional teacher based instruction?
2. What are the gaps that have been filled by the introduction of the Plasma TV instruction in improving students' results in EGSEC National Examination?
3. What are the limitations of Plasma TV instruction up on improving students' results in EGSEC National Examination?
4. What changes are observed in the learning activities of students' due to the introduction of Plasma TV instruction?
5. Which method of instruction is preferred by students and teachers so as to improve students' result in EGSEC Examination?
6. Is there significant difference between teacher based instruction and Plasma TV instruction in improving students' result in EGSEC Examination?

1.3 Objectives of the Study

The general objective of this study is to analyze the significant improvement that is brought about by the introduction of Plasma TV instruction on students' results in EGSEC National Examination as compared to the traditional teacher based instruction in Addis Ababa secondary schools. Specifically, the study intends to:-

- Identify whether or not, the introduction of Plasma TV instruction brought a significant difference on students' result at Biology, Chemistry, Mathematics and Physics subjects in EGSEC Examination.
- Describe the advantages or disadvantages of Plasma TV instruction over traditional teacher based instruction.
- Identify those subjects at which students' result show significant improvement in EGSEC National Examination.

- Pin point subject(s) that are preferred or not preferred by students to learn with Plasma TV instruction.

- Discuss area of problems encountered by students and teachers while the instructional process conducted with the Plasma TV instruction.

- Explain limitations of Plasma TV instruction that needs some improvement so as to increase students' result in EGSEC National Examination.

1.4 Significance of the Study

The introduction of the new technology with huge investment aiming at improving the quality, efficiency and equity of education brought controversial issues among the whole society in general and scholars in particular. It is hoped that the study will make some contributions in the following areas: -

- It is hoped that the finding of this study will give the opportunity for all stake holders to realize their respective interests at the Plasma TV instruction.

- It enables EMA reveal their current position in the current practice of the Plasma TV instruction and make ultimate benefit from the study.

- The findings of the study provide information on those subjects that students' results brought about a significant change in EGSEC National Examination after the introduction of the Plasma TV instruction.

- The study may enable to identify the advantage of teacher based instruction on one hand and plasma TV based instruction on the other hand and make an integrative effort by concerned bodies at improving students' result in EGSEC National Examination.

- The finding of the study may encourage and help interested researchers to undertake in depth study in the future on related areas.

1.5 Delimitation of the Study

This study is delimited only to Addis Ababa secondary schools. This is because, before the intervention of Plasma TV instruction, Addis Ababa secondary schools have the comparative advantages of:

- Qualified teachers,
- Teaching aid materials, laboratories, Libraries etc.,
- And they are at the center to get different information as compared to students in other part of the country.

The study is also delimited to grade 10 students, because, these students sit for all six subjects independently that have been conducted by Plasma TV instruction. This let the researcher a reasonable comparison on the result of the students at each of these subjects before and after intervention.

Moreover, the study is delimited to mathematics, Biology, Physics and Chemistry subjects out of those six subjects that have been conducted by the Plasma TV.

Furthermore, the study is delimited to years 2002/2003-2003/2004 where the teaching learning process was conducted by teacher based instruction and years 2004/2005-2005/2006 where the teaching learning process was conducted by Plasma TV.

1.6Variables of the Study

1.6.1 Dependent Variable

The dependent variable is Students' result in EGSEC National Examination.

1.6.2 Independent Variables

This study treats

- Plasma TV instruction and teachers based instruction as independent variables

1.7 Limitation of the Study

While conducting the study, the researcher has faced the following inconvenience.

- Due to the absence of up-to-date and related literature pertaining to the impact of ICT on Students' result in National Examination on science subjects, the researcher was forced to rely more on foreign sources.

- Due to absence of well organized statistical data about students' profile, such as the number of drop out rate, repetition rate, etc. in schools and in Addis Ababa Education Bureau, create burden on the researcher to compare these variables before and after the intervention of the Plasma TV instruction.

1.8 Operational Definitions of Key Terms

Academic Achievement: - It refers to a successful accomplishment or performance in particular subjects, area, or courses usually by reasons of skill, hard work and interest, typically summarized in various types of grades marks scored or descriptive commentary (Hawes, G.R 1982). It is also refers to a successful attainment of students in EGSECE in Ethiopian secondary schools.

Efficiency: It goes beyond effectiveness by bringing in a reference to the amount of resource involved. It implies the absence of wastage in achieving the given out put (Sanyal, 1995 cited in Wossenu, 2005).

Plasma Television: Refers to the Technology of the screen that is made up of electrically charged atomic particles that exist in a fluid state and this is a modern advance in the old Television 'tube' used in house hold(Gary 2005:1 cited in Tewodros, 2006).

Plasma TV instruction: Instruction provided by Plasma TV at English, Mathematics, Biology, Physics, Chemistry and Civic and Ethical Education in senior secondary schools from Grade nine to twelve.

Quality: - Is often described in terms of inputs in to the teaching learning process (teachers, equipment, materials etc) rather than in terms of students achievements basically because inputs are easier and less costly to measure (UNESCO, 1996).

Secondary education: - Is educational structure having four years duration, which consists of two years (9-10) of general secondary education and two years (11-12) of preparation for higher education. (ETP: 1994)

1.9 Organization of the Study

The study is organized in five chapters: Chapter one, consists of introduction to the study, Statement of the Problem, Objective of the Study, Significance of the Study, Delimitation of the Study, definition of Key terms, Organization of the Study. Chapter two, deals with review of related literature. In Chapter three, Research Design and Methodology is discussed. Chapter four, treats analysis of the data. Finally in chapter five, summary of findings, conclusions and recommendation are presented.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

In this Chapter, studies related to students' achievement were reviewed. The review comprise, present and past studies on Information communication Technology, the role of Traditional teachers in the teaching learning activities, Variables that Affect Students' results in National Examination, and Strategies for improving academic achievement and teacher effectiveness up on utilization of Educational Technology.

2.1 Historical Back Ground of Educational Technology

The principle of educational technology is not new. They were vigorously heralded by curriculum reforms like Ralph-Tyler as early as the 1930's and since, 1971, and the moving spirit of 'scientific method' goes back through John Dewy's stages of problem solving to Roger bacon and Aristotle. Many divers' streams of influence have helped shape educational technology. Example media research, system analysis, educational psychology,' progressive' (child centered educational theory), communication theory, management by objectives, educational measurements, skill analysis, curriculum development and programmed learning. It also has much common ground with the literature of what might be called 'educational pathology', which seek to lay base all the diseased tissues of education (Rowntree,1988:4).

2.2 A Move from Traditional Instruction to Information Age Teaching

Before elaborating the need for a move from Traditional instruction to information age it is vital to have a firm concept on the terms; Technology, Educational Technology, information Communication Technology.

Technology: Shymansky and Kyle (1992) state the word Technology as a process involving the application of scientific knowledge and also a body of knowledge that is used in fashioning human inventions (products), for the well being of man. Technology is a source of cultural information; it is a social process achieving social ends, not an end in it. Furthermore, Miner (1985:598) define the term technology, as the process of applying science and

knowledge to human affairs, especially in transformations, processes, and products used to solve problems.

Educational Technology: According to Hawkridge (1981) the meaning of educational technology is a systematic treatment of an art. In this case, it is the art of education. The purpose of such a technology would be (to use Greek term) Telesis; progress intelligently planned and directed, the attainment of desired ends by the application of intelligently planned and directed human effort to the means. Aggarwal (2005 cited in Mathewose, 2006) further point out that, the instructional technology is concerned with determining and providing appropriate stimuli to the learner to produce certain types of response for making learning more effective. In addition, Okebukola (1996:13) indicate that educational technology to mean, the provision of learning experiences that will lead to the development of technological process skills and the acquisition of knowledge in the area of human invasion and innovation.

Further more According to Rowntree (1988), many educationalists have begun to look beyond the individual components and strengths of the teaching learning system. They have become concerned with understanding the system as a whole. Identifying aims and objectives, planning the learning environment, exploring and structuring the effects and effectiveness of the teaching learning system, and using the insights gained from evaluation to understand the system and, where possible to improve it, this is now the province of the educational technologists.

2.2.1 Information Communication Technology

ICT is un umbrella term that includes any communication device or application, encompassing; radio, television, cellular phones, computer and network hardware and software, satellite systems and so on, as well as the various services and applications associated with them, such as video conferencing and distance learning. ICTs are often spoken of in a particular context, such as ICTs in education, health care, or libraries (Foltos, 2002). As Wakshum Mekonnen (2001) indicated Information technology (IT) can be regarded as any form of communication between individuals. Smoke signals and semaphore signals for instance are ITs as they could easily establish, communication between two points or persons.

IT is Technology that has emerged from the integration of the previously separate Technologies of computers including, microcomputers, world processors and the telephone, satellite Communications, video and computer communications, facsimile transmission (fax) and the field of fiber optics, microelectronics; data storage techniques, network technologies, relating to robotics, artificial intelligence hypertext, remote sensing, voice recognition, artificial vision and scanning.

Information technology broadly includes the computing infrastructure, the communication infrastructure, and by the extension of them, the instructional infrastructure large of courses, from small classes taught by one faculty member to large, team-taught or distance-learning course.

In this context IT encompasses all means that are useful for the deliver of knowledge in the educational system.

As Harkness and Franklin (1994) reveal most societies has now found it appropriate to switch from traditional instruction to information age teaching mainly due to the extensive application of information technologies. Information age teaching entails have use of information technology and let students as the active participants of the process through out the curriculum. In the information age, the role of teacher is to employee students as thinkers and problem solvers. The traditional classroom instruction method has been changed to the students centered instruction in which the teacher coaches and the students become active participants. Moreover, the move to advanced technology use in primary and secondary school offers great hope for improving the access, quality, and efficiency of basic education. In the view of many, this move is inevitable. So far, however, these strategies have not yet lived up to their promise. If education systems are to reap a meaning full return on their investment, educators will need to better understand the key issue and formulate more sensible strategies for integrating technologies in class room instruction.

A key concern is that the implementation of technology in the school will be unevenness will lead to integrate in school quality and student learning, this will fuel political debates and policy decisions.

Educators and government officials lack clear models of successful technology use at the primary and secondary levels. Part the reason for this deficit is that the international experience that has accumulated has not been adequately shared.

The potential significance of IT in education is dramatic. Meighan and Reid (1982) argue that the shift is such that IT as we know it could destroy education. It has profound implication for the bedrock features of education itself. Technology can make all kind of information readily available, throwing doubt on the superiority of the school as a channel for the knowledge transmission. This could erode on teacher control of knowledge and the centrality of the school moves towards home-based learning is in evidence, and the traditional role of the school treat end in various ways. They argue that this could lead to existing possible developments.

> *We might see, as a result of the new technology, not the final realization of the classrooms of the 'brave new world', more impersonal than ever and raised to a new peak of instructional efficiency, but school in which the traditional goal of a liberal education, the development of wisdom, judgment, active intelligence and civic responsibility are taken seriously (Meigher and Reid, 1982: 358)*

At the micro level, it is clear that individual teachers' careers have benefited from the IT in education movement, as resource have been made available, new posts created and old posts redefined. (Sikeletal, 1985; Beyon, 1988; Baker, 1985) Argue that teachers are easily seduced in to in appropriate practices or become blind to their own skills, given the pressure they face.

From the above explanation one can understand clearly that even though, the need for educational technology is not controversial issue its implementation is constrained by several factors and it makes the move from tradition instruction to information age instruction difficult.

2.3 The Implication of Information Communication on Student National Examination Result

2.3.1 Use of IT in Teaching Learning Process

Supporting Different Learning Style: Technology can be used to support different learning styles, and meet the needs of all learners in the school. For example, technology supports a district- wide focus on differentiated learning with universal design for learning concepts, multiple means of engagement (simulations, on line manipulative, content based soft ware) and multiple means of representation (digital images, digital sound, animation, text-to-speech resources) Curriculum materials should be varied and diverse and should include digital and on line resources in addition to traditional text resources.

Technology also facilitates developmentally appropriate learning experiences by providing information in a Varity of ways (Visuals, Auditory) and at a Varity of levels (NEIRTEC, 2002).

Integrating Different Instructional Methods: Any given instructional strategy can be supported by a number of constructing Technologies (old and new) Just as any given technology might support different instructional strategies. But for any given instructional strategies some technologies are better than others, better to turn a screw with a screwdriver than a hammer. A hammer may do the trick but screwdriver is usually better than the hammer (Ehrmann S.C., 1996).

Mastering Fundamental skills: The addition of technology in the classroom has helped student's master reading writing, math's and science inquiry skill that provide a foundation for future learning. Students, especially those with few advantages in life, learn fundamental skills better and faster if they have chance to practice those technology skills.

The information technology as a whole provides the tools for advancing the new education goal. As Simonson and Thompson (1997) stated, students acquired Meta cognitive skills and higher order thinking in the new learning teaching environment.

Meta Cognitive Skills: According to Simonson and Thompson one of the most promising benefits of computer related Technology (IT) provides the possibility of helping students develop Meta cognitive skill. Meta cognitive as defined by the same authors is a major field

of cognitive and developmental psychology that refers to ones self awareness of knowledge and control of cognitive strategies during problem solving. When one responds to an object cognitively, he/she seeks information about the nature and function of the object by asking himself/ herself. Some related questions like, what is it? Who made it? Student in such a process become self-conscious about their learning and problem solving. In doing so, students are selective of the strategies to use and capable of regulating their own strategies.

Lockard, Abrams etal. (1997) stated that, the Taxonomy of Meta cognition has three levels program initiated (The soft ware is in control), guided (the soft ware suggests, but does not require actions), and learner initiated (the learner directs and controls the interactions).

Higher Order Thinking: The other benefits from IT in restructuring learning environment are the development of higher order thinking by students. In such technique of learning, students may go further thinking to know more about a process or they may move further to dig out the reasons for some occurrences or process.

Subject Matter Achievement: It was found out that the score of students using CAI are equal to or greater than the score of obtained by studies in regular instruction. Further examination showed that the greater difference occurred at the elementary grade levels. And there were no uniform effects across all subjects, with mathematics benefiting more and reading languages, arts less.

They're also some variation among the finding of the different researchers. However, they're final conclusion were identical, i.e., the achievement of students with CAI (IT) were much better than those in regular instructions.

Foltos (2002) further explain, recently, a growing number of researchers have published studies that provide substantial evidence that technology can play a positive role in academic achievement. Several organizations like Edutopia, the North Central Educational Lab (NCREL) and the Center for Applied Research in Educational Technology (CARET) are documenting research studies that link technology to increases in academic achievement. Most of this literature finds newer technologies to be either equivalent or superior to conventional instruction with regard to student learning (Bialo & Sivin, 1990).

Learning Retention and Speed: It was indicated that the CAI improved retention of learning. Students observed high retention capabilities with CAI than those with out the

technology. In addition, the use of CAI decreases the time student required to learn a given materials.

Attitudes: students who used CAI had more positive attitudes towards the content than those who did in regular classes. As some research indicated student develop positive attitudes toward themselves and towards learning. Simonson and Thomson (1997) also suggested that computer (IT) based instruction imprinted positive attitudes in students towards both the content of the lesson and the use of computer.

Lokard, Abrahams et.al. (1997) draw some conclusions from the findings of the various researchers. They made a comparative study of the various achievements of student learning with computer (IT) assisted instructions and those in regular instruction streams based on subject-matter achievement learning retention and speed, attitude and problem solving.

- **Problem Solving:** further more, Lockard, Abrams, and et.al. (1997) Showed that the potential of CAI to teach general thinking and problem solving skills was better than what the traditional class used to be, in general, it was shown that students can developed higher problem solving skills those with out CAI.

The use of educational technology in the learning processes can be summarized in the following ways: -

as Us education department(1995), state that, successful technology-rich schools generate impressive results for students, including improved achievement; higher test scores; improved student attitude, enthusiasm, and engagement; richer classroom content; and improved student retention and job placement rates. This document further expressed the effect of Technology as:-

- Educational technology has positive effect on student attitudes.
- The student population, the instructional design, the teacher's role, how the students are grouped and the level of student's access to technology influence the degree of effectiveness.
- Educational technology as demonstrated a significant positive effect on achievement. Positive effects have been found for all major subject areas, in preschool through higher education, and for both regular education and special needs students. The level

of effectiveness of educational technology is influenced by the specific student population, the software design and the teacher's role.

- Introducing technology into the learning environment has been shown to make learning more student-centered, to encourage cooperative learning, and to stimulate increased teacher/student interaction.
- Positive changes in the learning environment brought about by technology are more evolutionary than revolutionary. These changes occur over a period of years, as teachers become more experienced with technology.

2.3.2Advantage of IT over Traditional Teacher Centered Instruction

After the development of IT, the society soon realized that the teacher centered delivery of instruction was not adequate to prepare students for the future. There was a crucial need for restructuring the teaching and learning process. Students should be independent thinker to explore complex problem in order to apply what they learned to the real life situations.

Marcia Henry (1999), Show that the investment of time, training and resources on educational Technology has reaped tremendous benefits in terms of student achievement.

He further expressed that educational gains through technology were cost-effective and increased socio-economic and gender equity.

In the age of information technology, universities and schools are connected together by electronic network and thus the role of teachers has changed from teaching to somewhat guidance activity. The design of curriculum in the new environment is carefully constructed to a man of tomorrow.

Simonson and Thompson (1997) identify five important curriculum areas for children's in the information age:

These are: -

- Problem solving and critical thinking.
- Information handling skills. (Accessing, manipulating, synthesizing and evaluating).
- Global awareness, technological skills and ability to collaborate and cooperate with others.

The summary of the comparison of the traditional classrooms and the constrictive classroom is given in the following table

Traditional Classroom	Constructive Class room
• Teacher centered. • Curriculum is presented part to whole, with emphasis on basic skills. • Strict adherence to fixed curriculum is highly valued. • Curriculum activities rely heavily on textbooks and workbooks. • Students are viewed as a blank state on to which the teacher etches information. • Teachers generally behave in a didactic manner disseminating information to students.	• Learner centered. • Curriculum is presented whole to part with emphasis on big concept. • Pursuit of student question is valued. • Curriculum activity relay heavily on primary source of data and manipulative materials. • Students are viewed as thinkers with emerging theories about the world. • Teachers generally behave in an interactive manner mediating the environment for students.

Source: Simonson and Thompson (1997:31)

2.3.3 Problems of Implementing IT in School

Freynfeld and Mitson (1996 cited in Mckenzie, 1998) identified three basic problems in UK education system in applying the new technology. These are cost, technical question (skilled man power capable of managing networks and other maintenance) and problem of selecting reliable of information on the network, especially on the Internet.

According to Mckenzie (1998), though billions of dollars were expended on new IT for education, the result was not as expected. As indicated in many research articles the problems with school that tried to integrate IT with their curriculum was not just having IT but having access to the IT as valuable teaching and learning tools. The schools did not realize much the fact that technology alone would not change education. They tried to develop a system with out a person who knew at least about IT as teacher.

By nature, schools results changes that affects the existing system. It is shown that schools are networks for the sake of networking without adequate trained staff and preparing the school to clarify learning goals. Mckenzie, stressed the fact that simply cabling or computerizing schools could not eliminate the resistance and inertia of schools.

2.3.3.1 IT Deskill Teachers

One critical issue that could be frequently mentioned in related to application of information technology is the belief of "IT deskills teachers" and the argument for their perspective explained in the following ways.

IT in education might deskill teachers, or it might be used to extend teaching skills: Aple (1986:162) argues that the pressure on teachers and their limited training in IT mean that:

Instead of teachers having the time and the skill to do their own curriculum planning and deliberation, they become isolated execution of some one else's plans, procedures and evaluation mechanisms.

Lawn and Ozga (1981) have discussed the use IT to monitor teacher performances and to remove from teacher's control of both the content and pedagogy of teaching. IT comes to embody teacher's knowledge, with few teachers involved in the process.
IT is occurred super- human powers, and consciousness. In this context, human judgment is devalued, and regarded as suspect (example a reliable) in comparison.

Athanasious (1985) further pointed out, we need to know what teachers think of IT and how pupils respond to it, and teachers need to be aware of what computers can do, and the Educational TV operate as opposed to the rhetoric which surrounds them. IT is important not to equate human intelligence with machine intelligence, these has often been given weight to the imperialism of artificial intelligence; and to avoid the danger of teaching and learning being recent in mechanical terms.
Baker (1985) stated that Current use of IT may be a step back wards in terms of language development and communication skills. In contrast, a teacher can react to the individual needs of pupils with regard to ability, attitude, sex, cognitive development, cognitive skill, motivation and mood, the computer or the educational TV is basely able to account for any of these.

One of the major effects of the current emphasis on IT in the class room may be the deskilling and development of a considerable number of teachers in any region are actually given substantial information before IT curricula are implemented, after only one or two teachers are the" resident or school expert." because of this, most teachers have to relay on pre packing sets.

Professional development is essential to ensure that teachers are able to choose the most appropriate technologies and instructional strategies to meet regional curriculum goals and students learning needs.

The primary reason teachers do not use technology is a lack of experience with the technology itself (Wenglinsky, 1998). When properly trained and supported, teachers can effectively use technology to find content- based resources, delivery instruction, and support and enhance curriculum.

2.3.4 Professional Development

To alleviate all those problems and in appropriate utilization of the technology in the educational system, what is very important is to participate teachers in various professional developments.

It is important to allocate appropriate soft ware and support, to encourage the capacity building process conceder providing on site technical and instructional support for the integration of technology.

A possible strategy involves using technology integration specialists to support teachers. Training materials and modeling should show how technology can be used to support curriculum making. The push for technology and the push for standard are complementary rather than competing mandates on teachers.

Consider creating professional development centers (real or virtual) in schools or district where teachers can meet to learn practice and share new idea and strategies.

Ringstaff and Kelley (2002) discuss, on going professional development is necessary to help teacher's learner not only how to use new technology but also to provide meaning full instruction and activities using technology in the class room. Teachers cannot be expected to learn how to use educational technologies in their teaching after a one-time workshop.

Kanaya and Light (2005) further state that, Teachers' need in depth, sustained assistance in their efforts to integrate technology in to the curriculum.

Teachers also need embedded opportunities for professional learning and collaborating with colleagues in order to over come at the barriers of time and teachers daily schedules.

"Transforming schools in to 21st century learning communities mean recognizing that teachers must become members of a growing net work of shared expertise" (Fulton, Yoon, Lee, 2005).

Panel (1997) on 'educational technology', state Professional collaboration includes

Communicating with educators in similar situations and others who have experience with technology. From the above discussions, most of the problems that are associated with IT are cost, technical question, problem of selecting reliable information, and provision of the necessary training for all concerned bodies are problems that are encountered by Ethiopian secondary schools. Therefore, what will be needed is to give especial attention to solve or address those problems and make the Technology more effective than from its present condition. Provision of the necessary training can be done in face- to face meeting or by use of the advantage of technology, such as e-mail, video conferencing or by use of the plasma television itself.

2.4 The Impact of ICT in Ethiopian Schools

To sum up the review of the present and past studies on information communication technology let's look at the findings of different studies in Ethiopian case on the impact of ICT towards improving the teaching learning process.

Redwan Nuri (2006) summarized his finding on the teaching learning process of the plasma TV instruction in the following ways.

- In general grade 9 and 10, rural and urban students held positive attitude toward learning through plasma TV.
- Low achiever students held positive attitude toward learning through plasma TV.
- The less experienced teachers in teaching profession held favorable attitude towards teaching with plasma TV than experienced teachers.

- All interacted effect of the variable of the students except the interacted effect of students' grade level and residence were found not statistically significant influencing their attitude toward learning through plasma TV.

The other graduate student Semagne Adane (2006) forwards the following findings in his study.

- Regarding student attitude towards satellite TV, most of the student reported that they didn't like the satellite TV English programs. The majority of students preferred learning by classroom teachers than learning by satellite TV.
- One of the poor quality satellites TV was that it didn't draw the attention of students by revising the points covered before.
- The highest proportion of teachers and students reported that satellite TV uses different visual aids for motivating students. However, they are accompanied by too much information transmitted with a short time.

The third thesis to be revised is on topic "Teaching and Learning through Educational Technology: A Case Study on Satellite TV Instruction in Wachamo Secondary School" by Matthewose Selfago Selato (2006). He set the following findings: -

- The points the transition made are not understandable since the transmiton delivery to the class room is less intelligible and not free from any distracting mannerism. The Televised teacher is not able to explain concept clearly rather than the rhetorical transmition so that mostly student are not able to follow in a logical step- by -step order.
- Classroom teachers, televised teacher and student failed to communicate through the transmitted lesson. It is only one-way flow of message (information). No human conversation to attain clarity, it is mechanical.
- There are numerous foggy or ambiguous points thrown to students from televised teachers, Let alone for the students some of the lessons were not clear even for the teachers.
- Satellite TV has some limitation such as language (use of foreign language), fast pace of transmition, lack of time to take not, interruptions of broad cast due to

power failure and technical problems, lack of class disciplines during transmition of the lesson and so on.

- Plasma TV instruction is obsessed with (dominated by) discussion method. Other teaching methods are over looked, this result in the loss of interest on the part of the students. More over, it ignores individual differences of the student as the broad cast is approaching various students in the same method.
- TV ignores individual difference in our country secondary schools.
- The plasma TV instruction brought the role of the classroom teacher to the zero level.
- As the teacher and students seriously complained most lesson transmitted through satellite TV are too broad to understand which is similar to touching rather than teaching the lesson.

Wakshum Mekonnen (2001) on his study entitled 'The Potential of Information Technology in Education' comes up with the following conclusion.

The integration of the information technology with curriculum significantly changes the teaching-learning environment. Students become independent learners by developing their Meta cognitive skills and higher order thinking in the new instructional environment that implement in the learning process. By using IT's in their learning, students are able to discuss new ways to approach problems. And the role of teachers is also changed from providing information to somewhat coaching or guiding students through the vast information resource.

From the theoretical perspective IT has numerous values in teaching learning process but the result of the above findings are different from what is expected, its implementation is constrained by several problems. And students are unable to grasp the necessary knowledge so as to be effective in their studies. Despite, those constraints, does it bring the expected improvement at students' result in National Examination is the main them so as to measure, the effect of IT in educational process.

2.5 The Role of Traditional Teacher in the Teaching Learning Process

There are a number of indispensable roles of Traditional teachers in the teaching learning process. Before discussing on each of these roles of Traditional teachers to have a firm concept of the term 'Teaching' is very important.

Teaching: Three formal definitions are set out below

- 'Intended behavior for which the aim is to induce learning'.
- 'That array of activities that teachers' employees to transform intentions and curriculum materials in to conditions that promote learning.'
- 'Teaching involves implementing strategies that are designed to lead learners to the attachments of certain goals. In general three stages involves; communication, leader ships, motivation and control (discipline or management) (Curzon, 1993).

For the purpose of this study teaching is defined interms related directly to the concept of learning.

Curzon (1993) state a system of activity intended to induce learning comprising the deliberate and methodical creation and control of those conditions in which learning does occur.

It should be noted that teaching is seen as a system of activities, not a single action power states that teaching assumes its distinctive character and meaning not in isolated behavior, but in sequences of interrelated acts.

Teaching cycles characterize most sequential patterns of classroom activities: The cycles are based on 'episodes' intended by the teacher to induce certain types of activities and to produce learning states.

Teaching is, in effect, the systematic series of activity through which the teacher seeks to interpret his specific tasks in relation to modification of the learners' state of Knowledge.

Let's further look at each of the activities of teachers that strongly contributed to improve the academic achievement of students. Some of the most vital roles of Traditional teachers discussed as follow.

2.5.1. Teachers as Communicator

Communication: As stated by Kinard (1988) it is a two- way process of sending and receiving information, motivating and persuading, promoting, understanding and aiding in decision making.

The essence of communication is therefore, transmitting and receiving of information through a common system of signals, and symbols, whether in the form 0f writing or other signals, expressive movements, or the spoken word. It takes place when the behavior of one person acts as a stimulus for the responsive behavior of another.

Miner (1985:241) stated the following functions of organizational communication to provide information for decisions, to establish tasks, duties, authority, and responsibility, to achieve cooperation actions towards goals, to instruct and change, to provide feedback to a source. Having in mind these functions of management let's look at the meaning of communication that have value in any attempts to understand teaching –learning.

It is: -

- The process by which people attempt to share meaning via the transmission of symbolic messages (Stoner, 1989 cited in Curzon, 1993).
- An interactional process in which meaning is simulated through the sending and receiving of verbal and non- verbal messages (Tortoriello, 1978 cited in Curzon, 1993).

As Curzon (1993) identified class teaching requires the presentation of selected, appropriate stimuli and the eliciting of desired responses from the learner. Effective presentation of stimuli is, in itself, a form of communication whether pointing to a chart, tapping as a desk to attract attention or asking puzzle question, which demands interpretation and insight for its solutions. The teacher is in the process of communicating.

2.5.2 Teacher as Controller

Before elaborating the role of 'Teacher as Controller' there ought to have a firm concept on control. Kinard (1988:10) identified that in controlling; a manager continually compared the performance of the organization with its goal and takes corrective action, if needed. From these general perspectives when the concept of control brings in to the classroom, it is the process through which the teacher ensures that learning performance and conforms to the

level of desired performance. This defines what control in the classroom is intended to achieve what is required.

Mocklers (1970 cited in Cruzon, 1993) defines control in the classroom as a systematic effort to set performance standards, to design feed back systems. To compare actual performance with those predetermined standards, to determine whether there are any deviations and to measure and asses their significance and to make any action required to assure that attainment of learning objectives in the most effective and efficient way.

The definition suggest four steps in class room controls setting standards and deciding on methods of assessing the learners performance, measuring those standards and assessing the significance of the results, deciding on the acceptability or non- acceptability of performance and taking the appropriate adjusteve action.

As controller the teacher under takes the direction of the lesson, with a defined teaching objectives as goal and, a strategy aimed at attainment of that objectives. To that end the teacher requires feedback, which enables him, or adjusts future conducts by reference to past performance. As Curzon (1993:128) identified the control function is not as end in itself; rather, it is the means by which the teacher and students are able to perform a specified function, i.e. achievement of the learner objective.

The essential constituents of a control activity whether in the class room or else where are Measurement, Assessment and Adjustment. Therefore, Control (i.e. direction) cannot be effective in the absence of any one these activities.

2.5.2.1 Control in the Teaching Learning Situation

All activities constituting of control, ought to be utilized consciously during the teaching learning process. The 'out put' of the system, i.e. its accomplishment in terms of learners achievements ought to correspond to the teacher's desired objectives. Achievement is, therefore, the controlled characteristics, which must be assessed.

'Sensory devices' takes the form of tests and similar procedures. The control and activating units that respond to an assessment of the learner's deviation from his expected performance are represented by the teacher's applications of corrective actions.

According to Curzon (1993) the types of controls necessary to give the teacher effective control should be considered in relation to the specification.

- They should be economical. The fewer controls in the teaching- learning situation the better.
- They should be meaningful. What is to be measured and assessed must have significance. Trivial events can be ignored. Controls should be related only to the major activity with in the class- room learning, its rate and intensity.
- They should be appropriate. Controls in the classroom should indicate the real structure of events. They're in, hence the need for carefully constructed tests, which can analyze, as far as it is possible, the general level of class attainment.
- They should be congruent; teacher's controls must be congruent with what he or she is attempting to measure. This is an important principle in relation to phenomenal, such as interest, motivation and other highly subjective matters.
- They must be timely controls, which provide information only after a fairly long interval of time may be of little value to the future information concerning the nature of class response has to be available swiftly if it is to assist in immediate control.
- They must be simple assessment based as complicated array of grading indexes and deviation is rarely appropriate for control in a swiftly changing classrooms situation, complexity and ambiguity must be avoided if learning is to be monitored.
- They must be operational. This involves controls centered on activity, which presents results from which necessary change may be put in to operations.

2.5.3 Teachers as Manager

Teaching- managing: relevance of the analogy in the above two points, the teacher is considered as 'communicator' and 'controller'. Hoyole (1981:8) describe management as a continuous process through which members of an organization seek to co-ordinate their activities in utilizing their resource; in order to full fill the various tasks of the organization as efficiently as possible. According to Bush Tony (1986:13) management is regarded as

essentially a practical activity. The determination of aims, the allocation of resource and the effectiveness all involve action.

As Hardy (1984) suggest, schools are organization of professionals who in the manner of professionals, like to manage themselves.

It is for the practicing teacher to decide whether or not to accept as valid the analogy, which suggests the existence of important similarities between teachers and management. Some teachers will reject systems theory in its entirely as unwanted 'reductionism', which can never apply to the class room with its innumerable, rich complexities its shifting structures, its intensely individual action and its un predictable nature. The teaching- managing analogy, it is argued, meaningless, save in a very trivial sense.

Curzon (1993) further elaborate the role of teacher as a manager In favor of the analogy the perception of the teachers as one who is objectively carrying out the functions of a manager when he or she accepts planning of instruction and its administration in the interest of efficient learning. Specifically, the teacher has a management responsibility for each of the following activities. The creation and maintenance of a classroom environment in which learning can take place effectively, Constrictions and interpretation of the syllabus, Selection and articulation of teaching objectives, Selection of appropriate mode of instruction, Class motivation and control, Delivery of instruction, Assessment of student performance, Provision of information feed back to students, Ensuring relation and transfer of knowledge.

In management term there are related activities may be classified under four headings. Planning, Organization, Directing, Controlling.

As a planner, the teacher has to define the necessary instructional objectives based on his appreciation of what ought to be achieved, and when can be achieved, given a variety of constraints as organizers. He has to determine a teaching strategy based on his objectives and resources.

As a director, he has to carry out strategic tasks which involve highly important functions of motivating and encouraging students. As controller, he has to monitor and asses his student's progress and adjusts his teachings, so that objectives can be attained.

In more precise terms, the purpose of management of the teaching- learning situation is the modification of the learner's behaviors in accordance with predetermined objectives, the

attainment of which should enrich and advance personal growth. The teacher manager functions should have significance only as a contribution to that end.

In view of these several activities it is difficult to replace completely the traditional teacher or minimize their role and improve the academic achievement of students. Beyond these important activities of teachers, we should conceder several roles of teachers before implementing new strategies in the classroom.

2.6 Role of Teachers' in Effective Teaching

According to Urbanski (1995:285) teachers know their students well and know how to teach them effectively. They are generalist first, and then specialists in their own respective disciplines. They are experts in child and adolescent development and adult learning. They are knowledgeable about and sensitive to the class, and gender diversity of the environment in which they teach, and the ranks of educators are representative of their diversity. Teachers in collaboration with parents and other are the primary decision makers about the instructional needs for their students.

Teachers have the time to think systematically about their work, constantly learning, discussing, assessing and adjusting their practice. They do not stop learning when they start teaching. They read professional journals and books.

Teacher's professionalism is defined not just by what teachers know and are able to do but also by what teachers value namely, what commitments, and principles they hold for themselves and for students.

Teachers no longer feel the obligation to cover the curriculum; they view their job as helping students uncover the curriculum and to connect it to their experience and to their lives, If students are not learning, the way that teachers teach. They serve as advisors to small groups of students. They meet with the students each day and ensure that there is effective communication between the school and home.

They stay with their students for more than single year. This guarantees that there is an informed context for every need that arises for each student. Teacher recognizes that teaching kids, because they don't care how mach we know until they know how much we care.

2.6.1 The Teachers' Role in Aiding Retention and Recall

The learner can be aided in tasks of memorization, consolidation and recall if lesson preparation takes in to account certain matters. These are considered fewer than seven headings: These are Timetabling, Content, Preparedness, Presentation, Revision, Practice, and Transfer of learning. Further more as Amare (2000:79) stated that the teacher use a wide and appropriate range of teaching and learning methods and materials effectively and efficiently in order to work with large group and one- to -one. The responsibility of classroom teachers for promoting the conditions for effective learning should be seen not only in reaction for the formal presentation of an instructional program, Student needs efficient work skills if they utilize their time effectively. And this demands from the teacher's acceptance of the need to explain to them how to develop productive study habits and maximize learning opportunities.

2.6.1.1 Motivation in the Classroom

According to Curzon (1993:200) the teacher has the task of creating a learning environment, which relates the learner activity to his or her needs and aspirations, so that his or her competence is developed and strengthened, and his or her sense of self-improvement heightened. The task of the instructional designer is the one identifying the moves of students and of channeling them in to activities that accomplishes educational goals. This may necessitate a combination of teaching technique which will deliberately keep alive, utilize and strengthen, the learner initial motivation these tourniquet should take in to account the following matters: -

- Tasks set should be appropriate to the student's level of abilities. Nothing dampers motivation as much as an unrelieved diet of failure and frustration attainment of a required level of competence ought to be explained and accepted, not as an end in itself, but as a key, which opens the door to higher levels of understanding and achievement.
- Lesson material and communication ought to be meaningful, ought to arise intellectual curiosity and ought to involve students actively and personally.
- The intensity of our interest in an activity, as well as the amount of effort that we expand on it, depend on our feelings of personal involvement in that activity.

- The level of communication during lesson ought to pitch carefully so that there Is no 'Comprehension gap' between teachers and students.
- The fatigue which accompanies tediousness and which destroy motivation ought to be avoided by a planned verity of teaching and learning activities. Cognitive derived should be maximized, by arousing intellectual curiosity.
- Use a varity of motivating techniques, very stimuli; utilize intrinsic motives (curiosity, etc.) as often as possible, employ extrinsic incentives if considered necessary, are aware of differing levels of aspiration among students.
- Assimilation of lesson material ought to be tested regularly.
- Evaluation of test results ought to be conveyed to students as swiftly as possible and ought to be interpreted in the context of immediate and long-term aims.
- Competence and mastery ought to be recognized and reinforced by praise satisfaction derived from the learning process is a powerful motivator.
- Temporary failure ought to be considered by the students and teachers as an occasion for a search attempt to overcome difficulties.

According to Schmidt (1995:347) teachers the final arbiters of curricular intentions further define and shape opportunities to learn and are "midwives" of experience creating environments and implementing activities by which opportunities are converted from potential to actual experiences.

2.7 Teacher Quality and Student Achievement

Despite conventional wisdom that school inputs make little difference in student learning, a growing body of research suggests that school can make a difference, and substantial portion of those differences is attainable to teachers.

Differential teacher effectiveness is a strong determinant of differences in student learning, for our weighing the effort of differences in class size and heterogeneity (Sanders and Rivers, 1996; Horn and Sanders, 1997; Jurdan, Mendro, Weeralinghe, 1997 cited in Darling Hammond, 2000).

Student who are assigned to several ineffective teachers in a row have significantly lower achievement and gains in achievement than those who are assigned to several highly effective teachers in sequence (Sanders and Rivers, 1996).

Variables presumed to be indicative of teachers competence which have been examined for their relation ship to student learning include, measurement of academic ability, year of education, year of teacher experience, measures of subject matter and teaching knowledge, certification status, and teaching behaviors in the classroom.

Teacher's performances for students and the quality of instruction given as result of these preferences also appeared to be a significant factor in explaining relations between classroom conducted and academic achievement. Research over several decades (Dusek, 1985) documented that teachers could bring students to life, at least educationally if teachers care strongly about their student and had high hopes for their future. According to the original work in the area of teachers expectation, of achievement for a given student led to a self-fulfilling prophecy.

Byrne (1983 cited in Darling-Hammond, 2000) suggested:

> *It is surely plausible to suggest that in so far as a teacher's knowledge provides the basis for his or her effectiveness, the most relevant knowledge will be that which concerns the particular topic being taught and the relevant pedagogical strategies for teaching it to the particular types of pupils to whom it will be taught. If the teacher is to teach fractions, then it is knowledge of fractions and perhaps of closely associated topics which are of major importance similarly, knowledge of teaching strategies relevant to teaching fractions will be important.*

In the oak school experiment, Rosenthal and Jacobson administered a nonverbal intelligence test to all children in an elementary school. The test was hidden as one designed to predict academic blooming, or intellectual gain in the school year.

Teachers were told at the beginning of the semester that some students had shown unusual potential for intellectual growth.

Actually, the children named as, potential bloomers had been chosen randomly. Eight months later all children in the school were related with the same test, and the designated bloomers demonstrated significant intellectual growth, the effects showed more strongly in the first and second graders. The teachers neither spent more time with these children than with the others, nor did they treat them differently in obvious ways. Subtle influences may have been at work,

possibly the teacher's tone of voice, facial expressions, touch, and posture (Rosenthal and Jacobson, 1968).

Brophy and Evertson (1981) indicated that high expectations for student achievement appeared to be related to a beating of attitudes, beliefs, and behaviors identifying teachers and schools that maximized goals in student achievement For example, Brook over et.al. (1978) investigated variables in school climate that influenced achievement and found out that teaching in high- achieving schools spent more time or instruction and demonstrated greater concern for and commitment to their students achievement.

From all the above discussions, one can perceive the role of teacher as communicator, controller and manager, as well as his or her body expression as it is indicated in the oak experiment has a greater impact on student's classroom activity in particular and at their national examination result at large. This makes the classroom teachers indispensable at producing over all capable citizens for ones country general growth. From those detailed explanations one can easily understand that it is difficult to reduce the activity of class room teachers' role and increase the academic achievement of students.

The next part of the review is on factors affecting students result in National Examination.

2.8 Variable that Affect Students National Examination Result

There are a number of variables that affect students result in National Examination. Before looking at those factors that affect student examination result lets have a firm concept on terms like, evaluation, assessment, examination, that are used in one way or another related to student academic achievement in this text.

Evaluation: Rowntree (1988) state Evaluation as the means where by we systematically collect and analyzes information about the result of students encountered with learning experiences. We wish to understand what it is like to teach and learn with in the system we have created, to recognize which objectives have been achieved and which not; and to ascertain what unforeseen results (Beneficial or disastrous) have also materialized. Rossi and Freeman (1993) define evaluation as "the systematic application of social research procedures for assessing the conceptualization, design, implementation, and utility of programs."

Assessment: Rowntree (1988) state Assessment as an ongoing process aimed at understanding and improving student learning. It involves making our expectations explicit and public setting appropriate criteria and high standards for learning quality; systematically, gathering, analyzing, and interpreting evidence to determine how well performance matches expectations and standards; and using resulting information to document, explain, and improve performance. When it is embedded effectively with in larger institutional systems, assessment can help us focus our collective attention, examine our assumption, and create a shared academic culture dedicated to assuring and improving the quality of higher education. Assessment is an ongoing process aimed at understanding and improving student learning. It involves making our expectations explicit and public; setting appropriate criteria and high standards for learning quality; systematically gathering, analyzing, and interpreting evidence to determine how well performance matches expectations and standards; and using the resulting information to document, explain, and improve performance. When it is embedded effectively within larger institutional systems, assessment can help us focus our collective attention, examine our assumptions, and create a shared academic culture dedicated to assuring and improving the quality of higher education (AAHE Bulletin, 1995:7).

2.8.1 Influences on Predictive Validity

Several factors may influence students result in National Examinations. These include psychometric characteristics of examinations, and characteristics of schools.

2.8.1.1 Characteristics of Examinees

Examinee characteristics may influence the predictor criterion relation ship. After the review of the literature, three examinee characteristics are selected, age, gender, and repetition.

Age: The relation ship between age and achievement is made complex by grade retention, maturation, learning and nature of instruction. In study involving twelve countries, older children generally performed better than younger children (Husen, 1967). Choppin (1969) found that the effect of age on achievement, after controlling for social class, differed across countries. Walsh (1988) also found that children who were youngest in their class showed the highest chances of failure. However, Smith and Shepard (1987 cited in Ediger, 1994) noted that it was not age alone but a combination of young age and low ability that has an effect on

performance. It seems that the relation ship between and scholastic achievement may vary from one setting to another. Harnish and Archer (1986 cited in Othoon L. and Kishur N., 1994) gathered data from Japan, India, and Illinois on high school student who had completed the high school mathematics test result not only showed differences in achievement across the three countries, but also differences among countries in the relative influence exerted by students age. Specifically, in Japan older children had higher scores, but in India the younger children scored higher than their older counter parts.

Gender: Researchers have found that the girls and boys shows different academic achievement patterns in different subject at different levels of psychological development. Alken (1971) reported that on the average, girls tend to score higher than boys on tests of variable fluency, arithmetic fundamentals, and rote memory. They also found boys were superior in special ability, arithmetic, reasoning and problem solving. However, their sex differences were less pronounced in the earlier grades.

There is substantial evidence to suggest that from the beginning of secondary schooling, males frequently out perform females in mathematics (Fennema and leder, 1990; Fox and Cohn, 1980), Identified school variables as one of the reasons.

Ndunda (1990 cited in Othoon L. and Kishur N., 1994) Girl's achievement in mathematics and science in Kenya secondary schools has been lower than that of boys. The out come may be attributed to the girl's instructional experiences in mathematics and science. Therefore, examinee gender may be a moderating influence on the predictive validity of examinations.

Repetition: Repetition or grade retention is the practice of requiring a student who has been in a given grade level for a full year to remain at the level for another year. The goals of retention are to remedy in adequate academic progress and to aid in the psychological development of students who are considered emotionally immature.

Although, one of the goals of retention is to ensure academic success, research evidences indicates that this goal is hardly achieved. (Lenorduzzi and Mclaughlin, 1990 cited in Othoon L. and Kishur N., 1994) used a quasi-experimental design to examine the efforts of non-profession on academic achievement and scholastic effort where compared to those who were

promoted. However, in a follow up study on the same students, result showed no significance differences between academic achievements of the two groups.

Characteristics of Schools: School climate may affect predictive validity of examination. School climate may include the quality of teachers, types of supervisions, curriculum organization, location, and size of schools. (Anderson, 1982) suggest that each school has a unique climate and that climate influence may students out comes. However, school climate is difficult to describe and to measure. The factor easiest to measure is school size.

School Size: Finding on the effect of school size on student's achievement is equivocal. Rutter et.al. (1979) in his study found school size had no effect on educational out comes. However, the New York state department bureau of educational evaluation (1976) found that the larger the school, the lower the academic out comes of its pupil. Like wise, Coladarcils (1983) Meta analysis on the effect of school size on pupil progress shows smaller schools were superior to larger schools. However, Coladrcils also noted that much of the research on the relation ship between school size and achievement had "evidentiary and inferential errors, intellectual Puritanism, and rational wastefulness." Wyatt and Gay (1984) suggested that school size should not be seen as independent variable having any direct impact on achievement. It may, however, have a moderating effect on the predictor criterion relation ship.

2.9 Strategies for Improving Academic Achievement and Teacher Effectiveness up on Utilization of Technology

Technology will have the greatest impact on student learning when integrated into the curriculum to achieve clear, measurable educational objectives (Hawkins, Panush, & Spielvogel, 1996). In order for meaningful, sustainable school improvement to occur, school reform initiatives that involve technology need to coordinate five issues:- leadership, core vision, professional development, time, and assessment (Honey, 2001). It is clear that technology tools and resources must become an integral part of both the teaching and learning process if they are to have an impact on student achievement.

Before planning for technology, therefore, it is crucial to develop a clear set of goals, expectations, and criteria for improvements in student learning. Additionally, it is important to establish and support an ongoing staff development program tied to criteria for improvements in student learning. Then, specific curricula, practices, skills, attitudes, and policies that can be enhanced through the use of technology can be identified.

Technology can no longer be looked at in isolation but rather as part of a carefully planned program of school change as it relates to student achievement.

The following strategies suggest ways technology can be used to support improved academic achievement:

- Use technology in support of student learning in key content areas by linking to existing district or school initiatives.
- Teachers can work within specific content areas to integrate technology rather than making technology a separate subject area. Consider: What do students need to learn, and how can technology promote those learning goals? When revising curriculum in a specific subject area, the committee that is charged with this task could also be specifically charged with looking into the selection of technology tools and resources to support learning in this area. It is best if curriculum and technology leaders work together to create planning documents to ensure that district learning goals are in both the curriculum and technology plans. Working together, they can create curriculum plans that include technology skills and resources where appropriate and beneficial to student learning, identify student and teacher technology skills needed to use technologies for learning, and plan where these skills can be integrated into professional development (for teachers) and curriculum (for students).
- Technology can be used to support different learning styles and meet the needs of all learners in the district.
- After the educational goals and vision of learning through technology have been determined, it is important to provide professional development to teachers to help them choose the most appropriate technologies and instructional strategies to meet

these goals. Students cannot be expected to benefit from technology if their teachers are neither familiar nor comfortable with it. Teachers need to be supported in their efforts to use technology. The primary reason teachers do not use technology in their classrooms is a lack of experience with the technology (Wenglinsky, 1998; Rosen & Weil, 1995).

- It is important to allocate appropriate hardware, software, and support resources to encourage the capacity-building process. Consider providing on-site technical and instructional support for the integration of technology. A possible strategy involves using technology integration specialists to support teachers. Training, materials, and modeling should show how technology can be used to support curriculum, making the push for technology and the push for standards complementary rather than competing mandates on teachers. Consider creating professional development centers (real or virtual) in schools or districts where teachers can meet to learn practice, and share new ideas and strategies It is important that district/school goals and expectations support teachers in their integration efforts. Aligning teacher evaluation systems and hiring practices with the system technology goals and vision will support technology integration into the curriculum (NEIRTEC, 2002).
- Before technology is introduced in to the school, or teachers participate in their first professional development session, the educational goals for students should be determined. What do students need to learn, and how can technology promote those learning goals? To answer these questions, the school can bring together a technology planning team comprising administrators, teachers, other instructional staff, technology coordinators, students, parents, and representatives of the community. This team first develops a clear set of goals, expectations, and criteria for student learning based on National and state standards, the student population, and community concerns. Next, it determines the types of technology that will best support efforts to meet those goals. The viewpoints of parents and community members are helpful in presenting a broader perspective of skills that students need to succeed after school. In fact, community wide involvement in determining the school's technology goals benefits the entire educational process (Margaret Honey, 2005).

CHAPTER THREE

THE RESEARCH DESIGN AND METHODOLOGY

3.1 Methodology

The purpose of this study is to investigate the progress that is brought about by intervention of Plasma TV instruction as compared to the traditional teachers based instruction on students' result in EGSEC National Examination. Since the area covered was wide, descriptive survey research method was employed.

This method was chosen, because, it helps in describing the current situation of the Plasma TV instruction and to investigate the gap that was found during instruction offered by traditional teacher based instruction.

3.2 The Source of Data

Groups within the schools and outside the schools compounds were included as data sources. Among groups with in the schools; school principals, teachers and students were considered as primary source of data. From groups out side the school; science supervisors from the five sub- city education bureau were also taken as primary source of data. In addition to the primary data sources, this study relied on students' result in EGSEC National Examination from years 2002/2003 to 2005/2006 which was obtained from NOE. Moreover, information that was obtained from educational literature, journals, books, theses and Government publications was taken as secondary source of data for this study.

3.3 Sample Population and Sampling Technique

3.3.1 Sample Population

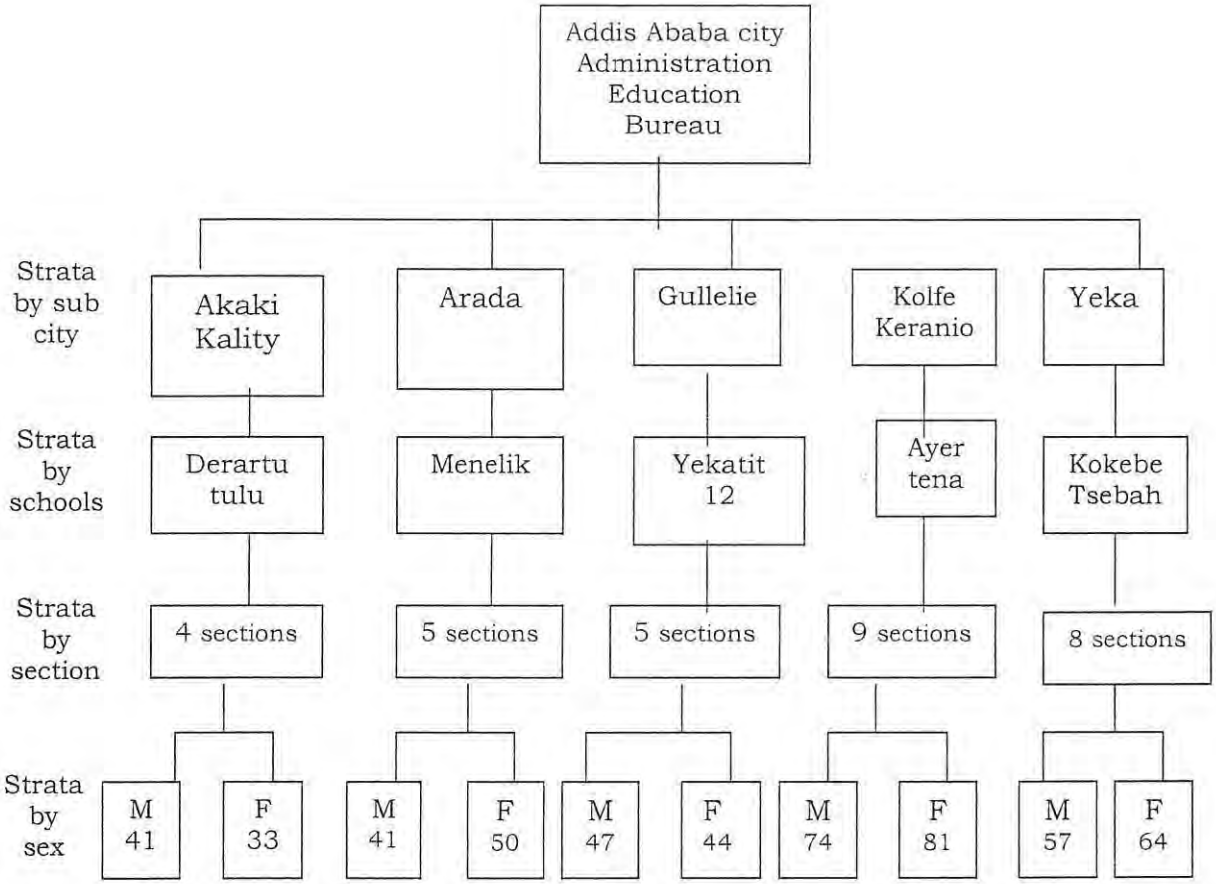
The sample of the study includes, five science supervisors from each sub- city education bureau, five school principals, from all five secondary schools, forty-one teachers who have taught grade ten since 2002/2003 at mathematics, Biology, Physics and Chemistry subjects. Moreover, five hundred thirty two students were included in the sample population. As a result the study had a total of 583 respondents.

3.3.2 Sampling Technique

Stratified sampling technique was employed in this study. Hence, there exist some degree of variation in population size among the sampled schools and it is easily possible to determine the exact number of enrollments in each school; this method of sampling was selected.

The researcher subdivided the ten-sub city of Addis Ababa city administration in to five strata to represent, the North, South, East, West, and central part of the city. Then, Gullelie Sub-city from North, Akaki Kality Sub-city from South, Yeka Sub-city from East, Kolfe- Keranio Sub-city from West and Arada Sub-city from the center were selected. Follow this, five secondary schools namely, from Gullelie, Yekatiti- 12 secondary school, from Akaki Kality, Derartu Tulu secondary school, from Yeka, Kokebe Tsebah secondary school, from Kolfe Keranio, Ayer Tena secondary school and from Arada, Menelik secondary school were taken as sample schools.

Concerning the selection of students, first 5 sections from Yekatiti 12, 4 sections from Derartu Tulu, 8 sections from Kokebe Tsebah, 9 sections from Ayertena and 5 sections from Menelik secondary schools were selected. Then, students were selected from each section according to their sex. The stratification procedure can be summarized using the following diagram.



In addition to stratified sampling, Purposive sampling was used for all other respondents like sub- city science supervisors, and school principals. This is done to collect data from each concerned bodies.

Similarly, purposive sampling technique was employed for collecting data from mathematics, Biology, Physics and Chemistry teachers who have been teaching those subjects since 2002/2003 in grade 10, because they are assumed to have better experience in teaching before and after the Plasma TV intervention and recognize the merit and demerit of both instructional methods. With regard to the sampling of sampled sections, it is felt to use simple random sampling technique. This is because there are large numbers of section in each school and it may not be possible to collect data from each section. (For detail information see appendix B1). (For the formula employed about determination of the interval for selection of random sample see Appendix C).

3.4Instruments and Procedures for Data Collection

3.4.1 Data Collecting Instruments

Primary Data

In this particular study, three types of data gathering instruments i.e. questionnaire, interviews and field observation were used.

Questionnaire: The data were collected by means of questionnaire containing 84 items. The majority of these were likert- like items based on scale from "strongly agree" to "strongly disagree". The questionnaires called on respondents to express their opinion on items categorized under the following broad topics.

- Respondents' background information,
- Problems related with classroom teacher based instruction,
- Changes that have been observed as a result of Plasma TV instruction,
- Limitation of Plasma TV instruction,
- Preferred method of instruction by teachers and students,
- Measures that need to be taken, to make the Plasma TV instruction more effective,
- Subject(s) that are preferred (not preferred) by students among subjects that are conducted by Plasma TV instruction.

Interview: Structured Interview was conducted with five science supervisors of each sub-city education bureau and Principals of the sample schools.

Field observation: This was conducted, because it lets the researcher to observe significant aspects of teachers and students activities before, during and after Plasma TV instructions. In addition, to search how much the plasma TV effectively operated during the teaching learning process.

3.4.2 Pre-Testing of Questionnaire

Pilot- Testing was conducted in Yekatit-12 Secondary School, which is the researchers' current working place. It was conducted on 20 grade ten students (11 females and 9 males) from three sections. Moreover, the questionnaire items were also Pilot-Tested on six secondary school teachers. Out of which three were selected from yekatit-12 and the remaining three were selected from Kokebe Tseba secondary schools.

In accordance with the feedback obtained from the respondent's, three questions from part three which have similar concept in one way or another were discarded and two items were included on part five as result of discussion with teachers who completed the draft questionnaire.

3.4.3 Procedure of data collection

Prior to the distribution of the revised questionnaire to the sample respondents the researcher contacted the vice principals (who are subjected for such activities) in respective schools and gave them letter written by department of Educational Planning and Management of Addis Ababa university. After mutual understanding was set with them, they let the researcher to distribute the questionnaire to the students.

The questionnaires were distributed during the normal class time at 5^{th} and 6^{th} period by asking permission from teachers of each sample section. In the mean time the field observation, document inspection, distribution of structured interview for science supervisors of each Sub- City and school directors, distribution of questionnaire for the teachers were completed. The numbers of questionnaire, structured interview distributed and collected are summarized in the following table.

Table 4: Questionnaire and structured interview distributed to and collected from respondents

School/Sub-City	Sub- City Supervisors		School Principals		Teachers		Students	
	Distributed	Collected	Distributed	Collected	Distributed	Collected	Distributed	Collected
AyerTena(Kolfe-Keranyo)	1	1	1	1	8	8	155	145
DerartuTulu(Akaki-Kality)	1	1	1	1	8	8	74	74
KokebeTseba) (Yeka)	1	1	1	1	8	8	121	117
Menelik(Arada)	1	1	1	1	8	8	91	91
Yekatit-12 (Gullellie)	1	1	1	1	9	9	91	87
Total	5	5	5	5	41	41	532	514

3.4.4 Methods of Data Analysis

The data analysis involved content analysis of documents and interviews. The raw data collected from the field was tallied, structured, organized and systematically framed.

Secondary data obtained from NOE which show students' result in EGSEC National Examination from 2002-2006 by subject was changed to percentage and represented by line graphs.

The data obtained through the questionnaires were categorized and frequency distribution made from percentages computed and inherent relationships analyzed and interpreted. For further analysis Chi-Square test and z-test were used. Alpha value of 0.05 was used for all significance tests carried out in this study.

CHAPTER FOUR

RESULTS AND DISCUSSION

This chapter deals with the presentation of the results and discussion of the data collected from four groups, Particularly, Students, Teachers School principals and Sub-city science Supervisors. All the data gathered through the questionnaire were categorized and frequency distribution made from which percentage computed and inherent relation ship analyzed and interpreted using different statistical tools depending up on the nature of questions in each items. The information gathered through interview and field observations are also qualitatively described in words to give answer for the basic research questions set in this study. As indicated in the earlier chapter, 532 questionnaires were distributed to a sample of grade ten students. Out of these 514 (96.61%) were filled and collected. From these 514 questionnaires, 16 were discarded because of inappropriate response, incomplete answers. As a result of this 498 questionnaires of the students were made ready for the analysis part. Moreover, 41 questionnaires were distributed to sample secondary school teachers. All (i.e. 100%) of the teachers questionnaires, were filled and collected. Furthermore, the entire structured interview distributed to sub- city science supervisors and school principals were collected. In addition to these data, data that was obtained from NOE, which present students' result in EGSEC National Examination from 2002/2003 to 2005/2006 are tabulated and analyzed in this part. Based on the collected data the result and discussion are presented following each table.

Table 5: Characteristics of the Respondents of the study

Variables	Characteristics Categories	Teachers		Students	
		No	%	No	%
Sex	Male	39	95.12	251	50.40
	Female	2	4.88	247	49.60
	Total	41	100	498	100
Age	From11to16 years	--	--	258	51.81
	From17to21 years	--	--	234	46.99
	above21years	--	--	6	1.20
	From20to30 years	20	48.78	--	--
	From31to40 years	14	34.15	--	--
	From41to50 years	7	17.07	--	--
	Above 50 years	0	0.00	--	--
Teaching Experience	1To5 years	14	34.14	--	--
	6To10 years	12	29.27	--	--
	11To15 years	7	17.07	--	--
	16To20 years	2	4.88	--	--
	21To26 years	5	12.19	--	--
	Above26 years	1	2.44	--	--
Educational Qualification	Diploma	0	0.00	--	--
	BA/BSC	35	85.36	--	--
	MA/MSC	4	9.76	--	--
	Other	2	4.88	--	--
Work load per week Before the introduction Of the Satellite TV	1To10	1	2.44	--	--
	11To15	0	0.00	--	--
	16To20	17	41.46	--	--
	21To25	17	41.46	--	--
	Above25	6	14.63	--	--
Work load per week After the introduction Of the Satellite TV	1To10	1	2.78	--	--
	11To15	0	0.00	--	--
	16To20	16	44.44	--	--
	21To25	15	41.67	--	--
	Above25	4	11.11	--	--
Number of years Learned by Plasma TV instruction	1 Year	--	--	57	11.44
	2Years	--	--	436	87.55
	3Years	--	--	5	1.00

Out of the total teacher participants 95.12% were males and only 4.88% of teacher respondents were females. As indicated above the participation level of female teachers was so limited, the reason for low participation level of female teachers might be, the study purposefully selected those teachers who have been teaching since 2002/2003 academic year, who are assumed to have better experience about the teaching learning process before and after the intervention of the plasma TV instruction. (For detail on the participation of male and female teachers in their respective school see Appendix B2).

Regarding student respondents 50.40% were boys and 49.60% were girls. This indicates the presence of proportional enrollment rate of boy and girl students in Addis Ababa secondary schools.

The majority of teacher respondents (i.e. 48.78%) were in age groups of 20 to 30 years and in age groups of 31 to 40 years. This age groups account about 82.93% of the total respondents.

On the other hand about 51.81% of student respondents were in age group of 11 to 16 years, and about46.99% was in age group of 17 to 21 years. Walsh (1988) found that children who have youngest in their class showed the highest chance of failure. This might be one reason for the least achievement of students in EGSEC National Examination in Addis Ababa secondary schools.

The teaching experiences of 34.14%teachers were in range of 1 to 5 years, and 29.27% were in range of 6 to10 years. These two groups account about 63.41%.From this one can infer that, in majority of these study schools there are few experienced teachers.

According to Hammond (2000), variables supposed to be factors of teacher competence which have been examined for their relationship with student learning includes, measurement of academic ability, years of education, years of teaching experience, measures of subject matter and teaching knowledge, and teaching behaviors in the class room. The effects of teacher experience on student learning have found a relationship between teachers' effectiveness and their years of experience (Murnane & Phillips, 1981; Klitgaard & Hall, 1974); therefore, experience is one factor that determines the competency level of teachers in the secondary schools and to increase students' result in EGSEC National Examination.

About 85.36%of the total respondents are BA/BSC holders, and there are also MA/MSC holders which account 9.76% of the total teacher respondents. This indicates that teachers in Addis Ababa almost meet educational level requirements of the secondary schools of the country that is set by MOE. Evidence suggests that teachers who have earned advanced degrees have a positive impact on high school mathematics and science achievement when the degrees earned were in these subjects (King Rice, 2002).

About 82.92%of the teaching load of teachers before the introduction of the satellite TV was in the range of 16 to 25 periods, and the teaching load of teachers after the introduction of the Plasma TV instruction also account about 86.11% of the total respondents. This indicates that there is no

as such a significant variation on work load of teachers before and after the introduction of the satellite TV.

On the subject of student respondents 436(87.55%) learned with Plasma TV instruction for two years. This shows that most of the students have experience to suggest on the merit and demerit of Plasma TV instruction as compared to their traditional teacher based instruction.

Table 6: Problems of Traditional Teacher Based Instruction Related to In-Puts in the Teaching Learning Process

No	Item	Respondents	Freq and %	SA	A	UD	D	SD	M	X^2
1	Un availability of qualified teachers with the required numbers.	Teachers N=41	f_o	9	21	5	4	2	3.76	12.05
			f_e	12.83	11.45	8.17	5.34	3.21	3.62	
			%	21.95	51.23	12.19	9.76	4.88		
		Students N=496	f_o	159	129	102	66	40	3.61	
			f_e	155.17	138.55	98.83	64.65	38.79	3.62	
			%	31.93	25.90	20.48	31.25	8.03		
		Total=537	f_o	168	150	107	70	42		
			f_e	168	150	107	70	42		
2	lack of science Laboratory with the required standard.	Teachers N=41	f_o	18	14	5	3	1	4.10	11.7
			f_e	25.12	8.02	2.14	3.43	2.29	4.42	
			%	40.90	34.15	12.19	7.32	2.44		
		Students N=496	f_o	311	91	23	42	29	4.23	
			f_e	303.88	96.98	25.86	41.56	27.71	4.22	
			%	62.45	18.27	4.62	8.43	5.82		
		Total=537	f_o	329	105	28	45	30		
			f_e	329	105	28	45	30		
3	Lack of utilizing a varied and divers curriculum materials other than traditional text resources.	Teachers N=41	f_o	7	22	6	5	1	3.71	16.99
			f_e	12.78	11.64	6.62	4.41	5.55	3.53	
			%	17.07	53.66	14.63	12.19	2.44		
		Students N=498	f_o	161	131	81	53	72	3.51	
			f_e	155.22	141.36	80.38	53.59	67.44	3.53	
			%	32.33	26.30	16.26	10.64	14.46		
		Total=539	f_o	168	153	87	58	73		
			f_e	168	153	87	58	73		

NOTE: SA-strongly agree, A- agree, UD- undecided, D-disagree, SD- strongly disagree, M- Weighted mean, χ^2-Chi- Square

Table 6 listed items that are considered as problems related to in-puts in the teaching learning process. As indicated in the above table, teacher respondents agreed by more than 70% (73.18%, 75.05%, and70.73%) on the first, second and third items respectively. The mean rating value of teacher respondents (i.e.3.76, 4.10, and 3.71) are greater than the expected average. Regarding student respondents, similarly they agreed (strongly agree plus agree) by more than 50 % (57.83 %, 80.72%, and 58.63% respectively), and their corresponding mean rating values of these respondents (i.e. 3.61, 4.23, and3.51) were greater than the expected average (i.e.3.00)

To look at the difference or relation ship between the responses patterns of the respondents' Chi-square test is employed.

As indicated in the above table, the result of Chi-square test (i.e.X^2=12.05, 11.7, 16.99 for item one, two and three respectively with df =4, p=0.05), are all greater than the critical value (i.e.9.49).Thus, from Chi-square test, the rating pattern of the respondents showed significant difference in all these three items;

- Un availability of qualified teachers with the required numbers,
- Lack of science laboratory with the required standards,
- Lack of utilizing varied and diverse Curriculum materials other than traditional text resources, as problems of traditional teacher based instruction.

Thus, the agreement level of teacher respondent on items one and three are substantially greater than that of student respondents. On the other hand, the agreement level of student respondents on the second item is greater than that of teacher respondents.

Table7: Problems of Traditional Teacher Based Instruction Related to the Teaching Learning Activities

No	Item	Respondents	Freq and %	SA	A	UD	D	SD	M	χ^2
1	Traditional way of instruction does not encourage active learning.	Teachers N=40	f_o	8	12	5	10	5	3.20	4.83
			f_e	4.85	9.93	9.25	10.67	5.30	2.96	
			%	19.51	29.27	12.19	24.39	12.19		
		Students N=496	f_o	57	121	119	133	66	2.94	
			f_e	60.15	123.07	114.75	132.33	65.70	2.96	
			%	11.44	24.30	23.90	26.70	13.25		
		Total=536	f_o	65	133	124	143	71		
			f_e	65	133	124	143	71		
2	Difficulty to bring all kind of necessary information in to the class room	Teachers N=41	f_o	9	22	5	3	2	3.80	11.62
			f_e	17.65	13.23	3.88	3.19	3.04	3.96	
			%	21.95	53.66	12.19	7.32	4.88		
		Students N=498	f_o	223	152	46	39	38	3.97	
			f_e	214.35	160.76	47.12	38.80	36.96	3.96	
			%	44.78	30.52	9.24	7.83	7.63		
		Total=539	f_o	232	174	51	42	40		
			f_e	232	174	51	42	40		
3	Traditional way of instruction does not make students problem solver and critical thinkers	Teachers N=41	f_o	6	11	8	8	8	2.97	6.96
			f_e	8.43	12.26	7.43	6.51	6.36	3.24	
			%	14.63	26.83	19.51	19.51	19.51		
		Students N=494	f_o	104	149	89	77	75	3.26	
			f_e	101.57	147.74	89.57	78.48	76.64	3.24	
			%	20.88	29.91	17.87	15.46	15.06		
		Total=535	f_o	110	160	97	85	83		
			f_e	110	160	97	85	83		

NOTE: SA-strongly agree, A- agree, UD- undecided, D-disagree, SD- strongly disagree, M-Weighted mean, χ^2-Chi- Square

Table7 displays the data on the problems of traditional teacher based instruction related with problems of teaching learning activities. As presented in the table, 48.78%, 75.61% and 41.46% of teacher respondents and, 35.74%, 75.30% and 50.79% of student respondents agreed on items one, two and three respectively. On the contrary, 36.50%, 12.50%and 39.02% of teacher respondents and, 39.95%, 15.46% and30.52% of student respondents showed their disagreement. The mean rating value of teacher respondents for the first and second items (i.e.3.20and 3.80) are greater

than the expected average. Concomitantly the mean rating value of teacher respondents for the third item (i.e.2.97) is less than the expected average. On the other hand the mean rating value of the first item for the student respondents (i.e.2.94) is less than the expected average. However, the mean rating value of the second and third items of student respondents (i.e.3.97 and 3.26) are greater than the expected average.

As illustrated in the above table, the result of Chi-square test for the second item(i.e.11.62) is greater than the critical value (i.e.9.49).However, the test value for first and third items(i.e.4.83 and 6.96)are less than the critical value with df=4 and p value 0.05. Therefore from Chi-square test and mean rating values it is possible to deduce that, the rating pattern of the respondents showed significant difference on one out of three items listed as problem of traditional teacher based instruction related with the teaching learning activities. Thus, the majority of the respondents to the following item appeared to the agreement scale.

- Traditional way of instruction does not make students problem solver and critical thinkers
- Traditional way of instruction does not encourage active learning

Regarding the remaining one item, the test value is greater than the critical value. As a result, although, the responses pattern revealed differences, it was not statistically significant at 0.05 alpha level.

Table8: Problems of Traditional Teacher Based Instruction Related to Efficiency, Quality and Access

No	Item	Respondents	Freq and %	SA	A	UD	D	SD	M	χ^2
1	Problem of efficiency in education	Teachers N=40	f_o	8	18	7	6	2	3.58	1.51
			f_e	7.70	15.47	7.39	6.63	3.81	3.40	
			%	19.51	43.90	17.07	14.63	4.88		
		Students N=496	f_o	93	185	90	81	48	3.39	
			f_e	93.30	187.53	89.61	80.37	46.19	3.40	
			%	18.67	37.15	18.07	16.26	9.64		
		Total=536	f_o	101	203	97	87	50		
			f_e	101	203	97	87	50		
2	Problem of quality in education	Teachers N=41	f_o	6	20	6	5	4	3.46	5.86
			f_e	10.27	14.00	8.14	5.40	3.19	3.55	
			%	14.63	48.78	14.63	12.19	9.76		
		Students N=498	f_o	129	164	101	66	38	3.56	
			f_e	124.73	170.00	98.86	65.60	38.80	3.55	
			%	25.90	32.93	20.28	13.25	7.63		
		Total=539	f_o	135	184	107	71	42		
			f_e	135	184	107	71	42		
3	Problem of access of different materials that assist the teaching learning process	Teachers N=41	f_o	18	16	4	2	1	4.17	7.88
			f_e	20.35	10.90	2.21	2.82	4.72	3.96	
			%	43.90	39.02	9.76	4.88	2.44		
		Students N=494	f_o	249	127	25	35	61	3.94	
			f_e	246.65	132.10	26.79	34.18	57.27	3.96	
			%	50.00	25.50	5.02	7.02	12.25		
		Total=535	f_o	267	143	29	37	62		
			f_e	267	143	29	37	62		

NOTE: SA-strongly agree, A- agree, UD- undecided, D-disagree, SD- strongly disagree, M-Weighted mean, χ^2-Chi- Square

Table8 displays the data on problems of traditional teacher based instruction related with, efficiency, quality and access. As depicted in the table 63.41%, 63.41% and 82.92% of teacher respondents and 55.82%, 58.83% and 75.50% of student respondents agreed on item one, two and three respectively. To the contrary, 19.51%, 21.95% and 7.32% of teacher respondents and 25.90%, 20.88% and 19.27% of student respondents disagreed. Moreover, the mean rating value

of teacher respondents (i.e.3.58, 3.46 and 3.94) and student respondents (i.e. 3.39, 3.56 and 3.94) are all greater than the expected average.

As illustrated in the above table, the result of Chi-square test (i.e.1.51, 5.86 and7.88) are all less than the critical value (i.e.9.49 with df=4 and p value 0.05)

Therefore from Chi-square test and mean rating values, it is possible to deduce that, the rating pattern of the respondents showed no significant difference on all these three items listed as problem of traditional teacher based instruction related with the teaching learning activities. Thus, the majority of the respondents to the following item appeared to the agreement scale.

- Problem of efficiency in education
- Problem of quality in education
- Problem of access of different materials that assist the teaching learning process as problems of traditional teacher based instruction

In addition to teacher and student respondents, information's were obtained through interview from school Principals and Sub-City science Supervisors on problems of traditional teacher based instruction. Majority of School Principals and Sub-City science Supervisors were stated:- language problem, problem in portion coverage with in limited school calendar, lack of qualified teachers, difference in language ability, skills and approach among teachers, student back ground difference to cope with the new curriculum, non-uniform distribution and lack of facilities of teaching materials, like Laboratories, Pedagogical centers, etc, discipline problems, difficulty to manage large number of students in a class, time constraint, especially for the Laboratory practice, difficulty to bring some ideas in to observable objects (in the form of images) and high teaching load, as problems of traditional teacher based instruction.

Table 9: Advantage of Plasma TV Instruction over Teacher Based Instruction for Teachers

No	Item	Respondents	Freq and %	SA	A	UD	D	SD	M	χ^2
1	During Plasma TV instruction class room teachers have sufficient time to assess the performance of their students.	Teachers N=41	f_o	4	8	4	16	9	2.56	9.49
			f_e	5.86	9.43	4.41	8.44	12.85	2.68	
			%	9.76	19.51	9.76	39.02	21.95		
		Students N=498	f_o	73	116	54	95	160	2.69	
			f_e	71.14	114.57	53.59	102.56	156.14	2.68	
			%	14.66	23.29	10.84	19.08	32.13		
		Total=539	f_o	77	124	58	111	169		
			f_e	77	124	58	111	169		
2	The class room teacher gets better chance to acquaint himself with his students.	Teachers N=41	f_o	1	14	2	16	8	2.61	18.18
			f_e	3.73	7.24	3.81	10.06	16.16	2.32	
			%	2.44	34.15	4.88	39.02	19.51		
		Students N=497	f_o	48	81	48	116	204	2.30	
			f_e	45.26	87.76	46.19	121.94	195.84	2.32	
			%	9.64	16.26	9.64	23.29	40.96		
		Total=538	f_o	49	95	50	132	212		
			f_e	49	95	50	132	212		
3	The class room teacher gets leisure time to enhance students' achievement	Teachers N=41	f_o	3	12	4	17	5	2.78	11.66
			f_e	5.87	7.62	5.94	10.97	10.59	2.69	
			%	7.32	29.27	9.76	41.46	12.19		
		Students N=497	f_o	74	88	74	127	134	2.68	
			f_e	71.13	92.38	72.05	133.03	128.41	2.68	
			%	14.86	17.67	14.86	25.50	26.90		
		Total=538	f_o	77	100	78	144	139		
			f_e	77	100	78	144	139		
4	The introduction of Plasma TV instruction reduce the burden of the Class room teachers.	Teachers N=41	f_o	14	22	2	2	1	4.12	34.65
			f_e	24.11	8.29	4.03	0.76	3.80	4.17	
			%	34.15	53.66	4.88	4.88	2.44		
		Students N=498	f_o	303	87	51	8	49	4.18	
			f_e	292.89	100.71	48.97	9.24	46.20	4.17	
			%	60.84	17.47	10.24	1.61	9.84		
		Total=539	f_o	317	109	53	10	50		
			f_e	317	109	53	10	50		

NOTE: SA-strongly agree, A- agree, UD- undecided, D-disagree, SD- strongly disagree

M-Weighted mean, χ^2-Chi- Square

Table 9 presents items that are assumed to be advantage of Plasma TV instruction over teacher based instruction, for teachers. In the above table teacher respondents disagreed on the first three items (i.e.60.97%, 58.53%, and53.65%) respectively. And they showed their level of agreement

with 29.27%, 36.59% and 36.79%. On the subject of student respondents, they were showed their level of agreement by 51.21%, 64.25%, and 52.40% for the first, second and third items respectively. And they indicate there level of disagreement with37.95%, 25.90% and 52.53% for the first, second and third items in the above table.

The mean rating value of the first, second and third items of teacher respondents (i.e.2.56, 2.61, and 2.78) and student respondents (i.e.2.69, 2.30 and 2.68) in the above table respectively are less than the expected average.

Moreover, the Chi-square test result (i.e.18.18, 11.66and34.68) for the second third and forth items are all greater than the critical value (i.e.9.49) with df=4 and p value 0.05. This indicates that there is statistically significance difference in the responses pattern of teacher and student respondents on items:-

- During Plasma TV instruction class room Teachers have sufficient time to assess the performance of their students,
- The class room teacher has better chance to acquaint himself with his students.
- The class room teacher has leisure time to improve students' achievement. As advantage of Plasma TV instruction.

On the other hand, majority of teacher respondents (i.e.87.81%) and student respondents (i.e.78.31%) agreed with the statement:-

- The introduction of Plasma TV instruction reduces the burden of the class room teachers, as an advantage of Plasma TV instruction.

Table 10: Advantage of Plasma TV Instruction over Teacher Based Instruction for Students

No	Item	Respondents	Freq and %	SA	A	UD	D	SD	M	χ^2
1	Plasma TV instruction helps student to be active participant in the teaching learning process	Teachers N=41	f_o	8	13	3	8	9	3.07	3.93
			f_e	10.00	10.38	1.37	10.46	8.78	3.06	
			%	19.51	31.71	7.32	19.51	21.95		
		Students N=496	f_o	123	123	15	129	106	3.06	
			f_e	121.00	125.62	16.62	126.54	106.22	3.06	
			%	24.70	24.70	3.01	25.90	21.28		
		Total=537	f_o	131	136	18	137	115		
			f_e	131	136	18	137	115		
2	Plasma TV instruction encourages students to be creative and problem solving	Teachers N=41	f_o	6	10	9	12	4	3.05	4.91
			f_e	8.67	10..34	6.24	8.75	7.00	3.12	
			%	14.63	24.39	21.95	29.27	9.76		
		Students N=498	f_o	108	126	73	103	88	3.13	
			f_e	105.33	125.65	75.76	106.25	85.00	3.12	
			%	21.69	25.30	14.66	20.68	17.67		
		Total=539	f_o	114	136	82	115	92		
			f_e	114	136	82	115	92		
3	Plasma TV instruction consider student understanding difference	Teachers N=41	f_o	2	5	3	19	12	2.17	9.87
			f_e	3.8	8.52	5.78	11.18	11.71	2.55	
			%	4.88	12.19	7.32	46.34	29.27		
		Students N=498	f_o	48	107	73	128	142	2.58	
			f_e	46.20	103.48	70.22	135.82	142.28	2.55	
			%	9.64	21.48	14.66	25.70	28.51		
		Total=539	f_o	50	112	76	147	154		
			f_e	50	112	76	147	154		
4	Students benefit a lot from the demonstration of different experiments from the Plasma TV instruction	Teachers N=41	f_o	11	24	3	3	0	4.05	22.43
			f_e	15.39	11.89	4.19	2.74	6.78	3.48	
			%	26.83	58.54	7.32	7.32	0.00		
		Students N=497	f_o	191	132	52	33	89	3.61	
			f_e	186.60	144.11	50.80	33.26	82.21	3.48	
			%	38.35	26.51	10.44	6.63	17.87		
		Total=538	f_o	202	156	55	36	89		
			f_e	202	156	55	36			

NOTE: SA-strongly agree, A- agree, UD- undecided, D-disagree, SD- strongly disagree, M-Weighted mean, χ^2-Chi- Square

Table10 presents items that are assumed to be advantage of plasma TV instruction over teacher based instruction for students. To this end, five options were presented in the list from strongly agree to strongly disagree. The data in the above table disclosed that 51.22 %, 39.02%, 17.07% and 25.37% of teacher respondents showed an agreement for the first, second, third and fourth items respectively. And 41.46%, 39.03%, 75.61% and 7.32% of teacher respondents indicated their disagreement for the items shown in the table.

The mean rating value of the first, second, and fourth items in the table (i.e. 3.07, 3.05 and 4.05) respectively are greater than the expected average. On the other hand, the mean rating value of the third item is less than the expected average (i.e.3.00).

Regarding student respondents, they showed their level of agreement by 49.40%, 46.99%, 31.12% and 64.80% for the first, second, third and fourth items respectively. And they indicated their level of disagreement by 47.18%, 38.35%, 54.21%, and 24.50% for the first, second, third and fourth items. On the other hand, the mean rating value of the third item (i.e.2.58) is less than the expected average.

The mean rating value of student respondents for the first, second, and fourth items indicated in the above table (i.e.3.06, 3.05and3.61) are greater than the expected average.

Moreover, the Chi-square test result for the first and second items (i.e.3.93 and4.91) are less than the critical value.

On the other hand Chi-square test result for the third and fourth items (i.e.9.87 and22.43) are greater than the critical value (i.e.9.49) with df=4 and p value 0.05, From the above statistical data the rating pattern of the respondents showed significant difference on two out of the four items, that are assumed to be advantage of plasma TV instruction over teacher based instruction for students. That is, the majority of teachers and student respondents to the following items appeared towards the disagreement scale:-

- Plasma TV instruction helps student to be active participant in the teaching learning process.
- Plasma TV instruction encourages students to be creative and problem solving.

As regard the remaining two items, although, the responses patterns revealed differences, they were not statistically significant at 0.05 alpha level.

Table11: Advantage of Plasma TV Instruction over Teacher Based Instruction for the Teaching Learning Process

No	Item	Respondents	Freq and %	SA	A	UD	D	SD	M	χ^2
1	The introduction of Plasma TV instruction make the teaching learning process more student centered	Teachers N=39	f_o	6	12	6	9	6	3.08	16.4
			f_e	10.24	10.46	1.96	7.62	8.71	3.15	
			%	14.63	29.27	14.63	21.95	14.63		
		Students N=498	f_o	135	132	21	96	114	3.15	
			f_e	130.76	133.54	25.04	97.37	111.28	3.15	
			%	27.11	26.51	4.22	19.28	22.89		
		Total=537	f_o	141	144	27	105	120		
			f_e	141	144	27	105	120		
2	Plasma TV instruction creates conducive atmosphere in the teaching learning process	Teachers N=41	f_o	6	17	5	9	4	3.29	18.72
			f_e	6.31	7.37	5.48	9.58	12.25	2.65	
			%	14.63	41.46	12.19	21.95	9.76		
		Students N=498	f_o	77	80	67	117	157	2.60	
			f_e	76.69	89.62	66.52	116.4	148.75	2.65	
			%	15.46	16.06	13.45	23.49	31.53		
		Total=539	f_o	83	97	72	126	161		
			f_e	83	97	72	126	161		
3	The class room discipline becomes better and better after the introduction of plasma TV instruction	Teachers N=41	f_o	9	16	2	8	6	3.34	29.37
			f_e	4.34	6.55	5.56	8.61	15.93	2.38	
			%	21.95	39.02	4.88	19.51	14.63		
		Students N=497	f_o	48	70	71	105	203	2.30	
			f_e	52.66	79.45	67.44	104.39	193.07	2.38	
			%	9.64	14.06	14.26	21.08	40.76		
		Total=538	f_o	57	86	73	113	209		
			f_e	57	86	73	113	209		

NOTE: SA-strongly agree, A- agree, UD- undecided, D-disagree, SD- strongly disagree, M-Weighted mean, χ^2-Chi- Square

Table11 displays the data on the advantage of Plasma TV instruction over teacher based instruction related with teaching learning process. As seen from the table, 43.90%, 56.09%, and 60.97% of teacher respondents and 53.62%, 31.52% and 23.70% of student respondents agreed on item one, two and three respectively. However, 36.58%, 31.71%, and 34.14% of teacher respondents and 42.17%, 55.02% and 61.84% of student respondents disagreed on the other items listed in the above table.

The mean rating value of teacher respondents (i.e.3.08, 3.29 and 3.34) for all of these three items are greater than the expected average.

On the other hand the mean rating value of student respondents for item one (i.e.3.15) is greater than the expected average. However, the mean rating value for item two and three (i.e.2.60and 2.30) are less than the expected average.

Moreover, the result of Chi-square test for the first second and third items (i.e.16.4, 18.72 and29.37) are all greater than the critical value (i.e.9.49 with df=4 and p value0.05).

From the above statistical data, the rating pattern of teacher and student respondents showed significance difference on all of these three items.

- The introduction of Plasma TV instruction makes teaching learning process more students centered.
- Plasma TV instruction creates conducive atmosphere in the teaching learning process.
- The class room Discipline becomes better and better after the introduction of Plasma TV instruction.

Thus, majority of student respondents appeared towards an agreement scale while, majority of teacher respondents appeared towards a disagreement scale for the following item:-

- The introduction of Plasma TV instruction makes teaching learning process more students centered.

On the other hand, majority of student respondents appeared towards the disagreement scale while, majority of teacher respondents appeared towards an agreement scale for the following items:-

- Plasma TV instruction creates conducive atmosphere in the teaching learning process.
- The class room Discipline becomes better and better after the introduction of Plasma TV instruction.

Table12: Advantage of Plasma TV Instruction over Teacher Based Instruction Related With Portion Coverage and Method of Teaching

No	Item	Respondents	Freq and %	SA	A	UD	D	SD	M	χ^2
1	The Plasma TV instruction help to cover the whole portion at the end of the semester	Teachers N=41	f_o	22	14	1	4	0	4.30	14.56
			f_e	15.93	10.67	5.26	2.90	6.25	3.66	
			%	53.66	34.15	2.44	9.76	0.00		
		Students N=497	f_o	187	126	68	34	82	3.61	
			f_e	193.07	129.33	63.74	35.10	75.75	3.66	
			%	37.55	25.30	13.65	6.83	16.46		
		Total=538	f_o	209	140	69	38	82		
			f_e	209	140	69	38	82		
2	The Plasma TV instruction cover all important portion of students text books	Teachers N=41	f_o	16	15	2	8	0	3.95	10.73
			f_e	13.41	12.04	6.48	5.11	3.96	3.63	
			%	39.02	36.58	4.88	19.51	0.00		
		Students N=497	f_o	160	143	83	59	52	3.60	
			f_e	162.59	145.96	78.52	61.89	48.04	3.63	
			%	32.13	28.71	16.67	11.85	10.44		
		Total=538	f_o	176	158	85	67	52		
			f_e	176	158	85	67	52		
3	Plasma TV instruction utilizes different methods of teaching	Teachers N=41	f_o	5	12	6	12	6	2.95	32.08
			f_e	16.38	12.88	4.34	3.58	3.81	3.84	
			%	12.19	29.27	14.63	29.27	14.63		
		Students N=497	f_o	210	157	51	35	44	3.91	
			f_e	198.6	156.12	52.66	43.42	46.19	3.84	
			%	42.17	31.53	10.24	7.03	8.83		
		Total=538	f_o	215	169	57	47	50		
			f_e	215	169	57	47	50		

NOTE: SA-strongly agree, A- agree, UD- undecided, D-disagree, SD- strongly disagree, M-Weighted mean, χ^2-Chi- Square

Table12 displays data on the advantage of Plasma TV instruction over teacher based instruction related with portion coverage and method of teaching. As seen from the table, 75% (87.75%, and 75.60%) of teacher respondents agreed on items one and two respectively, but only 41.46% of teacher respondents agreed on item three. As regards student respondents, they depicted their level of agreement by 62.85%, 60.84% and 73.34%, for items indicated in the table.

The mean rating value of teacher respondents for the first and second items (i.e.4.3 and3.95) are above the expected average. While the mean rating value of the third item (i.e.2.95) is less than the expected average.

On the other hand, the mean rating value of student respondents for all those three items (i.e. 3.61, 3.60 and 3.91) are greater than the expected average.

Moreover, the result of Chi-square test for the first second and third items (i.e.14.56, 10.73 and32.08) are all greater than the critical value (i.e.9.49 with df=4 and p value0.05).

From the above statistical data the rating pattern of teacher and student respondents showed significance difference on all of these three items with 0.05 levels of significance. That is, the majority of teacher respondents agreed on items:-

- The Plasma TV instruction helps to cover the whole portion at the end of the semester.
- The Plasma TV instructions cover all important portions of student's text books.

To the contrary, majority of teacher respondents appeared towards the disagreement scale for the following item:-

- Plasma TV instruction utilizes different methods of teaching.

On the other hand, majority of student respondents appeared towards the agreement scales for the following items.

- The Plasma TV instruction helps to cover the whole portion at the end of the semester.
- The Plasma TV instructions cover all important portions of students' text books.
- Plasma TV instruction utilizes different methods of teaching.

Table13: Advantage of Plasma TV Instruction over Teacher Based Instruction Related to Students' Academic achievement.

No	Item	Respondents	Freq and %	SA	A	UD	D	SD	M	χ^2
1	Plasma TV instruction improve academic achievement of students.	Teachers N=41	f_o	3	10	11	9	8	2.78	12.94
			f_e	1.75	4.72	8.15	10.36	16.00	2.17	
			%	7.32	24.39	26.83	21.95	19.51		
		Students N=497	f_o	20	52	96	127	202	2.12	
			f_e	21.25	57.27	98.84	125.63	194.00	2.17	
			%	4.02	10.44	19.28	25.50	40.56		
		Total=538	f_o	23	62	107	136	210		
			f_e	23	62	107	136	210		
2	Plasma TV instruction prepare students better for their National Examination Teacher based instruction	Teachers N=40	f_o	3	8	10	11	8	2.67	13.59
			f_e	4.25	4.10	5.89	8.36	17.39	2.23	
			%	7.32	19.51	24.39	26.83	19.51		
		Students N=496	f_o	54	47	69	101	225	2.20	
			f_e	52.75	50.89	73.10	103.64	215.61	2.23	
			%	10.84	9.44	13.85	20.28	45.18		
		Total=536	f_o	57	55	79	112	233		
			f_e	57	55	79	112	233		

NOTE: SA-strongly agree, A- agree, UD- undecided, D-disagree, SD- strongly disagree, M-Weighted mean, χ^2-Chi- Square

Table13 present, the advantages of Plasma TV instruction over teacher based instruction related to students' academic achievements. As shown in the table, 31.71% and 41.46% of teacher respondents agreed on items one and two respectively. On the other hand 41.46%and 46.34% of teacher respondents disagreed on the given items. Regarding student respondents, 14.46% and 20.28% depicted their agreement. And about 66.06% and 65.46% showed their level of disagreement on items indicated in the table.

The mean rating value of teacher respondents for both first and second items (i.e.2.78 and2.67) and the mean rating value of student respondents (i.e.2.12 and 2.20) are less than the expected average.

Moreover, the result of Chi-square test for the first and second items (i.e.12.94 and13.59) are greater than the critical value (i.e.9.49 with df=4 and p value0.05).

Therefore, the rating pattern of teacher and student respondents showed significance difference on items:-

- Plasma TV instruction improve academic achievement of students,
- Plasma TV instruction prepare students better for their National Examination, than teacher based instruction.

A number of advantages were also obtained from the interview of the principals and sub-city supervisors. Some of the major ones are:-

- Since, most of the theories are supported by animation, relatively it arose students to attained the class attentively,
- It helps to cover vast portion with short period of time,
- It helps to provide uniform teaching materials and methodology for all students,
- It improves the language skills of students,
- It minimizes the full occupation of teachers in all aspects of teaching learning process, and maximizes the participation of students,
- It helps to bring in class real life situations,
- It provides standardized and well prepared demonstration.

Tefera (2006) ' In Plasma TV Program Utilization' listed the following points as advantages of ICT for students.

- It helps the students to be active participants in the teaching and learning process,
- It encourages students to be creative and problem solving, and
- It is the source of different information.

The research findings of NEIRTEC (2002) also identified the advantages of Technology as follows:-

- Technology supports a district-wide focus on differentiated learning with universal design for learning concepts, multiple means of expression (multimedia presentation tools),
- Multiple means of engagement (simulations, online manipulative, content-based software),And
- Multiple means of representation (digital images, digital sound, animation, text-to-speech resources),

Table14: Limitation of Plasma TV instruction Related to its Instructional Process

No	Item	Respondents	Freq and %	SA	A	UD	D	SD	M	χ^2
1	Plasma TV instruction lacks the eliciting(draw out) of desire responses from the learner.	Teachers N=39	f_o	12	24	1	2	0	4.17	19.79
			f_e	10.84	13.39	5.46	4.66	4.66	3.54	
			%	31.58	63.16	2.63	5.26	0.00		
		Students N=497	f_o	137	160	74	62	64	3.49	
			f_e	138.16	170.61	69.54	59.34	59.34	3.54	
			%	27.51	32.13	14.86	12.45	12.85		
		Total=536	f_o	149	184	75	64	64		
			f_e	149	184	75	64	64		
2	Plasma TV instruction lacks assessment of student performance	Teachers N=39	f_o	17	14	1	7	0	4.05	16.59
			f_e	9.39	12.95	6.40	5.89	4.36	3.44	
			%	44.74	36.84	2.63	18.42	0.00		
		Students N=497	f_o	112	164	87	74	60	3.39	
			f_e	119.6	165.05	81.60	75.11	55.63	3.44	
			%	22.49	32.93	17.47	14.86	12.05		
		Total=536	f_o	129	178	88	81	60		
			f_e	129	178	88	81	60		
3	Plasma TV instruction lacks feed back on the past performance of the student.	Teachers N=39	f_o	18	15	1	5	0	4.18	31.74
			f_e	8.82	8.01	7.43	7.14	7.58	3.08	
			%	47.37	39.47	2.63	13.16	0.00		
		Students N=496	f_o	103	95	101	93	104	3.00	
			f_e	112.18	101.79	94.39	90.86	96.42	3.08	
			%	20.68	19.08	20.28	18.67	20.88		
		Total=535	f_o	121	110	102	98	104		
			f_e	121	110	102	98	104		
4	Plasma TV instruction lacks selection of appropriates mode of instruction.	Teachers N=39	f_o	8	16	2	12	1	3.46	11.24
			f_e	8.28	10.53	4.94	8.28	6.97	3.12	
			%	21.05	42.10	5.26	31.58	2.63		
		Students N=498	f_o	106	129	66	102	95	3.10	
			f_e	105.72	134.47	63.06	105.72	89.03	3.12	
			%	21.28	25.90	13.25	20.48	19.08		
		Total=537	f_o	114	145	68	114	96		

NOTE: SA-strongly agree, A- agree, UD- undecided, D-disagree, SD- strongly disagree, M- Weighted mean, χ^2-Chi- Square

Table 14 presents data on limitation of Plasma TV instruction related to its instructional process. As noticed from the table 94.74%, 81.58%, 86.84% and, 63.15% of teacher respondents and 59.64%, 55.42%, 39.76% and 47.18% of student respondents agreed on items one, two, three and four respectively. To the contrary, only 5.26%, 18.42%, 13.16% and 34.21% of teacher

respondents and 25.30%, 26.91%, 39.55% and 39.50% of student respondents disagreed on the item listed in the above table.

The mean rating value of teacher respondents for all items listed in the above table (i.e.4.17, 4.05, 4.18 and 3.46) are substantially greater than the expected average. Similarly the mean rating value of student respondents for the first, second and fourth items (i.e.3.49, 3.39 and 3.10) are all above the expected average.

Furthermore, the result of Chi-square test for the first second, third and fourth items (i.e.19.79, 16.59, 31.74 and11.24) are all greater than the critical value (i.e.9.49 with df=4 and p value0.05).

Therefore, from the above statistical data the rating pattern of teacher and student respondents, showed significance difference on all items with 0.05 levels of significance. Thus, the agreement level of teacher respondents were substantially greater than that of student respondents on items Plasma TV instruction lacks: -

- The eliciting (draw out) of desire responses from the learner,
- Assessment of student performance,
- Feed back on the past performance of the students,
- Selection of appropriates mode of instruction, as major limitation of Plasma TV instruction.

Table15: Limitation of Plasma TV instruction Related to Class Room Control and Motivation

No	Item	Respondents	Freq and %	SA	A	UD	D	SD	M
1	Plasma TV instruction lacks taking the appropriate adjusted action	Teachers N=39	f_o	14	16	2	7	0	3.95
			f_e	9.08	11.40	6.83	7.12	4.57	3.34
			%	36.84	42.10	5.26	18.42	0.00	
		Students N=498	f_o	111	141	92	91	63	3.29
			f_e	115.92	145.60	87.17	90.88	58.42	3.34
			%	22.29	28.31	18.47	18.27	12.65	
		Total=537	f_o	125	157	94	98	63	
			f_e	125	157	94	98	63	
2	Plasma TV instruction lacks class room motivation.	Teachers N=39	f_o	8	15	6	10	0	3.54
			f_e	10.09	11.04	5.23	7.04	5.59	3.33
			%	21.05	39.47	15.79	26.31	0.00	
		Students N=498	f_o	131	137	66	87	77	3.32
			f_e	128.90	140.96	66.77	89.95	71.41	3.33
			%	26.30	25.51	13.25	17.47	15.46	
		Total=537	f_o	139	152	72	97	77	
			f_e	139	152	72	97	77	
3	Plasma TV instruction lacks class room control.	Teachers N=39	f_o	12	12	3	9	3	3.54
			f_e	9.73	9.73	6.24	5.95	7.33	3.22
			%	31.58	31.58	7.89	23.63	7.89	
		Students N=498	f_o	122	122	83	73	98	3.19
			f_e	124.27	124.27	79.75	76.04	93.66	3.22
			%	24.50	24.50	16.67	14.66	19.68	
		Total=537	f_o	134	134	86	82	101	
			f_e	134	134	86	82	101	

NOTE: SA-strongly agree, A- agree, UD- undecided, D-disagree, SD- strongly disagree, M- Weighted mean

Table15 depicts three items on limitations of Plasma TV instructions related to classroom control, motivation and the need for the appropriate adjustment during the teaching learning process. On those three points, majority of teacher respondents (i.e.78.94%, 60.52% and 63.16%) agreed and about 18.42%, 26.31% and 31.52% disagreed on first, second and third items respectively. On the other hand, 50.6%, 51.81% and 49.00% of the rating pattern of student respondents showed agreement. And to the contrary 30.92%, 32.93% and 34.34%of the student respondents disagreed on the items listed above.

The mean rating value of teacher respondents for all items listed in the above table (i.e.3.95, 3.54 and 3.54) are substantially greater than the expected average. Similarly the mean rating values of student respondents for all items, (i.e.3.29, 3.32 and 3.19) are also greater than the expected average.

Therefore, it is possible to infer that majority of teacher and student respondents to the following three items appeared toward the agreement (strongly agree plus agree) scale. Plasma TV instruction lacks:-

- Taking the appropriate adjusted action,
- Class room motivation,
- Class room control, as limitations of Plasma TV instruction.

Table16: Limitation of Plasma TV instruction Related to Administrative Activities

No	Item	Respondents	Freq and %	SA	A	UD	D	SD	M	χ^2
1	Failure of institutionalizing of the ICT program with in the school.	Teachers N=39	f_o	4	18	6	10	1	3.36	18.05
			f_e	9.80	10.31	8.71	5.45	4.72	3.38	
			%	10.53	47.37	15.26	26.31	2.63		
		Students N=498	f_o	131	124	114	65	64	3.38	
			f_e	125.19	131.69	111.28	69.55	60.28	3.38	
			%	26.30	24.90	22.89	13.05	12.85		
		Total=537	f_o	135	142	120	75	65		
			f_e	135	142	120	75	65		
2	Poor utilization of Plasma TV instruction according to its schedule.	Teachers N=39	f_o	4	15	3	13	3	3.02	10.3
			f_e	9.51	10.97	5.16	8.06	5.23	3.29	
			%	10.53	39.47	7.89	34.21	7.89		
		Students N=498	f_o	127	136	68	98	69	3.31	
			f_e	121.49	140.03	65.84	10.29	66.77	3.29	
			%	25.50	27.31	13.65	19.68	13.85		
		Total=537	f_o	131	151	71	111	72		
			f_e	131	151	71	111	72		
3	Disruption of transmit ion during instruction due to power failure or technical problems	Teachers N=39	f_o	14	20	1	4	0	4.13	14.53
			f_e	17.32	10.89	2.54	3.70	4.14	3.88	
			%	36.84	52.63	2.63	10.53	0.00		
		Students N=498	f_o	230	130	34	47	57	3.86	
			f_e	226.28	139.10	32.46	47.30	52.86	3.88	
			%	46.18	26.10	6.83	9.44	11.44		
		Total=537	f_o	244	150	35	51	57		
			f_e	244	150	35	51	57		

NOTE: SA-strongly agree, A- agree, UD- undecided, D-disagree, SD- strongly disagree, M-Weighted mean, χ^2-Chi- Square

Table16 provides information on the level of agreement and disagreement among teacher and student respondents on limitations of Plasma TV instruction related to administrative activities. As presented in the above table,57.90%, 50.00% and 89.47% of teacher respondents and, 51.20%, 52.81% and 72.28% of student respondents agreed on items one, two and three respectively.

To the contrary, 28.94%, 42.10% and 10.53% of teacher respondents and, 25.90%, 33.53% and 20.88% of student respondents disagreed on the item listed in the table.

The mean rating values of both teacher respondents (i.e.3.36, 3.02 and 4.13) and student respondents (i.e.3.38, 3.31 and 3.86) are all above the expected average.

Furthermore, the result of Chi-square test for the first second and third items (i.e.18.05, 10.3 and14.53) are all greater than the critical value (i.e.9.49 with df=4 and p value0.05).

Therefore, from the above statistical data the rating pattern of teacher and student respondents showed significance difference, with 0.05 levels of significance on items:-

- Failure at institutionalization of the ICT program with in the school,
- Poor utilization of Plasma TV instruction according to its schedule,
- Disruption of transmition during instruction due to power failure or technical problems as limitations of Plasma TV instruction.

Nelson, Post, & Bickel (2001) explained Technology must be "institutionalized in schools" integrated into the culture and classroom practice of a school.

From the Researcher personal observation, there exists disruption of transmition more than ten times per a single lesson. This becomes very frequent as compared to year 2002/2003 when, the Plasma TV instruction was introduced in to the Schools. This might be, due to lack of proper and intensive training on the technical part of the Plasma TV and its transmition.

Table17: Changes that Have Been Observed on the Students as a Result Of Plasma TV Instruction

No	Item	Respondents	Freq and %	SA	A	UD	D	SD	M	χ^2
1	Students understand Plasma TV instruction better than the class room teachers.	Teachers N=40	f_o	1	3	3	23	10	2.05	16.58
			f_e	4.24	5.13	3.05	11.97	15.61	2.26	
			%	2.50	7.50	7.50	57.50	25.00		
		Students N=498	f_o	56	66	38	138	200	2.28	
			f_e	52.76	63.87	37.95	149.03	194.39	2.26	
			%	11.24	13.25	7.63	27.71	40.16		
		Total=538	f_o	57	69	41	161	210		
			f_e	57	69	41	161	210		
2	Student competition level increased after the introduction of the Plasma TV instruction than before its intervention.	Teachers N=38	f_o	2	8	6	13	9	2.50	7.82
			f_e	3.91	6.04	5.54	7.81	14.70	2.38	
			%	5.00	20.00	15.00	32.50	22.50		
		Students N=497	f_o	53	77	72	97	198	2.38	
			f_e	51.09	78.96	72.46	102.19	192.30	2.38	
			%	10.64	15.46	14.46	19.48	39.76		
		Total=535	f_o	55	85	78	110	207		
			f_e	55	85	78	110	207		
3	Introduction of Plasma TV instruction encourage cooperative learning than the traditional way of teaching.	Teachers N=40	f_o	0	13	4	14	9	2.52	11.52
			f_e	4.31	7.66	5.20	10.26	12.56	2.52	
			%	0.00	32.50	10.00	35.00	22.50		
		Students N=498	f_o	58	90	66	124	160	2.52	
			f_e	53.69	95.34	64.79	127.74	156.43	2.52	
			%	11.65	18.07	13.25	24.90	32.13		
		Total=538	f_o	58	103	70	138	169		
			f_e	58	103	70	138	169		
4	Students' participation with in the class room increased after the introduction of Plasma TV instruction.	Teachers N=40	f_o	2	8	6	13	11	2.42	1.38
			f_e	3.42	7.00	6.02	11.00	12.56	2.44	
			%	5.00	20.00	15.00	32.50	27.50		
		Students N=498	f_o	44	86	75	135	158	2.44	
			f_e	42.58	87.01	74.98	137.00	156.43	2.44	
			%	8.83	17.27	15.06	27.11	31.73		
		Total=538	f_o	46	94	81	148	169		
			f_e	46	94	81	148	169		

NOTE: SA-strongly agree, A- agree, UD- undecided, D-disagree, SD- strongly disagree, M-Weighted mean, χ^2-Chi- Square

Table 17 displays the data on changes that have been observed on students as a result of Plasma TV instruction. As depicted in the above table, 10.00%, 25.00%, 32.50% and 25.00%of teacher respondents and, 24.49%, 26.10%, 29.72% and 26.10% of student respondents agreed (strongly agree plus agree) on item one, two, three and four respectively.

Substantial number of teacher respondents (i.e. 82.50%, 55.00%, 57.03% and 60.00%) and student respondents (i.e.67.87%, 59.24%, 57.03% and 58.84%) disagreed on the item presented in the above table.

The mean rating value of teacher respondents (i.e.2.05, 2.50, 2.52 and 2.42) and student respondents (i.e.2.28, 2.38, 2.52 and 2.44) are below the expected average.

Furthermore, the result of Chi-square test for the first and third items (i.e.16.58 and 11.52) are greater than the critical value (i.e.9.49 with df=4 and p value0.05), While the second and fourth items (i.e.7.82 and1.38) are less than the critical value.

Therefore, the rating pattern of the respondents showed significant difference on two out of four items on changes that have been observed as a result of Plasma TV instruction. That is, the majority of teacher and student respondents to the following items appeared towards the disagreement scale:-

- Student competition level increased after the introduction of the Plasma TV instruction than before its intervention.
- Students' participation with in the class room increased after the introduction of Plasma TV instruction.

As regard the remaining items (i.e. item 1 and item 3), although, the response patterns reveled differences, they were not statistically significant at 0.05 significant levels.

Table18: Changes that have been observed on the Students' Learning Habit as a Result of Plasma TV Instruction

No	Item	Respondents	Freq and %	SA	A	UD	D	SD	M	χ^2
1	Students use there exercise books properly after the introduction of Plasma TV instruction than before its intervention.	Teachers N=40	f_o	3	7	3	15	12	2.35	9.82
			f_e	4.47	5.06	5.14	8.27	17.06	2.29	
			%	7.50	17.50	7.50	37.50	30.00		
		Students N=497	f_o	57	61	66	96	217	2.28	
			f_e	55.53	62.93	63.86	102.73	211.94	2.29	
			%	11.44	12.25	13.25	19.28	43.57		
		Total=537	f_o	60	68	69	111	229		
			f_e	60	68	69	111	229		
2	Students are encouraged to do their home work and class work after the introduction of Plasma TV instruction.	Teachers N=40	f_o	2	8	6	14	10	2.45	6.95
			f_e	2.45	5.72	6.76	8.85	16.21	2.23	
			%	5.00	20.00	15.00	35.00	25.00		
		Students N=498	f_o	31	69	85	105	208	2.22	
			f_e	30.55	71.27	84.23	110.15	201.79	2.23	
			%	6.22	13.85	17.07	21.08	41.77		
		Total=538	f_o	33	77	91	119	218		
			f_e	33	77	91	119	218		

NOTE: SA-strongly agree, A- agree, UD- undecided, D-disagree, SD- strongly disagree, M-Weighted mean, χ^2-Chi- Square

Table18 present two items on changes that have been observed on the students learning habit as a result of Plasma TV instruction. As indicated in the table, 25.00%, and 25.00% of teacher and 23.69% and 20.07% of student respondents agreed on item one and two respectively. However, significant number of teacher respondents (i.e. 67.50% and 60.00%) and student respondents (i.e. 62.85% and 62.85%) disagreed .The mean rating value of teacher respondents (i.e. 2.35 and 2.45) and student respondents (i.e. 2.28 and 2.23) are below the expected mean average.

Furthermore, the result of Chi-square test for the first item (i.e.9.82) is greater than the critical value (i.e.9.49 with df=4 and p value0.05), While the second item (i.e.6.95) is less than the critical value. These statistical data confirm that, the rating pattern of respondents showed significance difference on one out of two items of changes that have been observed as a result of Plasma TV instruction. That is, the majority of teacher and student respondents to the following item appeared towards the disagreements scale:-

- Students are encouraged to do their home work and class work after the introduction of Plasma TV instruction.

As regard the remaining item (i.e. item1) although, the response patterns revealed differences; it was not statistically significant at 0.05 significant levels.

Table19: Changes that Have Been Observed as a Result of Plasma TV Instruction Related to Time

No	Item	Respondents	Freq and %	SA	A	UD	D	SD	M	χ^2
1	Students have sufficient time to ask un clear points during the Plasma TV instruction.	Teachers N=40	f_o	3	0	3	17	17	1.87	9.55
			f_e	2.01	5.50	2.45	11.52	18.51	2.02	
			%	7.50	0.00	7.50	42.50	42.50		
		Students N=498	f_o	24	74	30	138	232	2.04	
			f_e	24.99	68.50	30.55	143.47	230.49	2.02	
			%	4.82	14.86	6.02	27.71	46.59		
		Total=538	f_o	27	74	33	155	249		
			f_e	27	74	33	155	249		
2	Students have sufficient time to ask un clear points after the Plasma TV instruction.	Teachers N=39	f_o	2	5	4	18	10	2.26	12.47
			f_e	3.19	6.61	2.25	9.95	16.99	2.20	
			%	5.00	12.50	10.00	45.00	25.00		
		Students N=498	f_o	42	86	27	119	224	2.20	
			f_e	40.80	84.39	28.75	127.05	217.00	2.20	
			%	8.43	17.27	5.42	23.90	44.98		
		Total=537	f_o	44	91	31	137	234		
			f_e	44	91	31	137	234		
3	The pace of the Plasma TV instruction is comfortable to students to follow up the lesson.	Teachers N=39	f_o	2	8	3	18	8	2.43	23.09
			f_e	1.89	3.28	4.15	9.69	19.97	1.91	
			%	5.00	20.00	7.50	45.00	20.00		
		Students N=496	f_o	24	37	54	115	266	1.87	
			f_e	24.10	41.72	52.84	123.30	254.03	1.91	
			%	4.82	7.43	10.84	23.09	53.41		
		Total=535	f_o	26	45	57	133	274		
			f_e	26	45	57	133	274		

NOTE: SA-strongly agree, A- agree, UD- undecided, D-disagree, SD- strongly disagree, M-Weighted mean, χ^2-Chi- Square

In table19 significant number of teacher respondents (i.e. 85.00%, 70.00% and 65.00%) and student respondents (i.e. 74.30%, 68.88% and 76.50%) disagreed on item one, two and three respectively.

The mean rating value of teacher respondents (i.e. 1.87, 2.26 and 2.43) and the mean rating value of student respondents (i.e. 2.04, 2.20 and 1.87) are less than the expected average.

In addition, the result of Chi-square test for the first second and third items (i.e.9.55, 12.47 and 23.09) are all greater than the critical value (i.e.9.49 with df=4 and p value0.05). From the

percentage, mean rating value and the result of Chi-square test the rating pattern of teacher and student respondents showed significant difference on all of these three items.

- Students have sufficient time to ask unclear points during the Plasma TV instruction,
- Students have sufficient time to ask unclear points after the Plasma TV instruction.
- The pace of the Plasma TV instruction is comfortable to students to follow up the lesson.

That is, the degree of disagreement of teacher respondents for the first and second items was substantially greater than that of student respondents. While, on the third item the degree of disagreement of student respondents is greater than that of teacher respondents.

Table20: Changes that Have Been Observed on Students Understanding Difference as a Result of Plasma TV Instruction

No	Item	Respondents	Freq and %	SA	A	UD	D	SD	M	χ^2
1	Teaching with Plasma TV instruction is inconvenient to slow learner.	Teachers N=40	f_o	16	16	3	3	2	1.97	12.00
			f_e	18.44	7.88	5.65	4.31	3.72	2.17	
			%	40.00	40.00	7.50	7.50	5.00		
		Students N=498	f_o	232	90	73	55	48	2.19	
			f_e	229.56	98.12	70.35	53.69	46.28	2.17	
			%	46.59	18.07	14.66	11.04	9.64		
		Total=538	f_o	248	106	76	58	50		
			f_e	248	106	76	58	50		
2	Teaching with Plasma TV instruction is inconvenient to medium learner	Teachers N=40	f_o	8	20	4	7	1	2.85	24.44
			f_e	10.75	8.36	7.76	7.46	5.67	2.72	
			%	20.00	50.00	10.00	17.50	2.50		
		Students N=496	f_o	136	92	100	93	75	2.75	
			f_e	133.25	103.64	96.24	92.54	70.33	2.72	
			%	27.31	18.47	20.08	18.67	15.06		
		Total=536	f_o	144	112	104	100	76		
			f_e	144	112	104	100	76		
3	Teaching with Plasma TV instruction is inconvenient to fast learner	Teachers N=40	f_o	5	5	4	15	11	3.55	9.25
			f_e	6.64	3.73	7.16	8.21	14.25	3.49	
			%	12.50	12.50	10.00	37.50	27.50		
		Students N=496	f_o	84	45	92	95	180	3.49	
			f_e	82.36	46.27	88.84	101.79	176.75	3.49	
			%	16.87	9.04	18.47	19.08	36.14		
		Total=536	f_o	89	50	96	110	191		
			f_e	89	50	96	110	191		

NOTE: SA-strongly agree, A- agree, UD- undecided, D-disagree, SD- strongly disagree, M- Weighted mean, χ^2-Chi- Square

Items that are listed in Table20 are negatively stated. The responses of the negatively stated items are reversibly scored. Thus, the response frequencies of the strongly agree and agree categories for negatively stated items show negative attitude of respondents. Similarly, response frequencies of disagree and strongly disagree categories indicate the positive attitude, while, the undecided categories indicate the neutral attitude. From this perspective, teacher respondents agreed by 80.00%, 70.00% and 25.00%, and similarly student respondents also agreed by 64.66%, 45.78% and 25.91%.

The mean rating value of teacher respondent for item one and two (i.e. 1.97 and 2.85) are less than the expected average (i.e. 3.00). However, the mean rating value of teacher respondents (i.e. 3.55) for the third item is above the expected average. Similarly the mean rating value of student respondents for item one and two (i.e. 2.19 and 2.75) are less than the expected average. On the other hand, the mean rating value of student respondents for the third item (i.e. 3.49) is above the expected average.

Besides, the result of Chi-square test for the first and second items (i.e.12and 24.44) are greater than the critical value (i.e.9.49 with df=4 and p value0.05), while, the test value for the third item (i.e. 9.25) is less than the critical value.

Therefore, the rating pattern of the respondents showed significant difference on two out of three items, of changes that have been observed as a result of Plasma TV instructions. That is, the majority of teacher and student respondents to the following items appeared towards the disagreement scale:-

- Teaching with Plasma TV instruction is inconvenient to fast learner.

As regards to the first and second items, although, the responses patterns revealed differences, they were not statistically significant at 0.05 significant levels.

That is, the degree of agreement of teacher respondents for the first and second items was substantially greater than that of student respondents.

Table 21: Measures That Need To Be Taken To Make the Plasma TV Instruction More Effective Related To Time

No	Item	Respondents	Freq and %	SA	A	UD	D	SD	M
1	Increasing contact hour of the class room Teacher	Teachers N=40	f_o	14	12	1	10	3	3.60
			f_e	22.38	9.96	2.23	3.20	2.23	4.18
			%	35.00	30.00	2.50	25.00	7.50	
		Students N=498	f_o	287	122	29	33	27	4.22
			f_e	278.62	124.04	27.77	39.80	27.77	4.18
			%	57.63	24.50	5.82	6.63	5.42	
		Total=538	f_o	301	134	30	43	30	
			f_e	301	134	30	43	30	
2	Adjusting the rate of the Plasma TV instruction.	Teachers N=40	f_o	14	18	3	5	0	4.02
			f_e	23.94	10.18	1.19	1.78	3.20	4.27
			%	35.00	45.00	7.50	12.50	0.00	
		Students N=498	f_o	308	119	13	19	43	4.29
			f_e	298.06	126.81	14.81	22.21	39.80	4.27
			%	61.85	23.89	2.61	3.81	8.63	
		Total=538	f_o	322	137	16	24	43	
			f_e	322	137	16	24	43	

NOTE: SA-strongly agree, A- agree, UD- undecided, D-disagree, SD- strongly disagree M-Weighted mean

Table 21 depicted measures that need to be taken to make the Plasma TV instruction more effective related to time. As shown in the table, 65.00% and 80.00% of teacher respondents and, 82.13and85.74 student respondents agreed. To the contrary, only 32.80% and 12.50% teacher respondents and, 12.05% and 12.44% of student respondents disagreed.

The mean rating value of teacher respondents (i.e. 3.60 and 4.02) and the mean rating value of student respondents (i.e. 4.22 and 4.23) are substantially above the expected average (i.e. 3.00). From these statistical descriptions, both students and teachers had strong agreement level on the statements:-

- Increasing contact hour of the class room teacher,
- Adjusting the rate of the Plasma TV instruction, as measures that need to be taken to make the Plasma TV instruction more effective.

Table22: Administrative Measures That Need to Be Taken To Make the Plasma TV Instruction More Effective

No	Item	Respondents	Freq& %	SA	A	UD	D	SD	M
1	Preparing planed tutorial program for each subject	Teachers N=40	f_o	13	15	3	3	6	3.65
			f_e	22.16	11.08	2.23	1.78	2.75	4.20
			%	32.50	37.50	7.50	7.50	15.00	
		Students N=498	f_o	285	134	27	21	31	4.25
			f_e	275.84	137.92	27.77	22.21	34.25	4.20
			%	57.23	26.90	5.42	4.22	6.22	
		Total=538	f_o	298	149	30	24	37	
			f_e	298	149	30	24	37	
2	Using Plasma TV instruction as supplementary instructional method by class room teachers.	Teachers N=40	f_o	16	17	2	5	0	4.10
			f_e	17.16	10.30	4.92	4.55	3.06	3.85
			%	40.00	42.50	5.00	12.50	0.00	
		Students N=496	f_o	214	121	64	56	41	3.83
			f_e	212.83	127.70	61.07	56.45	37.94	3.83
			%	42.97	24.30	12.85	11.24	8.23	
		Total=536	f_o	230	138	66	61	41	
			f_e	230	138	66	61	41	
3	Decreasing the present number of student below fifty per class.	Teachers N=40	f_o	21	10	3	3	3	4.07
			f_e	20.63	8.12	3.95	4.24	3.05	3.97
			%	52.50	25.00	7.50	7.50	7.50	
		Students N=497	f_o	256	99	50	54	38	3.97
			f_e	256.37	100.88	49.05	52.75	37.94	3.97
			%	51.40	19.88	10.04	10.84	7.63	
		Total=537	f_o	277	109	53	57	41	
			f_e	277	109	53	57	41	
4	Providing the Plasma TV instruction Guide for the students with sufficient copies.	Teachers N=40	f_o	13	18	3	3	3	3.87
			f_e	20.67	10.85	4.31	1.49	2.68	4.13
			%	32.50	45.00	7.50	7.50	7.50	
		Students N=498	f_o	265	128	55	17	33	4.15
			f_e	257.33	135.14	53.69	18.51	33.32	4.13
			%	53.40	25.70	11.04	3.41	6.63	
		Total=538	f_o	278	146	58	20	36	
			f_e	278	146	58	20	36	
5	Providing the Plasma TV instruction Guide for teachers with sufficient copies.	Teachers N=40	f_o	19	15	2	2	2	4.17
			f_e	16.31	12.44	5.51	2.46	3.28	3.90
			%	47.50	37.50	5.00	5.00	5.00	
		Students N=497	f_o	200	152	72	31	42	3.88
			f_e	202.69	154.56	68.49	30.54	40.72	3.90
			%	40.16	30.52	14.46	6.22	8.43	
		Total=537	f_o	219	167	74	33	44	
			f_e	219	167	74	33	44	
6	Establishing a responsible body at the sub-city level, so as to follow up the effectiveness of Plasma TV instruction.	Teachers N=40	f_o	14	16	4	3	3	3.87
			f_e	19.78	12.34	3.57	.97	3.34	4.10
			%	35.00	40.00	10.00	7.50	7.50	
		Students N=498	f_o	252	150	44	10	42	4.12
			f_e	246.22	153.66	44.43	12.03	41.65	4.10
			%	50.60	30.12	8.83	2.01	8.43	
		Total=538	f_o	266	166	48	13	45	
			f_e	266	166	48	13	45	

Table22 present administrative measures, that needs to be taken to make the Plasma TV instruction more effective. As depicted in the above table, 70.00%, 82.50%, and 77.50% of teacher respondents and 84.13%, 67.27% and 71.27% of student respondents agreed on item one, two and three respectively. However, only 22.50%, 12.50% and 15.00% of teacher respondents and 10.44, 19.47 and 18.47 of student respondents disagreed.

The mean rating value of teacher respondents (i.e. 3.65, 4.10 and4.07) and the mean rating value of student respondents (i.e. 4.25, 3.83 and 3.97) are all above the expected average. Therefore, there was strong agreement among student and teacher respondents on the following items:-

- Preparing tutorial program for each subject,
- Using Plasma TV instruction as supplementary instructional method by class room teachers,
- Decreasing the present number of students, per class below fifty, as administrative measures that need to be taken to make the Plasma TV instruction more effective.

In addition to the above measures as depicted in the above table, 77.50%, 85.00% and 75.00% of teacher respondents and 79.10%, 70.68% and 80.72% of student respondents agreed. To the contrary, 15.00%, 10.00% and 15.00% of teacher respondents and, 10.04%, 14.65% and 10.44% of student respondents disagreed on items four, five and six respectively.

The mean rating values of teacher respondents (i.e. 3.87, 4.17 and 3.87) and the mean rating values of student respondents (i.e. 4.15, 3.88 and 4.12) are substantially greater than the expected average(i.e. 3.00). Therefore,

- Providing the Plasma TV instruction Guide for the students and teachers with sufficient copies,
- Establishing a responsible body at the sub-city level, so as to follow up the effectiveness of Plasma TV instruction, are points that have reached strong agreement among student and teacher respondents, as measures that need to be taken to make the Plasma TV instruction more effective.

Table23: Measures Related to Training That Need To Be Taken to Make the Plasma Instruction More Effective

No	Item	Respondents	Freq and %	SA	A	UD	D	SD	M
1	Providing the necessary training for the class room teacher.	Teachers N=40	f_o	13	18	5	3	1	3.97
			f_e	20.22	11.60	4.61	1.56	2.01	4.16
			%	32.50	45.00	12.50	7.50	2.50	
		Students N=498	f_o	259	138	57	18	26	4.18
			f_e	251.78	144.40	57.39	19.44	24.99	4.16
			%	52.00	27.71	11.44	3.61	5.22	
		Total=538	f_o	272	156	62	21	27	
			f_e	272	156	62	21	27	
2	Providing the necessary training for the student how to learn from the Plasma TV instruction.	Teachers N=40	f_o	12	18	6	3	1	3.92
			f_e	20.45	11.30	3.94	1.71	2.60	4.13
			%	30.00	45.00	15.00	7.50	2.50	
		Students N=498	f_o	263	134	47	20	34	4.15
			f_e	254.55	140.70	49.06	21.29	32.40	4.13
			%	52.81	26.90	9.44	4.02	6.83	
		Total=538	f_o	275	152	53	23	35	
			f_e	275	152	53	23	35	

NOTE: SA-strongly agree, A- agree, UD- undecided, D-disagree, SD- strongly disagree, M-Weighted mean, χ^2-Chi- Square

Table23 represents measures related to training that, need to be taken, to make the Plasma TV instruction more effective. As depicted in the above table, 77.50% and 75.00% of teacher respondents and 79.71% and 79.71% of student respondents agreed. On the other hand, 10.00% and 10.00% of teacher respondents and, 8.83% and 10.85% of student respondents disagreed on items one and two respectively.

The mean rating value of teacher respondents (i.e. 3.97 and 3.92) and the mean rating value of student respondents (i.e. 4.18 and 4.15) are substantially greater than the expected average (i.e. 3.00). From those statistical descriptions:-

- Providing necessary training for the class room teacher,
- Providing the necessary training for the students how to learn from the

Plasma TV instruction, are indispensable measures that need to be taken to make the plasma TV instruction more effective. This idea also supported by Sherry, L., & Gibson, D. (2002) who describe, given adequate training, mentoring, access, and technical support, teachers

tend to be more willing to move to the next phase at which they become co learners and co explorers.

Table24: Subjects that are preferred and not preferred by Students to Learn with Plasma TV Instruction

Subjects	% of Students who Preferred to learn with PTI	% of Students who do not Preferred to learn with PTI
Biology	32.36	10.64
Chemistry	37.88	4.62
Physics	7.23	23.29
Mathematics	13.69	42.17
All	8.84	--
None	--	19.28

37.88% of students preferred to learn chemistry subject with Plasma TV instruction as compared to the other subjects. The reasons for their preference were, Plasma TV provides different types of experiments which let us to understand the lessons, and chemistry does not require large numbers of calculations in the majority of its lessons, are the major once.

42.17% of students do not prefer to learn mathematics subject with Plasma TV instruction as compared to other subjects.

> *Their reasons were,' it provide us a very short period of time to solve the given problems, mathematics require a number of calculations in the majority of its lessons, calculation demands enough time to try it, but, the Plasma TV does not give us chance to try it very well, before we try it to solve the given problems, the Plasma TV instructor provide the answer. Because of its incompatible speed, it is difficult to evaluate how much we know about the lesson during the Plasma TV instruction,' is the major one.*

Table25: Preferred method of instruction by teachers and students'

ITEM	Teachers		Students	
	NO	%	NO	%
Traditional method of instruction	8	20.00	325	65.26
Plasma TV instruction	20	50.00	95	19.08
Others	12	30.00	78	15.66
Total	40	100.00	498	100

Table 25 illustrates the data on method of instruction preferred by teachers' and students'. As seen from the above table, about 20.00% of teacher respondents preferred 'Traditional method of instruction'. On the other hand, majority of teacher respondents (i.e. about 50.00%) preferred' Plasma TV instruction'. The remaining 30.00% preferred an integrated method of instruction. In this regard, substantial number of teacher respondents listed the following points for their preference of Plasma TV instruction.

- Plasma TV instruction helps students to visualize some ideas by practical activities,
- It help to cover the portion set for the given Academic year,
- It show different experimental works, from which student benefit a lot,
- It decrease knowledge gaps between students who learn with different teachers,
- It reduce time and energy used by the class room teacher,
- It create multiple means of presentation,
- It covers vast portion with in short time,
- It is suitable to represent pictures, complex diagrams, Laboratory works etc. ,
- It introduces different ways of teaching methods convenient to active learners.

Even though, the number of teacher respondents that preferred traditional method of instruction was very few, they have forwarded the following reasons for their preference to traditional way of teaching.

- It lets classroom teacher enough time to contact with students,
- It lets to give appropriate number of class work and home work , and to provide their answer,
- It encourages to solve different problems (in the case of Mathematics subject) with students,
- It help to facilitate active learning,
- It is convenient to all types of learners (slow, medium and active learners),
- It encourage two ways of communication.

On the other hand, majority of students (i.e. about 65.26%) preferred Traditional method of instruction. And only 19.05% of student respondents preferred Plasma TV instruction. From this

statistical data, substantial number of student respondents preferred traditional method of instruction. In this regard, considerable number of student respondents listed the following points for their preference of traditional teacher based instruction:-

- Class room teachers repeats those unclear points during the course of instruction,
- Class room teachers teach with moderate pace,
- The class room teachers can understand individual difference with in the class room,
- It encourages student to ask those un clear points during the course of instruction,

Z-Test for Examining Students Achievements Before and After Plasma TV Intervention

This part deals with presentation of Z- test to examine the existence of significant differences on the achievements of student before and after the intervention of Plasma TV instruction.

Table 26: Z- test for the existence of significant variation before and after PTI on Chemistry subject

N_1	N_2	P_1	P_2	σp_1-p_2	Z_{ob}	Z_{cr}
16,868	19,021	4.00	12.82	42.64	-31.5	-1.96

N_1: Total Population of students who sit for exam before PTI
N_2: Total Population of students who sit for exam after PTI
P_1: Population percentage before PTI
P_2: Population percentage after PTI
σp_1-p_2: Standard deviation betewenP_1 andP_2
Z_{ob}: t- observed, Z_{cr}: t- critical

H_O: There is no significant difference on chemistry subject students' result in EGSECE before and after the intervention of Plasma TV instruction.

H_1: There is significant difference on chemistry subject students' result in EGSECE before and after the intervention of Plasma TV instruction.

H_O:$\mu_1 = \mu_2$

H_1: $\mu_1 \# \mu_2$

As shown in Table 26, the calculated value, (i.e.-31.5), at 0.05 a significant level with Z-test is many times less than the critical value (i.e. -1.96) therefore; there exist significant difference on student achievement at chemistry subject before and after the intervention of Plasma TV instruction.

The rate of progress of students' result in Chemistry subject after the intervention of Plasma TV instruction can be identified from the following table and line graph.

Table27: Students' Result at Chemistry Subject in EGSECE before and after Plasma TV Intervention

YEAR	2002/2003	2003/2004	2004/2005	2005/2006
% ≥ C	2.125	5.745	6.03	18.91
% < C	97.875	94.255	93.97	81.09

Fig-1 STUDENTS' RESULT AT CHEMISTRY SUBJECT IN EGSECE BEFORE AND AFTER PLASMA TV INTERVENTION

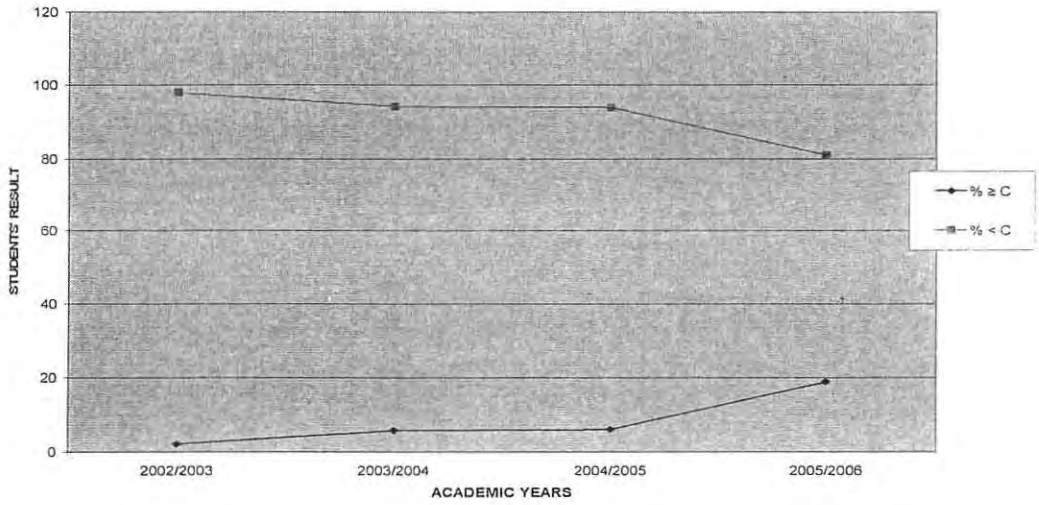


Table 28: Z- test for the existence of significant variation before and after PTI on Biology subject

N_1	N_2	P_1	P_2	$\sigma p_1\text{-}p_2$	Z_{ob}	Z_{cr}
16,868	19,021	6.31	9.61	0.28	-11.78	-1.645

H_O: There is no significant difference on Biology subject students' result in EGSECE before and after the intervention of Plasma TV instruction.

H_1: There is significant difference on Biology subject students' result in EGSECE before and after the intervention of Plasma TV instruction.

$H_O: \mu_1 = \mu_2$

$H_1: \mu_1 \# \mu_2$

As illustrated in Table 28, the calculated value, (i.e. -11.78), at 0.05 significant level with Z-test is many times less than the critical value (i.e. -1.96). Therefore, there exists significant difference on student achievement at Biology subject before and after the intervention of Plasma TV instruction. The rate of progress of students' result in Biology subject after the intervention of Plasma TV instruction can be identified from the following table and line graph.

Table29: Students' Result at Biology Subject in EGSECE before and after Plasma TV Intervention

YEAR	2002/2003	2003/2004	2004/2005	2005/2006
% ≥ C	6.965	6.06	8.55	10.525
% < C	93.035	93.94	91.45	89.475

Fig2 STUDENTS' RESULT AT BIOLOGY SUBJECT IN EGSECE BEFORE AND AFTER PLASMA TV INTERVENTION

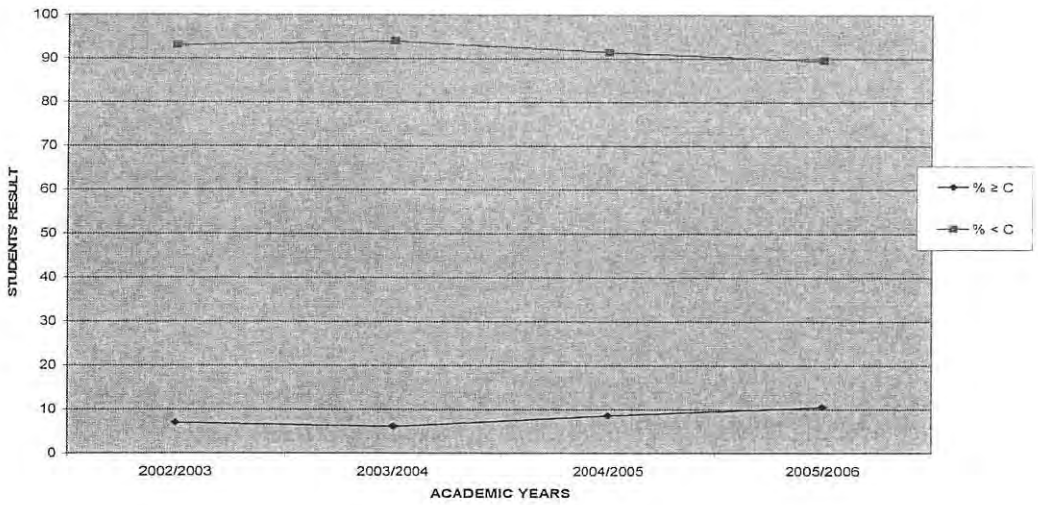


Table 30: Z- Test for the existence of significant variation before and after PTI on Physics subject

N_1	N_2	P_1	P_2	σp_1-p_2	t_{ob}	t_{cr}
16,868	19,021	4.49	10.16	0.30	-18.9	-1.96

H_O: There is no significant difference on Physics subject students' result in EGSECE before and after the intervention of Plasma TV instruction.

H_1: There is significant difference on Physics subject students' result in EGSECE before and after the intervention of Plasma TV instruction.

H_O:$\mu_1 = \mu_2$

H_1: $\mu_1 \# \mu_2$

As presented in Table 30, the calculated value, (i.e. -18.9), at 0.05 significant level with Z-test is many times less than the critical value (i.e. -1.96). Therefore, there exists significant difference on student achievement at Physics subject before and after the intervention of Plasma TV instruction. The rate of progress of students' result in Physics subject after the intervention of Plasma TV instruction can be identified from the following table and line graph.

Table31: Students' Result at Physics Subject in EGSECE before and after Plasma TV Intervention

YEAR	2002/2003	2003/2004	2004/2005	2005/2006
% ≥ C	2.78	6.215	7.605	12.495
% < C	97.22	93.785	92.395	87.505

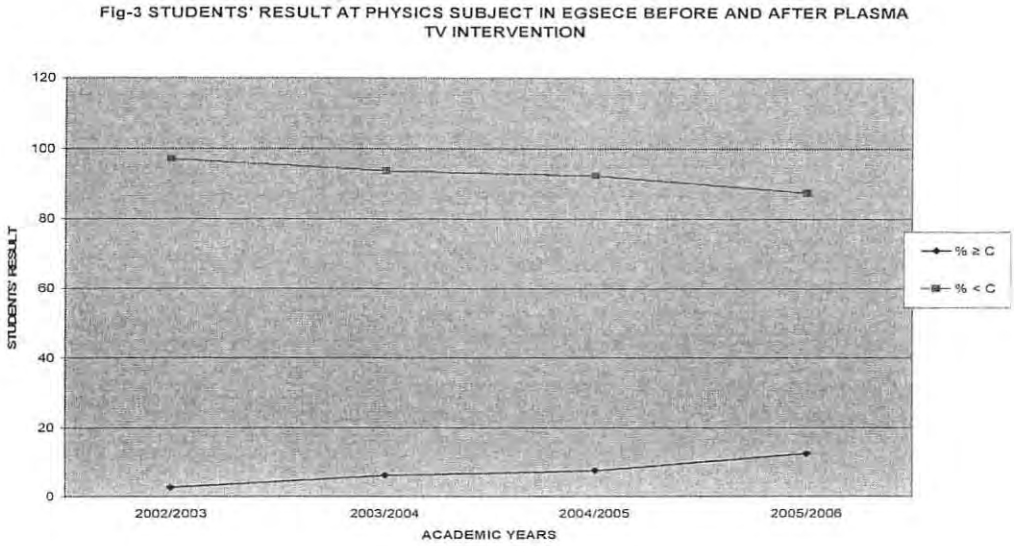


Table 32: Z- Test for the existence of significant variation before and after PTI on Mathematics subject

N_1	N_2	P_1	P_2	σp_1-p_2	t_{ob}	t_{cr}
16,868	19,021	4.25	8.30	0.24	-16.875	-1.96

H_O: There is no significant difference on Mathematics subject students' result in EGSECE before and after the intervention of Plasma TV instruction.

H_1: There is significant difference on Mathematics subject students' result in EGSECE before and after the intervention of Plasma TV instruction.

H_O:$\mu_1 = \mu_2$

H_1: $\mu_1 \# \mu_2$

As depicted in Table 32, the calculated value, (i.e. -16.875) at 0.05 significant levels with Z-test is many times less than the critical value (i.e. -1.96). Therefore, there exists significant difference on

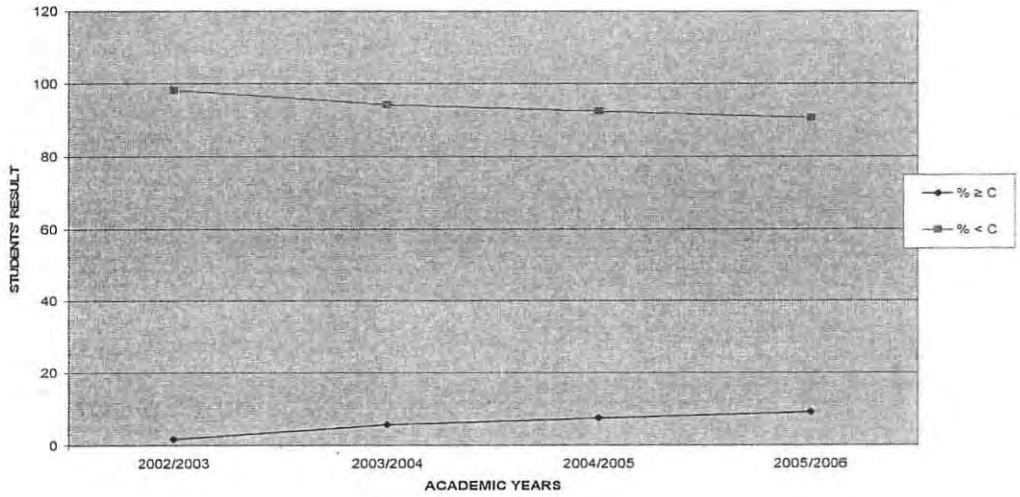
student achievement at Mathematics subject before and after the intervention of Plasma TV instruction.

The rate of progress of students' result in Mathematics subject after the intervention of Plasma TV instruction can be identified from the following table and line graph.

Table33: Students' Result at Mathematics Subject in EGSECE before and after Plasma TV Intervention

YEAR	2002/2003	2003/2004	2004/2005	2005/2006
% ≥ C	1.74	5.66	7.47	9.18
% < C	98.26	94.34	92.53	90.82

Fig-4 STUDENTS' RESULT AT MATHEMATICS SUBJECT IN EGSECE BEFORE AND AFTER PLASMA TV INTERVENTION



CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Summary and Findings

The study was aimed at investigating the progress that has been brought about by the intervention of Plasma TV instruction as compared to the traditional teacher based instruction.

The following basic questions were formulated for the comparison of the traditional based instruction and Plasma TV instruction.

1. What were the major problems encountered while conducting the instructional process with the traditional teacher based instruction?
2. What are the gaps that have been filled by the introduction of the Plasma TV instruction in improving students' results in EGSEC National Examination?
3. What are the limitations of Plasma TV instruction in improving students' results in EGSEC National Examination?
4. What changes are observed in the learning activities of students due to the introduction of Plasma TV instruction?
5. Which method of instruction is preferred by students' and teachers so as to improve students' result in EGSEC Examination?
6. Is there significant difference between teacher based instruction and Plasma TV instruction in improving students' result in EGSEC Examination?

The subject for the study were 532 Grade ten students, out of which 272 (51.13%) were females and 260 (48.87%) were males, and forty-one teachers who have taught grade ten since 2002/2003 two years before the introduction of Plasma TV instruction at, Biology, Chemistry Mathematics and Physics subjects. In addition to the students and teachers, five school principals and five sub-city science supervisors were also included. Questionnaire, Interview and Field observations were used as instrument in this study, Furthermore; secondary data that were obtained from NOE are used as a source of information.

From the data collected, the sample frequency distributions descriptive statistics, chi- square test and Z-test were employed. The result of the data was presented using tables and line graphs.

From the analysis the following results were obtained:

1. About 82.92%of the work load of teachers before the introduction of the satellite TV was in the range of 16 to 25 periods, and the work load of teachers after the introduction of the satellite TV also account about 86.11% of the total respondents. This indicates that there is no as such a significant variation on work load of teachers before and after the introduction of the Plasma TV instruction.

2. 436(87.55%) student respondents learned with Plasma TV instruction for two years. This shows that most of the students have experience to suggest on the merit and demerit of Plasma TV instruction as compared to their traditional teacher based instruction.

3. Majority of teachers (i.e.73.18%, 75.05%, and70.73%) and students (i.e. 57.83 %, 80.72%, and 58.63%) respondents showed their agreement on items related to problems of inputs for the teaching learning process of Traditional class room teacher based instruction. The mean rating value of teacher (i.e. 3.76, 4.10 and 3.71) and the mean rating value of student respondents (i.e. 3.61, 4.23 and3.51) were greater than the expected average. The result of Chi-square test (i.e.X^2=12.05, 11.7, 16.99 for item one, two and three respectively with df =4, p=0.05), are all greater than the critical value (i.e.9.49).Thus, from Chi-square test, the rating pattern of the respondents showed significant difference in all these three items;

- Un availability of qualified teachers with the required numbers,
- Lack of science laboratory with the required standards,
- Lack of utilizing varied and diverse Curriculum materials other than traditional text resources, as problems of traditional teacher based instruction.

Thus, the agreement level of teacher respondent on items one and three are substantially greater than that of student respondents. On the other hand, the agreement level of student respondents on the second item is greater than that of teacher respondents.

4. The attitude of teachers and student respondents, showed some difference on items related with Problems of Traditional teacher based instruction related to the teaching learning activities that are stated as:-

- Traditional way of instruction does not encourage active learning.
- Difficulty to bring all kind of necessary information in to the class room.
- Traditional way of instruction does not make students problem solver and critical thinkers.

The mean rating value of teacher respondents for the first and second items (i.e.3.20and 3.80) are greater than the expected average. Concomitantly the mean rating value of teacher respondents for the third item (i.e.2.97) is less than the expected average. On the other hand the mean rating value of the first item for the student respondents (i.e.2.94) is less than the expected average. However, the mean rating value of the second and third items of student respondents (i.e.3.97 and 3.26) are greater than the expected average.

The result of Chi-square test for the second item(i.e.11.62) is greater than the critical value (i.e.9.49).However, the test value for first and third items(i.e.4.83 and 6.96)are less than the critical value with df=4 and p value 0.05. Therefore, from Chi-square test and mean rating values it is possible to deduce that, the rating pattern of the respondents showed significant difference on one out of three items listed as problem of traditional teacher based instruction related with the teaching learning activities. Thus, the majority of the respondents to the following item appeared to the agreement scale.

- Traditional way of instruction does not encourage active learning
- Traditional way of instruction does not make students problem solver and critical thinkers

Regarding the remaining one item, the test value is greater than the critical value. As a result, although, the responses pattern revealed differences, it was not statistically significant at 0.05 alpha level.

5. Teachers and students showed their strong agreement on items related with problems of efficiency, access and quality of the teaching learning process during traditional teacher based instruction. The mean rating value of teacher respondents (i.e.3.56, 3.46 and 3.94) and student respondents (i.e. 3.39, 3.56 and 3.94) are all greater than the expected average. Moreover, the result of Chi-square test (i.e.1.51, 5.86 and7.88) are all less than the critical value (i.e.9.49 with df=4 and p value 0.05)

Therefore, from Chi-square test and mean rating values, it is possible to deduce that, the rating pattern of the respondents showed no significant difference on all these three items listed as problem of traditional teacher based instruction related with the teaching learning activities. Thus, the majority of the respondents to the following item appeared to the agreement scale.

- Problem of efficiency in education.
- Problem of quality in education.
- Problem of access of different materials that assist the teaching learning process as problems of traditional teacher based instruction.

Majority of School Principals and Sub-City science Supervisors also stated; Language problem, problem in portion coverage with in limited school calendar, lack of qualified teachers, difference in language ability, skills and approach among teachers, students back ground difference to cope with the new curriculum, non-uniform distribution and lack of facilities of teaching materials, like Laboratories, Pedagogical centers, etc, difficulty to manage large number of students in a class, time constraint, especially for the Laboratory practice, difficulty to bring some ideas in to observable objects (in the form of images) and high teaching load as problems of traditional teacher based instruction.

6. Students and teachers had disagreement on items that are assumed to be advantage of Plasma TV instruction over teacher based instruction for teachers. Which are stated as:-

- Class room teachers have sufficient time to assess the performance of their students.
- The class rooms teachers has better chance to acquaint himself for his students, and
- The class room teachers have leisure time to improve students' achievement.

The mean rating value of the first, second and third items of teacher respondents (i.e.2.56, 2.61, and2.78) and student respondents (i.e.2.69, 2.30 and 2.68) are less than the expected average. Moreover, the Chi-square test result (i.e.18.18, 11.66and34.68) for the second third and forth items are all greater than the critical value (i.e.9.49) with df=4 and p value 0.05. This indicates that there is statistically significant difference in the responses pattern of teacher and student respondents on items:-

- During Plasma TV instruction class room teachers have sufficient time to assess the performance of their students,
- The class room teacher has better chance to acquaint himself with his students.
- The class room teacher has leisure time to improve students' achievement. As advantage of Plasma TV instruction.

On the other hand, majority of teacher respondents (i.e.87.81%) and student respondents (i.e.78.31%) agreed with the statement:-

- The introduction of Plasma TV instruction reduces the burden of the class room teachers, as an advantage of Plasma TV instruction.

7. On the advantage of Plasma TV Instruction over teacher based instruction for students, the mean rating value of teacher respondents for the first, second, and fourth items (i.e. 3.07, 3.05 and 4.05) and the mean rating value of student respondents (i.e.3.06, 3.13and3.61) respectively are greater than the expected average. On the other hand, the mean rating value of teacher respondents (i.e.2.17) and student respondents (i.e.2.58) on the third item is less than the expected average (i.e.3.00).

Besides, Chi-square test result for the third and fourth items (i.e.9.87 and22.43) are greater than the critical value (i.e.9.49) with df=4 and p value 0.05. From the above statistical data the rating pattern of the respondents showed significant difference on two out of the four items that are assumed to be advantage of plasma TV instruction over teacher based instruction for students. That is, the majority of teacher and student respondents to the following items appeared towards the disagreement scale:-

- Plasma TV instruction helps student to be active participant in the teaching learning process.

- Plasma TV instruction encourages students to be creative and problem solver.

As regard the remaining two items, teacher respondents strongly disagreed on item,

- Plasma TV instruction consider student understanding difference.

On the other hand, majority of student respondents to the following item appeared towards the agreement scale.

- Students benefit a lot from the demonstration of different experiments from the Plasma TV instruction.

8. On the point of advantage of Plasma TV Instruction over teacher based instruction for the teaching learning process, the mean rating value of teacher respondents (i.e.3.08, 3.29 and 3.34) for items:- introduction of Plasma TV instruction makes teaching learning process more student centered, Plasma TV instruction creates conducive atmosphere in the teaching learning process and the class room discipline becomes better and better after the introduction of Plasma TV instruction, are greater than the expected average. On the other hand the mean rating value of student respondents for item, introduction of Plasma TV instruction makes teaching learning process more students centered (i.e.3.15) is greater than the expected average. However, the mean rating value for items Plasma TV instruction creates conducive atmosphere in the teaching learning process and the class room discipline becomes better and better after the introduction of Plasma TV instruction (i.e.2.60and 2.30) are less than the expected average.

Moreover, the result of Chi-square test for the first second and third items (i.e.16.4, 18.72 and29.37) are all greater than the critical value (i.e.9.49 with df=4 and p value0.05).

From the above statistical data, the rating pattern of teacher and student respondents showed significance difference on all of these three items.

- The introduction of Plasma TV instruction makes teaching learning process more students centered.
- Plasma TV instruction creates conducive atmosphere in the teaching learning process.
- The class room Discipline becomes better and better after the introduction of Plasma TV instruction.

Thus, majority of student respondents appeared towards an agreement scale while, majority of teacher respondents appeared towards a disagreement scale for the following item:-

- The introduction of Plasma TV instruction makes teaching learning process more students centered.

On the other hand, majority of student respondents appeared towards the disagreement scale while, majority of teacher respondents appeared towards an agreement scale for the following items:-

- Plasma TV instruction creates conducive atmosphere in the teaching learning process.
- The class room Discipline becomes better and better after the introduction of Plasma TV instruction.

9. For the advantage of Plasma TV instruction over teacher based instruction related with portion coverage and method of teaching:- the mean rating value of teacher respondents on items, Plasma TV instruction helps to cover the whole portion at the end of the semester and the Plasma TV instructions cover all important portions of students text books (i.e.4.3 and3.95) are above the expected average. While, the mean rating value for item, Plasma TV instruction utilizes different methods of teaching. (i.e.2.95) is less than the expected average. On the other hand, the mean rating value of student respondents for all those three items (i.e.3.61, 3.60 and 3.91) are greater than the expected average.

Moreover, the result of Chi-square test for the first second and third items (i.e.14.56, 10.73 and32.08) are greater than the critical value (i.e.9.49 with df=4 and p value0.05).

From the above statistical data the rating pattern of teacher and student respondents showed significant difference on all of these three items with 0.05 levels of significance. That is, the majority of teacher respondents agreed on items:-

- The Plasma TV instruction helps to cover the whole portion at the end of the semester.
- The Plasma TV instructions cover all important portions of student's text books.

To the contrary, majority of teacher respondents appeared towards the disagreement scale for the following item:-

- Plasma TV instruction utilizes different methods of teaching.

On the other hand, majority of student respondents appeared towards the agreement scales for the following items.

- The Plasma TV instruction helps to cover the whole portion at the end of the semester.
- The Plasma TV instructions cover all important portions of students' text books.
- Plasma TV instruction utilizes different methods of teaching.

10. The result for the advantage of Plasma TV Instruction over teacher based instruction related to students academic achievement indicated that, the mean rating value of teacher respondents (i.e.2.78 and2.67) and student respondents (i.e.2.12 and 2.20) for items, Plasma TV instruction improves academic achievement of students and Plasma TV instruction prepare students better for their National Examination than traditional teacher based instruction are less than the expected average.

Moreover, the result of Chi-square test for the first and second items (i.e.12.94 and13.59) are greater than the critical value (i.e.9.49 with df=4 and p value0.05).

Therefore, the rating pattern of teacher and student respondents showed significant difference on items:-

- Plasma TV instruction improve academic achievement of students.
- Plasma TV instruction prepare students better for their National Examination, than teacher based instruction.

A number of advantages were also stated by principals and sub-city science supervisors. Some of the major ones are:-

- Since, most of the theories are supported by animation, relatively it arose students to attained the class attentively,
- It helps to cover vast portion with short period of time,
- It helps to provide uniform teaching materials and methodology for all students,
- It improves the language skills of students,
- It minimizes the full occupation of teachers in all aspects of teaching learning process, and maximizes the participation of students,

- It helps to bring in class real life situations,
- It provides standardized and well prepared demonstration.

11. From the responses of both teachers and student respondents on limitation of Plasma TV instruction related to its Instructional Process; the mean rating value of teacher respondents (i.e.4.17, 4.05, 4.18 and 3.46) for items, Plasma TV instruction lacks the eliciting of desire responses from the learner, Plasma TV instruction lacks assessment of student performance, Plasma TV instruction lacks feed back on the past performance of the student and Plasma TV instruction lacks selection of appropriates mode of instruction, are substantially greater than the expected average. Similarly the mean rating value of student respondents for the first, second and fourth items (i.e.3.49, 3.39 and 3.10) are all above the expected average.
Furthermore, the result of Chi-square test for the first second, third and fourth items (i.e.19.79, 16.59, 31.74 and11.24) are all greater than the critical value (i.e.9.49 with df=4 and p value0.05).

Therefore, from the above statistical data the rating pattern of teacher and student respondents, showed significant difference on all items with 0.05 levels of significance. That is, majority of teacher respondents agreed on items Plasma TV instruction lacks: -

- The eliciting (draw out) of desire responses from the learner,
- Assessment of student performance,
- Feed back on the past performance of the students,
- Selection of appropriates mode of instruction, as major limitation of Plasma TV instruction.

While, majority of student respondents agreed on items Plasma TV instruction lacks: -

- The eliciting (draw out) of desire responses from the learner,
- Assessment of student performance,
- Selection of appropriates mode of instruction, as major limitation of Plasma TV instruction.

12. Related to the limitation of Plasma TV instruction in class room control and motivation, the mean rating value of teacher respondents (i.e.3.95, 3.54 and 3.54) and student respondents (i.e.3.29, 3.32 and 3.19) for items, Plasma TV instruction lacks taking the appropriate adjusted action, Plasma TV instruction lacks class room motivation, Plasma TV instruction lacks class room control, are substantially greater than the expected average. Therefore, it is possible to infer

that majority of teacher and student respondents to the following three items appeared toward the agreement (strongly agree plus agree) scale. Plasma TV instruction lacks;

- Taking the appropriate adjusted action,
- Class room motivation,
- Class room control, as limitations of Plasma TV instruction.

13. The mean rating values of both teacher respondents (i.e.3.36, 3.02 and 4.13) and student respondents (i.e.3.38, 3.31 and 3.86) on limitation of Plasma TV instruction related to administrative activities are all above the expected average for items; Failure at institutionalizing of the ICT program with in the school, Poor utilization of Plasma TV instruction according to its schedule, Disruption of transmition during instruction due to power failure or technical problems. Furthermore, the result of Chi-square test for the first second and third items (i.e.18.05, 10.3 and14.53) are all greater than the critical value (i.e.9.49 with df=4 and p value0.05).

Therefore, from the above statistical data the rating pattern of teacher and student respondents showed significant difference, with 0.05 levels of significance on items:-

- Failure at institutionalizing of the ICT program with in the school,
- Poor utilization of Plasma TV instruction according to its schedule,
- Disruption of transmition during instruction due to power failure or technical problems as limitations of Plasma TV instruction.

14. The mean rating value of teacher respondents (i.e.2.05, 2.50, 2.52 and 2.42) and student respondents (i.e.2.28, 2.38, 2.52 and 2.44) on changes that have been observed on the students as a result of Plasma TV instruction, are below the expected average for items; Students understand Plasma TV instruction better than the class room teachers, Student competition level increased after the introduction of the Plasma TV instruction than before it's intervention, Introduction of Plasma TV instruction encourage cooperative learning than the traditional way of teaching and Students' participation with in the class room increased after the introduction of Plasma TV instruction.

Furthermore, the result of Chi-square test for the first and third items (i.e.16.58 and 11.52) are greater than the critical value (i.e.9.49 with df=4 and p value0.05), While, the second and fourth items (i.e.7.82 and1.38) are less than the critical value.

Therefore, the rating pattern of the respondents showed significant difference on two out of four items on changes that have been observed as a result of Plasma TV instruction. That is, the majority of teacher and student respondents to the following items appeared towards the disagreement scale:-

- Student competition level increased after the introduction of the Plasma TV instruction than before its intervention.
- Students' participation with in the class room increased after the introduction of Plasma TV instruction.

As regard the remaining items (i.e. item 1 and item 3), although, the response patterns reveled differences, they were not statistically significant at 0.05 significance levels.

15. The mean rating value of teacher respondents (i.e. 2.35 and 2.45) and student respondents (i.e. 2.28 and 2.23) are below the expected mean average for items; Students use their exercise books properly after the introduction of Plasma TV instruction than before its intervention and Students are encouraged to do their home work and class work after the introduction of Plasma TV instruction.

Moreover, the result of Chi-square test for the first item (i.e.9.82) is greater than the critical value (i.e.9.49 with df=4 and p value0.05), While the second item (i.e.6.95) is less than the critical value. These statistical data confirm that, the rating pattern of respondents showed significant difference on one out of two items of changes that have been observed as a result of Plasma TV instruction. That is, the majority of teacher and student respondents to the following item appeared towards the disagreements scale:-

- Students are encouraged to do their home work and class work after the introduction of Plasma TV instruction.

As regard the remaining item (i.e. item1) although, the response patterns revealed differences; it was not statistically significant at 0.05 significance level.

16. Significant number of teacher respondents (i.e. 85.00%, 70.00% and 65.00%) and student respondents (i.e. 74.30%, 68.88% and 76.50%) disagreed on items, students have sufficient time to ask unclear points during the Plasma TV instruction, students have sufficient time to ask unclear points after the Plasma TV instruction and the pace of the Plasma TV instruction is comfortable to students to follow up the lesson. The mean rating value of teacher respondents (i.e. 1.87, 2.26 and 2.43) and the mean rating value of student respondents (i.e. 2.04, 2.20 and 1.87) are less than the expected average.

In addition, the result of Chi-square test for the first second and third items (i.e.9.55, 12.47 and 23.09) are all greater than the critical value (i.e.9.49 with df=4 and p value0.05). From the percentage, mean rating value and the result of Chi-square test the rating pattern of teacher and student respondents showed significant difference on all of these three items.

- Students have sufficient time to ask unclear points during the Plasma TV instruction,
- Students have sufficient time to ask unclear points after the Plasma TV instruction,
- The pace of the Plasma TV instruction is comfortable to students to follow up the lesson.

That is, the degree of disagreement of teacher respondents for the first and second items was substantially greater than that of student respondents. While, on the third item the degree of disagreement of student respondents is greater than that of teacher respondents.

17. The mean rating value of teacher respondent for items, teaching with Plasma TV instruction is inconvenient to slow learners and medium learners (i.e. 1.97 and 2.85) are less than the expected average (i.e. 3.00). However, the mean rating value of teacher respondents (i.e. 3.55) for item, teaching with Plasma TV instruction is inconvenient to fast learner is above the expected average. Similarly, the mean rating value of student respondents for item one and two (i.e. 2.19 and 2.75) are less than the expected average. On the other hand, the mean rating value of student respondents for the third item (i.e. 3.49) is above the expected average.

Besides, the result of Chi-square test for the first and second items (i.e.12and 24.44) are greater than the critical value (i.e.9.49 with df=4 and p value0.05), while, the test value for the third item (i.e. 9.25) is less than the critical value.

Therefore, the rating pattern of the respondents showed significant difference on two out of three items, of changes that have been observed as a result of Plasma TV instructions. That is, the

majority of teacher and student respondents to the following items appeared towards the disagreement scale:-

- Teaching with Plasma TV instruction is inconvenient to fast learner.

As regards to the first and second items, although, the responses patterns revealed differences, they were not statistically significant at 0.05 significance levels.

That is, the degree of agreement of teacher respondents for the first and second items was substantially greater than that of student respondents.

18. Related to items that deal with, measures that need to be taken to make the Plasma TV instruction more effective, the mean rating value of teacher respondents (i.e. 3.60 and 4.02) and the mean rating value of student respondents (i.e. 4.22 and 4.23) are substantially above the expected average (i.e. 3.00). From these statistical descriptions both students and teachers had strong agreement level on the statements:-

- Increasing contact hour of the class room Teachers,
- Adjusting the rate of the Plasma TV instruction, as measures that need to be taken to make the Plasma TV instruction more effective.

19. Related to items on administrative measures, those need to be taken to make the Plasma TV instruction more effective; 70.00%, 82.50%, and 77.50% of teacher respondents and 84.13%, 67.27% and 71.27% of student respondents were agreed on items; preparing planed tutorial program for each subject, using Plasma TV instruction as supplementary instructional method by class room teachers and decreasing the present number of students, per class below fifty. Moreover, the mean rating value of teacher respondents (i.e. 3.65, 4.10 and4.07) and the mean rating value of student respondents (i.e. 4.25, 3.83 and 3.97) are all above the expected average. Therefore, there was strong agreement among student and teacher respondents on the following items:-

- Preparing planed tutorial program for each subject,
- Using Plasma TV instruction as supplementary instructional method by class room teachers.
- Decreasing the present number of students, per class below fifty,

Furthermore, on items that are related to administrative measures that need to be taken to make the Plasma TV instruction more effective, 77.50%, 85.00% and 75.00% of teacher respondents and

79.10%, 70.68% and 80.72% of student respondents were agreed on items, providing the Plasma TV instruction Guide for the students with sufficient copies, providing the Plasma TV instruction Guide for teachers with sufficient copies and establishing a responsible body at the sub-city level or school level, so as to follow up the effectiveness of Plasma TV instruction, the mean rating values of teacher respondents (i.e. 3.87, 4.17 and 3.87) and the mean rating values of student respondents (i.e. 4.15, 3.88 and 4.12) are substantially greater than the expected average(i.e. 3.00). Therefore,

- Providing the Plasma TV instruction Guide for the students and teachers with Sufficient copies,
- Establishing a responsible body at the sub-city level, so as to follow up the effectiveness of Plasma TV instruction, are points that have reached strong agreement among student and teacher respondents, as measures that need to be taken to make the Plasma TV instruction more effective.

20. On items that are associated to measures that need to be taken to make the Plasma TV instruction more effective in related to training, about 77.50% and 75.00% of teacher respondents and 79.71% and 79.71% of student respondents agreed. The mean rating value of teacher respondents (i.e. 3.97 and 3.92) and the mean rating value of student respondents (i.e. 4.18 and 4.15) are substantially above the expected average (i.e. 3.00). From those statistical descriptions:-

- Providing necessary training for the class room teacher,
- Providing the necessary training for the student how to learn from the Plasma TV instruction, are measures that need to be taken to make the plasma TV instruction more effective.

21. On points related to preferred instructional methods, about 20.00% of teacher respondents preferred 'Traditional method of instruction'. On the other hand, majority of teacher respondents (i.e. about 50.00%) preferred' Plasma TV instruction'. The remaining 30.00% preferred an integrated method of instruction. Majority of students (i.e. about 65.26%) preferred Traditional method of instruction. And only 19.05% of student respondents preferred Plasma TV instruction. From this statistical data, substantial number of student respondents preferred traditional method of instruction while, majority number of teachers preferred plasma TV instruction.

22. The calculated z- value, -31.5, at 0.05 significant levels, with z-test is many times less than the critical value (i.e. -1.96). Therefore, there exists significant difference on student achievement at chemistry subject before and after the intervention of Plasma TV instruction.

23. The calculated z- value, -11.78, at 0.05 significant levels with z-test is many times less than the critical value (i.e. -1.96). Therefore, there exists significant difference on student achievement at Biology subject before and after the intervention of Plasma TV instruction.

24. The calculated z- value, -18.9, at 0.05 significant levels with z-test is many times less than the critical value (i.e. -1.96). Therefore, there exists significant difference on student achievement at Physics subject before and after the intervention of Plasma TV instruction.

25. The calculated z- value, -16.875, at 0.05 significant levels with z-test is many times less than the critical value (i.e. -1.96). Therefore there exists significant difference on student achievement at Mathematics subject before and after the intervention of Plasma TV instruction.

5.2. CONCLUSIONS

Based on the finding of the study, the following conclusions are made.

1. There were a number of reasons set by the government to introduce the Plasma TV instruction in to the secondary schools of the country. The effectiveness of the Traditional teaching learning process in terms of efficiency, quality and access are the major once. Teacher and student respondents also expressed strong agreements on unavailability of qualified teachers with the required numbers, lack of science laboratory with the required standards, lack of utilizing a varied and diverse curriculum other than traditional text resources, difficulty to bring all kind of necessary information in to the class room as problems of teacher based instruction.

Moreover, majority of School Principals and Sub-City science Supervisors stated the following additional points such as, problem in portion coverage with in limited school calendar, Lack of qualified teachers with the required number, difference in language ability, skills and approach among teachers, student back ground difference to cope up with the new curriculum, non-uniform distribution and Lack of facilities of teaching materials, like Laboratories, Pedagogical centers, etc, discipline problems, difficulty to manage large number of students in a class, time constraint, especially for the Laboratory practice, difficulty to bring some ideas in to observable objects (in the form of images), high teaching load as problems of traditional teacher based instruction.
Therefore, there were a number of reasons that the teacher centered delivery of instruction was not adequate to prepare students for the future, and a need to look at different alternatives so as to improve students' achievement level.

2. Several research findings show that the investment of time, training and resources on educational Technology has brought in tremendous benefits in terms of student achievement.
Moreover, educational gains through technology were cost-effective and increased socio-economic and gender equity. However, in Addis Ababa secondary schools, the class room teachers lack sufficient time to assess the performance of their students and to do several other activities in the teaching learning process and the Plasma TV instruction does not consider student understanding difference, due to those points Plasma TV instruction did not prepared students better for their National Examination, than teacher based instruction as it was expected.

Despite of, the above facts Students benefit a lot from the demonstration of different experiments from the Plasma TV instructions, the Plasma TV instruction helps to cover all important and the whole portion of student's text books at the end of the semester that contribute for the improvement of students result in National Examination as compared to Traditional teacher based instruction.

There was also opinion difference among teacher and student respondents on some items to take as advantage of Plasma TV instruction. For instance majority of teachers agreed on,
Plasma TV instruction creates conducive atmosphere in the teaching learning process, and the class room discipline becomes better and better after the introduction of Plasma TV instruction. To the contrary student respondents showed their disagreement to those items.
Thus, even though, Plasma TV instruction has a number of valuable advantages due to its limitation to understand students' academic ability difference and minimizing the role of the class room teachers it fails to bring the necessary improvement on students result in National Examination.

3. Several research findings identified three basic problems in applying the new technology. These are cost, technical problems (skilled man power capable of managing networks and other maintenance) and problem of selecting reliable information on the network, which are compatible to the current conditions of the secondary schools and the learners understanding difference. The current Plasma TV instruction in Addis Ababa secondary schools also faced the following problems:-
Lack of the eliciting (draw out) of desirable responses from the learners, lack of assessment on students performance, lack of feed back on the past performance of the students, lack of selection of appropriates mode of instruction, be deficient in taking the appropriate adjusted action, lacks class room motivation, lacks class room control, Failure at institutionalizing the ICT program with in the school, Poor utilization of Plasma TV instruction according to its schedule, interruption of transmition during instruction due to power failure and technical problems are major limitation of Plasma TV instruction.

Though, millions of 'birr' were expended on new Technology for education, the result was not as expected. As indicated in many research articles the problems with school that tried to integrate the new Technology with their curriculum was not just having the Plasma TV, but having access

to the Plasma TV instruction as valuable teaching and learning tools. The schools did not realize much the fact that technology alone would not change education. They tried to develop a system with out a person who knew at least about the operation of the Plasma TV.

4. Technology tools and resources must integrate into the curriculum to achieve clear, measurable educational objectives of both the teaching and learning process if they are to have an impact on student achievement. However, in Addis Ababa secondary schools, students do not understand Plasma TV instruction better than the class room teachers, Introduction of Plasma TV instruction does not encourage cooperative learning than the traditional way of teaching, Students do not use their exercise books properly after the introduction of Plasma TV instruction than before its intervention, students do not have sufficient time to ask unclear points during and after the Plasma TV instruction, the pace of the Plasma TV instruction is not comfortable to students to follow up the lesson. Moreover, teaching with Plasma TV instruction is inconvenient to slow learners and medium learners.

Thus, the plasma TV instruction did not bring the necessary change as expected by teachers and students.

5. Majority of student preferred to learn chemistry subject with Plasma TV instruction, while a significant number of student preferred to learn mathematics with traditional teacher instruction. These finding results indicate that subjects that require calculations need to have sufficient time for practice.

6. Research findings indicate that Educational technology has a significant positive effect on achievement. Positive effects have been found for all major subject areas, in preschool through higher education, and for both regular education and special needs students. In Addis Ababa secondary schools also, there exists significant difference on students' result in EGSECE at Chemistry, Biology, Physics and Mathematics subjects before and after the intervention of Plasma TV instruction.

5.3 RECOMMENDATIONS

In the light of the findings of the study, the following recommendations are forwarded to improve the effectiveness of Plasma TV instruction in particular and students' result in EGSECE in general.

1. From the result of the findings majority of students do not prefer to learn Mathematics with Plasma TV instruction as compared to the other subjects. Any given instructional strategy can be supported by a number of constructing Technologies (old and new). However, providing the whole instruction with Plasma TV does not help to improve students' results. Therefore, there must be a way to integrate the class room teacher effort with that of Plasma TV instruction, by giving chance for the class room teachers' to have the lion's share of the instructional process in subjects that have more calculations like mathematics and physics. It is better to turn a screw with a screw driver than a Hammer. A Hammer may do the trick but screw driver is usually better than the Hammer.

2. Educational Technology has a significant positive impact on achievement on different subject areas, across all levels of schools. However, one problem for the effectiveness of the Plasma TV instruction, in its current practice is the presence of large number of students in each class. In Addis Ababa secondary schools there are more than seventy students in each class. This creates trouble for the class room teacher to follow up each and every student whether they are followed the lesson properly or not. To reduce the current number of students to the standard set by MOE (i.e. 50 students per class), School Directors, education bureau officials and the society should work together to continue the already started expansions of schools until the number of the student is reduced to the standard set by MOE.

3. Because of its incompatible speed, students' are struggling to copy note from the Plasma TV instruction. This makes for the majority of the students, learning from the Plasma TV instruction boring and difficult. To alleviate this problem schools should need to prepare both hard and soft copies of Plasma TV teachers Guide with sufficient copies for both teachers and students Moreover, EMA need to give special consideration to the speed of Plasma TV instruction, so as students can attentively follow up the lesson with out any stress.

4. One strong barrier for the effectiveness of the Plasma TV instruction is lack of proper training for both students and teachers. Teachers can not be expected to become skilled at to use the Plasma TV instruction after a one- time work shop. To effectively utilize the Plasma TV instruction, it is vital providing adequate training, mentoring, access and technical supports, as a result of this teachers tend to be more willing to move to the next place at which they becomes co learners and co explorer. Therefore, the necessary training should be provided for both teachers and students to increase the current condition of the Plasma TV instruction.
EMA can provide the necessary training either face to face or by use of the advantage of the Plasma TV.

5. The result of the findings indicates that the Plasma TV instruction is inconvenient to slow learners and, medium learners. From this it is possible to understand that, the Plasma TV instruction does not consider student understanding difference. If the given instructional process does not consider students understanding difference it fails to improve the result of the students. Therefore, EMA need to look at the lessons prepared so far, to make the instruction compatible to the different understanding level of the students. Moreover, the school administrator and teachers need to separately look at those students that require special attention so as to fill the gap that is created because of the Plasma TV instruction.

6. As EMA indicated, ICT is introduced, phase by phase. The first phase is introduction of the ICTs to the Secondary level, followed by the Primary and ultimately, for all learners, and the second phase, introduction of computers in schools (including CDs) (Demissew Bekele, 2006). In order to utilize the Plasma TV instruction according to the ability of students and the condition of the schools, EMA should make an effort to introduce the second phase as soon as possible.

7. The technical problems of the Plasma TV have increased time to time. Most of the Plasma TVs are unable to show the exact colour of pictures or experimental results. Moreover, instructions are disrupted ten or more times per a given instruction due to the absence of signals. This is another problem that decreases the effectiveness of the Plasma TV instruction and cause for the misbehavior of students during the instruction. To solve this problem EMA should train teachers who are responsible to institutionalize the result of the training in to the school, and there should be a strong follow up for the effectiveness of the institutionalization process. Moreover, there

should be sufficient amount of Plasma TV accessories in some center area so as to repair as soon as the problem occurs.

8. Even though, there is some progress on students' result in EGSECE, the effectiveness of Plasma TV instruction has been not as expected. This might be because of the absence of responsible bodies which follow up the effectiveness of the instruction process at the school level. To make it more effective the school should form the Plasma TV instruction planning team compromising administrators, teachers , other instructional staffs, technology coordinator, students, parents and representative of the community. This team first develops a clear set of goals, expectations and criteria for students learning using Plasma TV instruction, based on the school current condition and work as a responsible body to find out remedies for problems that can be addressed at least at the school level.

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APPENDICES

Appendix A1: Instrument for Teacher Respondents

Addis Ababa University
School of Graduate Studies
College of Education
Department of Educational Planning and Management

Questionnaire to be completed by Secondary School teachers in Addis Ababa.

Dear respected teachers,

This questionnaire is designed to solicit data for a Masters research entitled "A comparative study on teacher and plasma TV based instruction towards improving student National Examination result." The scope of the research is confined to make a comparative study on the practice of teacher-based instruction during 2002/3-2003/4 and during 2004/5-2005/6 after the introduction of plasma TV instruction towards improving student national examination result. The main purpose of the research is to identify the advantage and limitation of both methods of instruction towards improving student national examination result. And to investigate, whether, a significant achievement observed after the intervention of the plasma TV instruction. To this end, you are requested to express your opinion regarding the two methods of instruction. Your thoughtful responses to the questions are sought to be of great help to the success of this research. Therefore, please kindly extend your cooperation by frankly and honestly responding to the item contained in this questionnaire. Be sure that your response are kept in strict confidence and be used for academic purpose only.

THANK YOU IN ADVANCE FOR YOUR COOPERATION!

Note:

1. Please read each item carefully and record your genuine opinion on the basis of your experience in the teaching learning process
2. Please answer all questions in their order. And do not leave any item un answered.
3. There is no need to write your name or sign on the questionnaire.
4. Please return the completed questionnaire to the designated person.

PART ONE: GENERAL INFORMATION/ DEMOGRAPHIC DATA

The following are some background information to be filled by the respondent. Please go through each item and indicate your response by putting check mark "√ " or suitable words in the appropriate space provided.

Name of the school _____

1) Sex **A)** ☐ Male **B)** ☐ Female

2) Age **A)** ☐ from 20to 30 years
B) ☐ From 31 to 40 years
C) ☐ From 41 to 50 years
D) ☐ Above 50 years

3) Teaching Experience
A) ☐ 1 to 5 years
B) ☐ 6 to 10 years
C) ☐ 11 to 15 years
D) ☐ 16 to 20 years
E) ☐ 21 to 26 years
F) ☐ Above 26 years

4) Educational Qualification **A)** ☐ Diploma holder
B) ☐ BA/BSC holder
C) ☐MA/MSC holder
D) ☐Other (please specify) _____

5) Field of Study **A)** Major _____
B) Minor _____

6) Work load per week before the introduction of the satellite TV **A)**☐ 1to 10 **B)**☐ 11to 15 **C)** ☐ 16to 20 **D)**☐ 21to 25 **E)**☐ Above 25

7) Work load per week after the introduction of the satellite TV **A)**☐ 1to 10 **B)**☐ 11to 15 **C)**☐ 16to 20 **D)**☐ 21to 25 **E)**☐ Above25

PART TWO: PROBLEMS OF TRADITIONAL INSTRUCTION

The following is the list of items that are related to problems that were encountered while conducting the instructional process with Traditional teacher based instruction before the introduction of the Plasma TV. Please indicate the extent of your agreement/disagreement by using a check mark "√" in appropriate scale options.

No	ITEM	SA	A	UD	DA	SD
2.1	Un availability of qualified teachers with the required number.					
2.2	Lack of science laboratory with the required standard.					
2.3	Traditional way of instruction does not encourage active learning.					
2.4	Problem of efficiency in education.					
2.5	Problem of quality of education.					
2.6	Problem of access of different materials that assist the teaching learning process.					
2.7	Difficulty to bring all kind of necessary information in to the classroom.					
2.8	Traditional way of instruction does not make students problem solver and critical thinkers.					
2.9	Traditional way of instruction does not prepare student for Global awareness.					
2.10	Traditional way of instruction lack to create multiple means of representation (Digital images, Digital sound)					
2.11	Traditional way of instruction lack to utilize varied and divers curriculum materials other than traditional text resources.					

PART THREE: THE ADVANTAGE OF PLASMA TV INSTRUCTION OVER TRADITIONAL INSTRUCTION

The following is the list of items that are related to the advantage of plasma TV instruction over Traditional teacher based instruction towards improving student academic achievement. Please indicate the extent of your agreement/disagreement by using a check mark "√" in appropriate scale options.

No	ITEM	SA	A	UD	DA	SD
3	**Question related to advantages of plasma TV instruction over traditional Teacher towards improving student Academic Achievement.**					
3.1	Plasma TV instruction helps students to be active participant in the teaching learning process.					
3.2	Plasma TV instruction encourages students to be creative and problem solving.					
3.3	Plasma TV instruction creates conducive atmosphere in the teaching learning process.					
3.4	Plasma TV instruction consider student understanding difference.					
3.5	The classroom discipline becomes better and better after introduction of the plasma TV instruction.					
3.6	The introduction of Plasma TV instruction make the teaching learning process more students centered.					
3.7	The Plasma TV instruction helps to cover the whole portion at the end of the semester.					
3.8	Plasma TV instruction cover all-important portions of student textbook.					
3.9	Plasma TV instruction utilize different method of teaching.					
3.10	Plasma TV instruction improve academic achievement of students					
3.11	During Plasma TV instruction classroom teachers have sufficient time to assess the performance of their students.					
3.12	Students prefer to learn with Plasma TV instruction than with classroom teacher.					
3.13	The classroom teacher gets better chance to acquaint himself with his student.					
3.14	The classroom teacher gets leisure time to prepare work sheet and other material to enhance student achievement.					
3.15	Student benefits a lot from the demonstration of different experiments from the Plasma TV instruction.					
3.16	The introduction of the plasma TV instruction reduce the burden of the classroom teacher					
3.17	Plasma TV instruction create multiple means of representation (Digital images, Digital sound)					
3.18	Plasma TV instruction provide a varied and divers curriculum materials in addition to traditional text resources.					
3.19	Plasma TV instruction prepare students better for their National Examination than classroom teacher.					

PART FOUR: LIMITATIONS OF PLASMA TV INSTRUCTION

The following is the list of items that are related to the disadvantages of plasma TV instruction towards improving student academic achievement. Please indicate the extent of your agreement/disagreement by using a check mark "√" in appropriate scale options.

No	ITEM	SA	A	UD	DA	SD
4	**Question related to gaps that are observed to enhance student national examination result as a result of Plasma TV instruction.**					
4.1	Plasma TV instruction lacks the eliciting (draw out) of desired responses from the learner.					
4.2	Plasma TV instruction lacks assessment of student performance.					
4.3	Plasma TV instruction lacks the significance of assessing student results.					
4.4	Plasma TV instruction lacks taking the appropriate adjusted action.					
4.5	Plasma TV instruction lacks feedback on the past performance of the student.					
4.6	Plasma TV instruction lacks selection of appropriate mode of instruction.					
4.7	Plasma TV instruction lacks classroom motivation.					
4.8	Plasma TV instruction lacks classroom control.					
4.9	In adequacy of technical support for teachers.					
4.10	Failure of institutionalization of the ICT program with in the school.					
4.11	Poor utilization of Plasma TV instruction according to its schedule.					
4.12	Disruption of transmit ion during instruction due to power failure or technical problems.					

PART FIVE: CHANGES THAT HAVE BEEN OBSERVED AS A RESULT OF PLASMA TV INSTRUCTION

The following is the list of items that are related to changes, which have been observed on the competence and learning activities of the learner after the introduction of the Plasma TV. Please indicate the extent of your agreement/disagreement by using a check mark "√" in appropriate scale opt

No	ITEM	SA	A	UD	DA	SD
5	**Question related to changes that have been observed on the competence and learning activities of students.**					
5.1	Students understand Plasma TV instruction better than the classroom teacher.					
5.2	Student competition level increased after the introduction of Plasma TV instruction than before its intervention.					
5.3	Introduction of Plasma TV instruction encourage cooperative learning than the traditional way of teaching.					
5.4	Students' participation with in the classroom increased after the introduction of Plasma TV instruction.					
5.5	Plasma TV instruction conceder student understanding difference with in the classroom.					
5.6	Female student perform better than boys at learning with Plasma TV instruction.					
5.7	Students have sufficient time to ask unclear points during the plasma TV instruction.					
5.8	Students have sufficient time to ask unclear points after the plasma TV instruction.					
5.9	The pace of the Plasma TV instructions comfortable to students to follow up the lesson.					
5.10	Student use their exercise book properly after the introduction of Plasma TV instruction than before its intervention.					
5.11	Students are encouraged to do their homework and class work after the introduction of Plasma TV instruction.					
5.12	Teaching with plasma TV is inconvenient to medium learners.					
5.13	Teaching with plasma TV is inconvenient to slow learners.					
5.14	Boys perform better than females at learning with the plasma TV instruction.					

PART SIX: PREFERD METHODE OF INSTRUCTION

Here are some questions that are related to the method of instruction preferred by teachers and students. Please respond to each item by encircling the letter of your choice or by filling out the necessary information in the space provided

6.1.The method of instruction preferred by teacher's is_____

A) Traditional method of instruction.
B) Plasma TV instruction
C) Other (please specify)_____

6.2.Why you choose this particular method of instruction?

A)_____
B)_____
C)_____

6.3. Which method of instruction is preferred by your students?

A) Traditional method of instruction.
B) Plasma TV instruction
C) Other (please specify)_____

6.4.What could be the reason for their choice?

A)_____
B)_____
C)_____

PART SEVEN: ACTIVITIES THAT NEED TO BE DONE TO MAKE THE PLASMA TV INSTRUCTION MORE EFFECTIVE

The following is the list of items that are related to the activities that need to be done to make the Plasma TV instruction more effective so as to improve student National Examination result. Please indicate the extent of your agreement/disagreement by using a check mark "√ " in appropriate scale options

No	ITEM	SA	A	UD	DA	SD
7	**Question related to activities that need to be done to make the Plasma TV instruction more effective so as to improve Student National Examination results.**					
7.1	Increasing contact hour of the classroom teacher.					
7.2	Adjusting the rate of the Plasma TV instruction.					
7.3	Providing the plasma TV instruction Guide for student with sufficient copy.					
7.4	Providing the plasma TV instruction Guide for teachers with sufficient copy.					
7.5	Preparing a planed tutorial program for each subject.					
7.6	Using plasma TV instruction as supplementary instructional method by classroom teacher.					
7.7	Decreasing the present number of student below 50 per class.					
7.8	Providing the necessary training for the classroom teacher.					
7.9	Providing the necessary training for the student how to learn with plasma TV instruction.					
7.10	Establishing a responsible body at the sub- city level so as to follow up the effectiveness of plasma TV instruction.					

8) Below are some open-ended question items. Please list down your suggestion in the space provided.

8.1) What were the major problems that are encountered in the teaching learning process before the introduction of Plasma TV instruction?

_____

_____

_____

8.2) How those problems have been solved by the introduction of the Plasma TV?

_____

_____

_____

8.3) What changes do you have observed on learning activities of student after the introduction of the plasma TV instruction?

_____

_____

_____

8.4) What are the major problems of Plasma TV instruction?

_____

_____

_____

8.5) How do these problems could be solved?

_____

_____

_____

8.6) What measures should be taken to integrate the Traditional Teacher based instruction with Plasma TV instruction so as to enhance students national examination result?

_____

_____

_____

THANK YOU ONCE AGAIN!

Appendix A2: Interview Guide for School Directors and Sub-City Supervisors

Addis Ababa University
School of Graduate Studies
College of Education
Department of Educational Planning and Management

Interview Guide for School Directors and Sub-City Supervisors

Dear respected School Directors and Sub-City Supervisors

This structured Interview is designed to solicit data for a research entitled "A comparative study on teacher and plasma TV based instruction towards improving student National Examination result." The main purpose of the research is to identify the advantage and limitation of both methods of instruction towards improving student result in national examination. And to investigate whether or not significant achievement observed after the intervention of the plasma TV instruction. To this end, you are requested to express your opinion regarding the two methods of instruction. Your thoughtful responses to the questions are sought to be of great help to the success of this research. Therefore, please kindly extend your cooperation by frankly and honestly responding to the item contained in this structured Interview. Be sure that your response are kept in strict confidence and be used for academic purpose only.

THANK YOU IN ADVANCE FOR YOUR COOPERATION

1). What problems do you have observed to increase student national examination result before the introduction of Plasma TV instruction?

_____

_____

2). What measures were taken to solve those problems?

_____

_____

3). What major achievements were obtained as a result of introduction of Plasma TV instruction into secondary schools, related to increasing student result in National Examination?

_____

_____

4). What are the advantages of Plasma TV instruction over teacher based instruction in increasing student result in National Examination?

_____

_____

5). What major problems had you observed while conducting instruction through Plasma TV?

Like the distribution level of plasma TV instruction guide for students and Teachers. And others.

_____

_____

6). What measure (s) should be taken to alleviate those problems of Plasma TV instruction?

_____

_____

7). One strong critics of Plasma TV instruction is that, the rate of the instruction is not convenient to students to follow up the instruction. Do you agree with this statement? If yes! What measures have you taken to solve this problem?

_____

_____

8). What should be the role of classroom teachers to fill the gaps that are observed as a result of Plasma TV instruction? And do you believe that most of classroom teachers know their responsibility?

_____

_____

9). Do you believe that the introduction of Plasma TV instruction increase the competence and the learning activities of students? If yes! How could it be explained?

_____

_____

10). How could it be possible to integrate the effort of classroom teachers with that of plasma TV instruction so as to enhance students result in National Examination?

_____

_____

11). In your school/ sub-city which methods of instruction do students and teachers Prefer?

_____

_____

12). What could be their reason(s)?

_____

_____

THANK YOU ONCE AGAIN!

Appendix A3: Instrument for Student Respondents (Amharic)

በአዲስ አበባ ዩኒቨርሲቲ
የትምህርት ኮሌጅ
የትምህርት ኘላንና ስራ አመራር ትምህርት ክፍል

በአስረኛ ክፍል ተማሪዎተ የሚሞላ መጠይቅ

መግቢያ

ይህ መጠይቅ « የክፍል ውስጥ መምህራንና የኘላዝማ ቴሌቭዥርዝ የትምህርት አሠጣጥ ዘዴዎች በተማሪዎች ብሔራዊ ፈተና ውጤት ላይ ያመጡትን መሻሻል ለማጥናት» በሚል ርዕስ ለሚሠራ የጥናታዊ ፅሑፍ መረጃ ለማሠባሠብ ሲሆን፤ አላማወም የኘላዝማ ቴሌቭዥን የትምህርት ስርጭት ከመጀመሩ በፊት እና ከተጀመረ በኃላ በተማሪዎች የብሔራዊ ፈተና ውጤት ላይ የመጣውን ለውጥ በማወዳደር ለሆዲፊቱ የበለጠ መሻሻል የሚመጣበትን ሁኔታ ለማመለከት ይህናል።

መግለጫ:

1. በመጠይቁ ላይ ስም መፃፍ አያስፈልጐልትም
2. እያንዳንዱን ጥያቄ በጥልቀት በማንበብ ምላሽ ይስጡባቸው
3. ማንኛውም የሠጡት መልስ ከጥናቱ አላማ ወጭ ለምንም ተግባር አሣልፎ አይሠጥም
4. እባክዎ ሁሉንም ጥያቄዎች በመመለስ ይተባባሩ
5. ምላሽ የሠጡባቸውን መጠይቅ ለሚመለከተው አካል ይመልሡ።

ክፍል አንድ ግላዊ ሁኔታ

ከዚህ በታች የተዘረዘሩት የግላዊ ሁኔታን የሚገልፁ ነጥቦች ናቸው። እባክዎ እያንዳንዱን ጥያቄ በአትኩሮት አንብበው ምላሽዎን የ (√) ምልክት ወይንም አግባብ ባለው ሀረግ በመጠቀም በተሠጠው ክፍት ቦታ ምላሽቸሁን ያኑሩ።

1.1 የትምህርት ቤቱ ስም ----------

1.2 ፆታ ☐ ሀ ወንድ ☐ ለ. ሴት

1.3 እድሜ ☐ ሀ. ከ11 እስከ 16 ዓመት
☐ ለ. ከ17 እስዘ 21 ዓመት
☐ ሐ.ከ21 ዓመት በላይ

1.4 በሳተላይት ትምህርት ቴሌቭዥን ኘሮግራም ምን ያህል ዓመት ተማርክ (ሽ)

☐ 1 ዓመት
☐ 2 ዓመት
☐ 3 ዓመት

1.5 በሳተላይት ትምህርት ቴሌቭዥን ኘሮግራም መማር የማትፈልገወ (ጊው) የትምህርት ዓይነት

☐ ሀ. ባዬሎጂ ☐ ሐ. ፊዚክስ
☐ ለ. ኬምስትሪ ☐ መ. ሒሳብ

1.6 በሳተላይት ትምህርት ቴሌቭዥን ፕሮግራም መማር የማትፈልገው(ጊው) የትምህርት ዓይነት

☐ ሀ. ባዮሎጂ ☐ ሐ. ፊዚክስ

☐ ሰ. ኬምስትሪ ☐ መ. ሒሳብ

ክፍል ሁለት፡ በክፍል ውስጥ መምህራን የትምህርት አሠጣጥ ዘዴ ያጋጠው ችግሮች

የሚከተሉት ነጥቦች የሳተላይት ትምህርት ቴሌቭዥን ፕሮግራም ከመጀመጀሩ በፊት የክፍል ውስጥ መምራን ያጋጥማቸው የነበሩ ችግሮች ሲሆኑ መስማማትህን (ሽን) ወይም አለመስማማትህን (ሽን) የ «√» ምልክት በማድረግ በተሠጠው ክፍት ቦታ ላይ አመልክት (ች)

ተ.ቁ						
		በጣም ጠንካራ አስማማለሁ	አስማማለሁ	መወሰን አልችልም	አልስማማም	በጣም ጠንካራ አልስማማም
2.1	ብቃት ያላቸው መምህራን በበቂ ቁጥር አለመገኘት					
2.2	የሳይንስ ቤተ ሙከራዎች በበቂ ደረጃ አለመገኘት					
2.3	የክፍል ውስጥ መምህራን የትምህርት አሠጣጥ ዘዴ ተማሪውችን አሳታፊ አለመሆን					
2.4	በትምህርት ሒደቱ ውስጥ የብቃት ችግር መኖር					
2.5	በትምህርት ሒደቱ ውስጥ የጥራት ችግር መኖር					
2.6	የትምህርት ሒደቱን የሚረዱ መርጃ መሣሪያዎች በተፈለገው መጠን አለመኖር					
2.7	አስፈላጊ የሆኑ መረጃ መሣሪያወች ሁሉ በአንድ ግዜ እክፍል ውስጥ መጠቀም አለመቻል					
2.8	መምህር ተኮር የትምህርት አሠጣጥ ሒደት ተማሪዎችን ችግር ፈቺ እንዲሆን አለማድረግ					
2.9	መምህር ተኮር የትምህርት አሠጣጥ ዘዴ ተማሪዎች አለም አቀፍ ሁኒታ ግንዛቤ እንዲኖራቸው አለማድረጉ					
2.10	መምህር ተኮር የትምህርት አሠጣጥ ዘዴ ዘርፍ ብዙ የተምህርት አቀራረብ ዘዴዎችን ያጣመረ አለመሆን (ለምሳሌ ዲጅታል ምስል እና ዲጅታል ድምፅን)					
2.11	መምህር ተኮር የትምህርት አሠጣጥ ዘዴ ከተማሪዎ የክፍል መፅሐፍት ውጭ የተለየዩ እና ስፋት ያላቸው የስነ ትምህርት መሣሪያዎችን ለመጠቀም የራሱ የሆነ ወስንነት መኖር					

ክፍል ሶስት፡ የኘላዝማ የቴሌቭዥን የትምህርት ስርጭት ክክፍል ውስጥ መምህራን የሚሻልባቸው ነጥቦች

የሚከተሉት ነጥቦች የኘላዝማ የቴሌቭዥን የትምህርት ስርጭት ክክፍል ውስጥ መምህራን የሚሻልባቸው ነጥቦች ሲሆኑ በነጥቦቹ መስማማትህን(ሽን) ወይም አለመስማማትህን (ሽን) የ «√» መልክት በማድረግ በተሠጠው ክፍት ቦታ ላይ አመልክት(ች)

ተ.ቁ		እጅግ በጣም አስማማለሁ	አስማማለሁ	መወሰን አልችልም	አልስማማም	እጅግ አልስማማም
3.1	የኘላዝማ ቴሌቭዥን የትምህርት አሠጣጥዘዴ ተማሪዎችን በመማር ማስተማሩ ሂደት አሣተፉ ያደርጋል፡፡					
3.2	የኘላዝማ ቴለቭዥን የትምህርት አሠጣጥ ዘዴ ተማሪዎችን ችግር ፈቺ እና አዲስ ነገር ፈጣሪ እንዲሆኑ ያደርጋቸዋል፡፡					
3.3	የኘላዝማ ቴሌቭዥን የትምህርት አሠጣጥ ዘዴ ለማመር ማስተማሩ ሂደት ምቹ ሁኔታን ፈጥሯል፡፡					
3.4	የኘላዝማ ቴሌቭዥን የትምህርት አሠጣጥ ዘዴ የተማሪዎችን የትምህርት አረዳድ ልዩነት ግንዛቤ ውስጥ ያስገባል፡፡					
3.5	የኘላዝማ ቴሌቭዥን የትምህርት አሠጣጥ ከተጀመረ ወዲህ የክፍል ውስጥ ስነ ሥርዓት እየተሻሻለ መጥቷል፡፡					
3.6	የኘላዝማ ቴሌቭዥን የትምህርት አሠጣጥ ዘዴ የመማር ማስተማሩን ሂደት ተማሪ ተኮር አድርገዋታል፡፡					
3.7	የኘላዝማ ቴሌቭዥን የትምህርት አሠጣጥ ዘዴ በዓመቱ ወይም በመንፈቀ ዓመቱ የተመደበውን የትምህርት ይዘት ያጠናቅቃል፡፡					
3.8	የኘላዝማ ቴሌቭዥን የትምህርት አሠጣጥ ዘዴ ዋና ዋና የትምህርት ይዘቶችን ሁሉ ይሸፍናል፡፡					
3.9	የኘላዝማ ቴሌቭዥን የትምህርት አሠጣጥ ዘዴ የተለያዩ የማስተማር ዘዴዎችን ይጠቀማል					
3.10	የኘላዝማ ቴሌቭዥን የትምህርት አሠጣጥ ዘዴ የተማሪዎችን ውጤት አሻሽሏል					
3.11	የኘላዝማ የትምህርት ስርጭት ወቅት የክፍል መምህራን የተማሪዎቻቸውን የትምህርት አቀባበል የመገምገምያ ምቹ ሁኔታ ፈጥሮላቸዋል					
3.12	ተማሪዎች ክክፍል መምህራን ይል በኘላዝማ የትምህርት አሠጣጥ ዘዴ መማር ይመርጣሉ					
3.13	የኘላዝማ የትምህርት አሠጣጥ ዘዴ ከተጀመረ ወዲህ የክፍል ውስጥ መምህራን ተማሪዎቻቸውን የበለጠ የማረዱበት ሁኔታ ተመቻችቷል					
3.14	የክፍል ውስጥ መምህራን ወርክሸት እና ሌላ የመርጃ መሣሪያዎችን ለመስርያ ትርፍ ግዜ አግኝተዋል					
3.15	የኘላዝማ የትምህርት አሠጣጥ ሥርጭት ወቅት ከሚተላለፍ የቤተመክራ ሠርቶ ማሣያዎች ተማሪዎች ብዙ ለመማር ምቹ ሁኔታ ተፈጥሮላቸዋል					
3.16	የኘላዝማ የትምህርት አሠጣጥ ሥርጭት ከተጀመረ ወዲህ ለመምህራን የስራ ሚና አቃለላቸዋል፡፡					
3.17	የኘላዝማ የትምህርት አሠጣጥ ዘዴ ዘርፈ ብዙ የትምህርት አቀራረብ ዘዴዎች ያጣመረ መሆን (ዲጅታል ምስልን ክዲጅታል ድምፅ ሣገር ያዛመደ መሆን)					
3.18	የኘላዝማ የትምህርት አሠጣጥ ዘዴ ከተማሪዎች የክፍል ውስጥ መማሪያ መፅሐፍ በተጨማሪ የተለያዩ እና ስፋት ያላቸውን የስን ትምህርት ዘዴዎችን ለመጠቀም የሚያስችል መሆኑ					
3.19	የኘላዝማ የትምህርት አሠጣጥ ዘዴ ክክፍል ውስጥ መምህራን በተሻለ ሰብሐራዊ ፈተና የሚያዘጋጅ መሆኑ፡፡					

ክፍል አራት ፡ የኘላዝማ የትምህርት አሰጣጥ ዘዴ ያሉበት ውስንነቶች

የሚከተሉት ነጥቦች የኘላዝማ የተምህርት ስርጭት ዘዴ የተማሪዎችን የፈተና ውጤት ለማሻሻል ያሉበትን ውስንነት ጋር ተዛምዶ ያላቸው ሲሆኑ በነጥቦች መስማማትህን (ሽን) ወይም አለመስማማትህን (ሽን) የ«√» ምልክት በማድረግ በተሰጠው ክፍለ ቦታ ላይ አመልክት (ች)

ተ.ቁ		እጅግ በጣም እስማማለሁ	እስማማለሁ	መወሰን አልችልም	አልስማማም	እጅግ በጣም አልስማማም
4.1	የኘላዝማ የትምህርት አሠጣጥ ዘዴ ተማሪዎች ምላሽ እንዲሰጡ የማበረታታት ውስንነት አለበት፡፡					
4.2	የኘላዝማ የትምህርት አሠጣጥ ዘዴ ተማሪዎች ችሎታ የመገምገም ውስንነት አለበት					
4.3	የኘላዝማ የትምህርት አሠጣጥ ዘዴ ተማሪዎች ውጤት የመገምገም አሥፈላጊነት ላይ ውስጥነት ይታይበታል፡፡					
4.4	የፕላዝማ ትምህርት አሠጣጥ ዘዴ የሁኔታዎች ጋር የተዘመደ ማስተካከል የማድረግ ውስጥነት ይታይበታል፡፡					
4.5	የፕላዝማ ትምህርት አሠጣጥ ዘዴ ተማሪዎች ያለውን ትምህርት ይዘት አቀባበል ላይ ግብረ መልስ የማግኘት ወስጥነት ይታይበታል					
4.6	የፕላዝማ ቴሌቨዥን የትምህርት አሠጣጥ ዘዴ ተስማማ የሆነ የትምህርት አሠጣጥ ዘዴ የመምረጥ ውስጥነት ይታይበታል					
4.7	የፕላዝማ ቴሌቨዥን የትምህርት አሠጣጥ ዘዴ ተማዎችን አክፍል ውስጥ የማነቃቃት ውስንነት አለበት፡፡					
4.8	የኘላዝማ ቴሌቨዥን የትምህርት አሠጣጥ ዘዴ የክፍል ውስጥ ቁጥጥር ላይ ውስንነት ይታይበታል፡፡					
4.9	የኘላዝማ ቴሌቨዥን የትምህርት አሠጣጥ ዘዴ ለማገዝ የሚየገለግሉ በቂ የሆኑ ቴክኒካል ስልጠናዎች ለመምህሩ በበቂ ሁኔታ አለመዘጋጀት					
4.10	የ ICT (የመረጃ ግንኙት ቴክንዬሎጂ) በተመለከተ የትምህርት ቤት ማህበረሠብ አንድ አይነት ግንዛቤ እንዲኖር ማድረግ አለመቻል					
4.11	የኘላዝማ ቴሌቨዥን የትምህርት አሠጣጥ ዘዴ በተቀመጠለት ሰዓት ---- ግዜ መሉ በመሉ በየትምህርት ቤቶች የማስተላለፍ ውስንነተ መኖር					
4.12	የኘላዝማ ቴሌቨዥን የትምህርት አሠጣጥ ዘዴ ስርጭት ቴክኒካል መሆኑና ከመብራት መቋረጥ ጋር በተያያዘ የሚገጥሙ ችግሮች፡					

ክፍል አስምት፤ የኘላዝማ የትምርት አሠጣጥ ዘዴ ከተጀመረ ጀምሮ የታዩ ለውጦች

የሚከተሉት ነጥቦች የኘላዝማ የትምህርት አሠጣጥ ዘዴ ከተጀመረ ጀምሮ በተማሪዎች የእርስ በርስ ውድድር እና የትምህርት አቀባበል ረገድ የታዩ ለዉጦች ላይ ያተኮሩ ሲህኑ በነጥቦቹ መስማማትትህን (ሽን) ወይም አለመስማማትህን (ሽን) የ«√» ምልክት በማድረግ በተሰጠው ክፍት ቦታ ላይ አመልክት (ች)

ተ.ቁ		አጅግ በጣም አስማማለሁ	አስማማለሁ	መወሰን አልችልም	አልስማማሁ	አጅግ በጣም አልስማማሁ
5.1	ተማሪዎች ከክፍል ውስጥ መምህር ይልቅ የኘላዝማ ቴሌቭዥን የትምህርት አሠጣጥ ዘዴን ለበለጠ ይገነዘባሉ·					
5.2	የኘላዝማ ቴሌቭዥን የትምህርት ዝዴ ከተጀመረ በኃላ የተማሪዎች የእርስ በርስ ውድድር ደረጃ እየጨመረ ማጥቷል፡፡					
5.3	የኘላዝማ ቴሌቭዥን የትምህርት ዘዴ ከክፍል መምህሩ በተሻለ ተማሪዎች ተባብረው እነዱሠሩ ያበረታታል፡፡					
5.4	የኘላዝማ ቴሌቭዥን የትምህርት ዘዴ ከተጀመረ በኃላ የተማሪዎችና የክፍል ውስጥ ተሳትፎ ጨምሯል					
5.5	የኘላዝማ ቴሌቭዥን የትምህርት ዘዴ ተማሪዎችን የመረዳት ችሎታ ልዩነት ያገናዘበ ነው፡፡					
5.6	ሴት ተማሪዎች ከወንዶች በተሻለ በኘላዝማ ቴሌቭዥን የትምህርት ዘዴ የመረዳት ችሎታ አላቸው፡፡					
5.7	በኘላዝማ ቴሌቭዥን የትምህርት ሥርጭት ወቅት ተማሪዎች ያልገቧቸውን ነጥቦች የመጠየቅ በቂ ግዜ አላቸው፡፡					
5.8	ከኘላዝማ ቴሌቭዥን የትምህርት ሥርጭት በኃላ ተማሪዎች ያልገቧቸውን ነጥቦች የመጠየቅ በቂ ግዜ ካላቸው·					
5.9	የኘላዝማ ቴሌቭዥን የትምህርት አሠጣጥ ዘዴ የስርጭት ፍጥነት ተማሪዎች የትመህርት ይዘቱን በሚረዱበት ሁኔታ የተዘጋጀ ነው·					
5.10	የኘላዝማ ቴሌቭዥን የትምህርት አሠጣጥ ዘዴ ከተጀመረ በኃላ ከመጀመሩ በፊት ከነበረው በተሻለ ሁኒታ ተማሪዎች የመማሪያ ደብተራቸውን በአግባቡ መጠቀም ጀምረዋል፡፡					
5.11	የኘላዝማ ቴሌቭዥን የትምህርት አሠጣጥ ዘዴ ከተጀመረ በኃላ ተማሪዎች የቤትም ሆነ የክፍል ውስጥ ሥራዎችን ለመስራት የበለጠ ተበርታተዋል፡፡					
5.12	የኘላዝማ ቴሌቭዥን የትምህርት አሠጣጥ ዘዴ ለመካከለኛ ችሎታ ባላቸው ተመራጭ ምቹ የትምህርት አሠጣጥ ዘዴ ነው፡፡					
5.13	የኘላዝማ ቴሌቭዥን የትምህርት አሠጣጥ ዘዴ ዝቅተኛ ችሎታ ላላቸው ተማሪዎች ምቹ የትምህርት አሠጣጥ ዘዴ ነው፡፡					
5.14	ወንድ ተማሪዎች ከሴቶች በተሻለ በኘላዝማ ቴሌቭዥን የትምህርት ዘዴ የመረዳት ችሎታ አላቸው·					

ክፍል ስድስት ፤ የተሻለ የትምህርት አሠጣጥ ዘዴ

የሚከተሉት ነጥቦች ትኩረት የሚያደርጉት በተማሪዎች እና በመምህራን የሚመረጥ የትምህርት አሠጣጥ ዘዴ ላይ ሲሆን ፤ እባክዎ የመላሽዎን ፊደል በማክበብ ወይመ አግባብነት ያለው ምላሽዎን በተሠጠው ክፍት ቦታ ላይ በመሙላት ያመልክቱ።

6.1 በተማሪዎች የሚመረጥ የትምህርት አሠጣጥ ዘዴ ----------

ሀ. የክፍት ውስጥ መምህራንን መሠረት ያደረግ የትምህርት አሠጣጥ ዘዴ

ለ. የኘላዝማ ቴሌቭዥን መሠረት ያደረገ የትምህርት አሠጣጥ ዘዴ

ሐ. ሌላ ካለ (እባክዎ ይግለፁ)----------

6.2 ለምንድን ይመስለዎታል ይህንን ዘዴ የመረጡት

ሀ.----------

ለ.----------

ሐ.----------

6.3 የትኛውን የትምህርት አሠጣጥ ዘዴ በመምህራኖቻቸው የተመረጡ ናቸው

ሀ. የክፍል ውስጥ መምህራንን መሠረት ያደረገ የትምህርት አሠጣጥ ዘደ

ለ. የኘላዝማ ቴሌቭዥንን መሠረት ያደረገ የተምህርት አሠጣጥ ዘዴ

ሐ. ሌላ ካለ (እባክዎ ይግለፁ)----------

6.4 ለምን ይመስለታል ይህንን ዘዴ የሚመርጡት

ሀ.----------

ለ.----------

ሐ.----------

ክፍል ሰባት፡ የኘላዝማ ቴሌቭዥን የትምህ ፖት አሠጣጥ ዘዴን የተሻለ ውጤታማ ለማድረግ ሊወሠዱ የሚገቡ ማስተካከያዎች

የሚከተሉት ነጥቦች የኘላዝማ የትምህርት አሠጣጥ ዘዴን የበለጠ ውጤታማ ለማድረግ ለወሠዱ የሚገቡ የማስተካከያ እርምጃዎችን የሚጠቁሙ ሲሆን ነበጥቦቹ መስማማትህን (ሽን) ወይም አለመስማማትህን (ሽን) የ«√» ምልክት በማድረግ በተሠጠው ክፍት ቦታ ላይ አመልክት(ች)

ተ.ቁ						
		እጅግ በጣም አስማማለሁ	አስማማለሁ	መወሰን አልችልም	አልስማማም	እጅግ በጣም አልስማማም
7.1	የክፍል ውስጥ መምህራንና በአንድ ክፍል ግዜ የሚኖራችሀ ቆይታ መጨመር					
7.2	የኘላዝማ ቴሌቭዥን ሥርጭት ፍጥነት በአግባቡ ማስተካከል					
7.3	የኘላዝማ ቴሌቭዥን የማስተማሪያ ለተማሪዎች በበቂ ቅጅ ማዳረስ					
7.4	የኘላዝማ ቴሌቭዥን የማስተማሪያ መመሪያ ለመምህራን በበቂ ቅጅ ማዳረስ					
7.5	በዕቅድ ላይ መሠረተ የደረገ ለእየንዳንዱ የትምህርት አይነት የድጋፍ ኘሮግራም (Tu Tookml) ማዘጋጀት					
7.6	የኘላዝማ ቴሌቭዥን የማስተማሪያ ዘዴ እንደ ዋና አስተማሪ ሳይሆን ለክፍል ውስጥ መምህራንን አጋዥ በሆነ መልኩ ማዘጋጀት					
7.7	የተማሪዎችን ቁጥር አሁን ካለበት ከ50 በታች መቀነስ					
7.8	ቴክኒካል የሆነ ስልጠናዎችን ለመምህራን ማዘጋጀት					
7.9	ለተማሪዎች እንዴት ከኘላዝማ ቴሌቭዥን የማስተማሪያ ዘዴ መማር እንደሚችሉ በቂ የሆነ ስልጠና ማዘጋጀት					
7.10	በክፍለ ከተማ ደረጃ አንድ የኘላዝማ ቴሌቭዥን የትምህርት አሠጣጥ ዘዴን ውጤታማነት የሚከታተል እና የሚገመገም መዋቅር ማዘጋጀት					

ክፍል ስምንት፡ ከዚህ በታች የመጠይቁ መለሹ ሀሣቡን በበቂ ሁኔታ የማገልፅባቸው ነጥቦች ተቀምጠዋል። አባክዎ እያንዳንዱን ጥያቄ በአዕንኦት ካነበቡ በኃላ አግባብነት ያለው ብለሀ የሚያስቡትን ምላሽ በባዶው ቦታ ይመሉ።

8.1 በኘላዝማ ቴሌቭዥን መማር ከጀመሩ በኃላ በተማሪዎች የትምህርት አቀባበል እንቅስቃሴ ላይ ያስተዋሉት ለውጥ ምን ምን ነው?

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8.2 የኘላዝማ ቴሌቭዥን የትምህርት ዘዴ ዋና ዋና ችግሮች ምን ናቸው

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8.3 ከላይ የጠቀሷቸው ችግሮች እንዴት ሊወገዱ ይችላሉ ብለው ያስባሉ

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8.4 የኘላዝማ ቴሌቭዥን የትምህርት አሠጣጥ ዘዴ እና የክፍል ውስጥ መምህራንን ጥረት ለማቅናጀት ምን አይነት እርምጃዎች መወሠድ ይገባቸዋል ይላሉ

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Appendix B1: Total number of Students in Sampled Sections and Participant of the Study

School	Ayer Tena secondary school																	
Sampled section	1		5		9		12		16		20		24		28		32	
Sex	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
Total number of students in sampled section	49	45	35	63	53	45	43	41	42	52	47	43	44	48	39	50	48	43
sampled students	9	8	6	13	10	8	8	7	8	10	9	8	8	9	7	10	9	8

School	Kokebe Tseba Secondery School															
Sampled section	1		5		9		13		17		21		25		29	
Sex	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
Total number of students in sampled section	29	36	35	30	28	37	36	37	34	31	34	22	19	31	25	46
sampled number students	7	9	8	7	7	9	9	9	8	7	8	5	4	7	6	11

School	Derartu Tulu Secondary School							
Sampled section	1		4		7		10	
Sex	M	F	M	F	M	F	M	F
Total number of students in sampled section	46	36	50	29	39	30	39	41
sampled number of students	11	9	12	7	9	7	9	10

School	Yekatit-12 Secondary School									
Sampled section	1		6		11		16		21	
Sex	M	F	M	F	M	F	M	F	M	F
Total number of students in sampled section	43	30	36	41	46	27	28	44	41	42
sampled students	10	7	9	10	11	6	7	11	10	10

School	Menelik Secondary School									
Sampled section	1		5		9		14		18	
Sex	M	F	M	F	M	F	M	F	M	F
Total number of students in sampled section	24	48	34	39	33	44	39	41	42	35
sampled students	6	12	8	9	8	11	9	10	10	8

Appendix B2: Total number of Teachers in Selected Schools at each subject and Participant of the Study

School	Ayer Tena			Derartu Tulu			Kokebe Tsebah			Menelik			Yekatite -12		
Subject	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T
Biology	7	0	7	4	0	4	5	0	5	4	1	5	4	0	4
Chemistry	7	2	9	5	1	6	5	2	7	5	0	5	4	1	5
Physics	7	0	7	4	1	5	6	0	6	6	0	6	4	1	5
Mathematics	8	2	10	5	0	5	6	4	10	6	1	7	8	0	8

Appendix C: Interval to determine the sample size of simple random sampling

I=N/n Where I- Interval
N- Total number of Population
n- Total number of sample

Source: Retrieved (in March,2007) http://www.abs.gov.au/nsf/Home

Appendix D: Students' Result in EGSEC National Examination from 2002/2003-2005/2006

YEARS		Total NO of Students who set for Exam		Students Who Score Greater than C		Students Who score Less than C	
	SEX	M	F	M	F	M	F
2002/2003	BIOLOGY	3830	4012	390	134	3440	3878
	CHEMISTRY	3830	4012	134	27	3696	3985
	MATHEMATICS	3830	4012	167	43	3663	3969
	PHYSICS	3830	4012	170	35	3660	3977
2003/2004	BIOLOGY	4449	4577	397	144	4052	4433
	CHEMISTRY	4449	4577	391	124	4058	4453
	MATHEMATICS	4449	4577	379	128	4070	4449
	PHYSICS	4449	4577	410	144	4039	4433
2004/2005	BIOLOGY	4422	4412	558	197	3864	4215
	CHEMISTRY	4422	4412	398	119	4024	4293
	MATHEMATICS	4422	4412	496	148	3926	4264
	PHYSICS	4422	4412	482	181	3940	4231
2005/2006	BIOLOGY	4886	5299	747	326	4139	4973
	CHEMISTRY	4886	5299	1272	650	3614	4649
	MATHEMATICS	4886	5299	635	300	4251	4999
	PHYSICS	4886	5299	874	396	4012	4903

SOURCE: NOE

DECLARATION

I here by declare that the Master Thesis entitled "A comparative study on plasma TV and teachers' based instructions towards improving students' national Examination result in Addis Ababa" Is an original research work and has not been presented for a degree in any other University, and that all sources used for the thesis have been duly acknowledged.

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