

ADDIS ABABA UNIVERSITY SCHOOL OF GRADUATE STUDIES

**Assessment of Institutional Factors Affecting the Implementation of
Information Technology Training Program in Government Middle
Level TVET Institutes in Addis Ababa**

**By
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**July 2008
Addis Ababa**

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**A THESIS SUBMITTED TO THE SCHOOL OF GRADUATE STUDIES OF
ADDIS ABABA UNIVERSITY IN PARTIAL FULFILLMENT OF THE
REQUIREMENTS FOR THE DEGREE OF MASTER OF ARTS IN
VOCATIONAL EDUCATION MANAGEMENT**

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Acknowledgments

First of all I would like to express my deepest thanks and indebtedness to my thesis advisor Ato Lemma Setegn for his constructive comments, insightful suggestions and encouragement in the progress and outcomes of the study. I appreciate his mechanism of follow-up and good approaches that one might expect from a good advisor.

Furthermore, I would like to extend my thanks to principals, vocational counselors, supervisors, trainers, and trainees of TVET institutes under study to their willing in providing valuable information. I wish also to thank College of Education and Department of Business Education of Addis Ababa University, for facilitating and providing financial assistance for successful accomplishment of this study.

Finally, I would like to thank my wife w/ro Mestawot Amenu for her support in morale and finance from the beginning to the end of this research.

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List of Acronyms

AAU	Addis Ababa University
EGSEC	Ethiopian General Secondary Education Certificate
EMIS	Educational Management Information Systems
ESDP	Education Sector Development Program
FNG	Federal Negarit Gazeta
ICT	Information Communication Technology
IER	Institute of Educational Research
IITE	Institute for Information Technology in Education
ILO	International Labour Organization
MoE	Ministry of Education
TGE	Transitional Government of Ethiopia
TVET	Technical Vocational Education and Training
UNESCO	United Nations, Educational, Scientific and Cultural Organization

Abstract

The purpose of this study is to assess institutional factors affecting implementation of IT training program in government middle level TVET institutes in Addis Ababa. To carry out the study three government middle level TVET institutes were selected. A descriptive survey research method was employed in the study. Besides, purposive, stratified, and simple random sampling techniques were employed to select the study area and the research participants. Trainers, trainees, principals, vocational counselors and supervisors from the selected institutes were the participants of the study. Questionnaire, interview and observational check list were used as data collecting instruments. The obtained data were analyzed using percentages, mean values, and rank order correlation coefficient. The results of the study indicated that lack of competency of trainers, the inefficiency of management, inadequacy of educational materials and facilities, and poor coordination in facilitating apprenticeship were the major factors that affected the implementation of information technology. Based on the findings of the study, the mechanism of providing in-service training for trainers and principals, the way of utilizing educational materials and facilities, and mechanisms of facilitating apprenticeship are recommended.

CHAPTER 1 INTRODUCTION

1.1. Background of the problem

Information technology (IT) is one of the known types of technologies in today's world. Nowadays, it is becoming the back bone of the modern society. Because, it can be applied in various sphere of economic and social activities of human being. Supporting this Workinesh and Engida [2001:1] expressed the situation as follows:

Nowadays, remembering the world without information technology is not possible for any society. The emergence of globalization and global economy necessitates the use of IT in our daily life and narrowed the world into a village.

There are different occupations which are created on using applications of information technology. A computer is one of the modern technologies medium that is used for the development of this technology. Supporting this Alexis and Mathews [1999:35] wrote:

The information age is changing the way we work. Some jobs are disappearing, others are emerging and still others are being radically transformed by information technology and information based economy.

Thus, to cope up such change necessary training need to be taken to get skill on information technology.

Objectives of the TVET of Ethiopia, as it is stated in a document (MOE, 2007:6-7), is producing competent middle level manpower, improving of quality of TVET at all levels and make it responsive to the needs of the labour market. To achieve these objectives, information technology training, as one of TVET, is given in different TVET institutes in our country.

Even though the quality of education of a country based on the countries economy, it needs the following minimum criteria and requirements.

- The existence of professionally competent and ethically-minded teachers in the system
- The existence of an efficient management of education
- The supply of necessary educational materials and equipment
(MoE, 2002: 71)

However, to bring such expected quality training in the given training institute, institutional factors have their own great role.

The type of training programs to be offered in a given Institute determined by the facilities needed. So the training institutions differ in what they have to work with. departments of technical and vocational training institutes. Furthermore, each department is unique in its need. Therefore, to be more effective, information technology training by its nature need its own institutional facilities, like computer lab., library with necessary software's, network equipments and Internet rooms, etc.

The other important institutional factor is well equipped and experienced information technology trainers. According to the World Bank (1998), the quality of any training program is determined to a very large extent by the personnel qualities, professional competences, attitudes, and insights of trainers. The full involvement of instructors in the process of improving training programs is absolutely essential. Because good training is partly the result of the trainer's total experiences, not merely the classroom experiences with trainees.

Hallack and Calliods (1995:3), stressed on the importance of instructors by saying:

Instructors are definitely key elements in teaching learning process if not the only agent of transmission of knowledge and skills in the training institutions. In order to utilize these teaching personnel in institutes effectively, there should be a need for having appropriate leadership for carrying out effective managerial activities in the training institutions.

Regarding these instructional factors, the researcher has got chance to follow and observe the implementation of information technology training program. The researcher was department head and also one of the information technology course trainers in one of the middle level TVET institutes in Addis Ababa. He observed different institutional factors affecting the implementation of IT training from his experience and attendance of other trainers teaching sessions. He had held also informal discussion with unit leaders and management members about the issues mentioned above and noted them. The points, which were observed and discussed, mostly focused on the institutional factors that hinder the implementation of IT training. That is why the researcher's study is made to focus on the institutional factors affecting implementation of IT training.

1.2. Statement of the problem

After six years implementation of IT training in middle level TVET institutes in Addis Ababa, the trainees and trainers of IT courses were claiming on different institutional factors affecting the internal training and acceptance by apprenticeship providers. The trainers were passing their teaching time on maintaining frequently non-functioning computers. They also claim for not having in-service training on expected time. On the other hand the trainees are claiming for not getting sufficient knowledge for the courses provided during internal training and apprenticeship. So most of the time they were playing computer games during their training sessions.

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However, it was not known that such problems were unique to the middle level TVET institute where observation made by researcher or whether these problems were shared or not by other government middle level TVET institutes in Addis Ababa. Therefore, these issues need investigation and verification in all government middle level TVET institutes in Addis Ababa.

The purpose of this study was to assess the institutional factors affecting the implementation of IT training program in government middle level TVET institutes in Addis Ababa and to suggest necessary recommendations that help to reduce institutional factors affecting the training and improve implementation of IT training to its objectives.

1.3. Objectives of the study

Based up on the purpose, the specific objectives of the study are to assess:

1. trainers' capacity in providing IT training
2. management's efficiency in handling IT training
3. availability of institutional facilities and instructional materials sufficiently.
4. the extent of institutional support in facilitating apprenticeship

1.4. Basic research questions

The central question of this study is assessment of institutional factors affecting the implementation of information technology training courses in government middle level TVET institutes. Specific questions that need to be addressed are:

1. To what extent are trainers of IT able to handle training in terms of their qualification, experience, and competency?
2. What is the efficiency of the management in handling the internal training in terms of communication, supervision and decision making?

3. Are internal institutional facilities (computer lab, libraries, internet) and instructional materials (software, reference materials etc.) sufficiently exist to provide IT training?
4. What is the extent of institutional support in facilitating apprenticeship program?

1.5. Significance of the study

The goal of TVET system is to create a competent, capable and adaptable workforce to be backbone of economic and social development in Ethiopia (TVET Strategy; 2006:16). For this middle level TVET Institutions were organized and responsible to facilitate the implementation of information technology training program. Therefore, investigating institutional factors affecting this training program was the corner stone of the study. Thus, the study will be significant for the following reasons:

- It helps to examine institutional factors affecting IT training.
- It helps policy makers, planners and other educational officers to consider the IT training situation during their management and curriculum modification.
- It may serve as the springboard for further research in the area.

1.6. Delimitation of the study

The major interest of the study was to investigate what institutional factors were affecting the implementation of IT training program in government middle level TVET institutes in Addis Ababa. There are five government middle level TVET institutes. These institutes had almost similar nature in their training levels, management organization, sources of trainers, facilities, financing sources etc. Each institute provides 10+1 and 10+2 training programs for different fields. But this study was limited to the second year of 10+2 program. Because;

- 1) Trainees for first year program were placed lately for training. So the researcher believed that, the trainees would not have enough

time to evaluate and give suggestions on institutional factors affecting their IT training

- 2) Second year trainees of the institutes relatively could have sufficient time and opportunities to observe and to comment on different institutional factors affecting IT training.

1.7. Limitations of the study

Lack of interest of trainers to fill the questionnaire, shortage of time to cover most TVET institutes, and financial constraints were the major problems that the researcher faced. But with the efforts that have been made, the study has been completed successfully.

1.8. Operational definitions of important terms

Curriculum :- is a plan for action or a written document that include strategies for achieving desired goals or ends.

Curriculum Implementation :- ts the effort made to put what has been planned in to use.

Information Technology (IT) :- is the branch of technology devoted to study and application of data and processing thereof using computers.

Institutional factors- are factors that are involved in the institutes and may promote or hinder a training

Technical and Vocational Education and Training(TVET): Any education, training and learning activity to the acquisition of knowledge, understanding and skills which are relevant for employment or self-employment.

Training facilities: articles such as furniture, up-to-date computers, printers, scanners, books, networking facilities, Internet connectivity etc. that are used with out being consumed.

CHAPTER 2

REVIEW OF RELATED LITRATURE

2.1. Development of Vocational Education In Ethiopia

Vocational education in Ethiopia is an outgrowth of the educational set up in the country over the years. Prior to the 20th century, the education system was predominantly religious oriented that used to serve the manpower needs of the church and the state. Available sources indicate that there was no significant sign of vocational education at that time (Yekunoamlak, 2000; Girma, 1990).

However, there were different occupational activities in the country that had been transmitted traditionally from family to children. Such as pottery, weaving, metal work, woodwork, leatherwork, etc. But in our society, especially in rural area, such manually skilled people were isolated and despised. Because, jobs were viewed as inferior occupations (Wanna, 1998; Tekelehimanot, 2002).

Modern education, as opposed to traditional education, developed fast between the year 1908 and 1935.. For the first time, handcraft education was given parallel to the academic education for students of grade one to six to plant the dignity of work in students mind (Yekunoamlak, 2001:90). Before that time, even though, there were about thirty modern schools in the country up to 1935, none of them include vocational education in their curriculum (Girma and others 1990: 9-10).

With the objective of making the curriculum job oriented and to produce middle level work force for the economy, the concept of comprehensive program was introduced in secondary school of Ethiopia in 1961. The first general secondary school to be converted to comprehensive secondary school was woizero Sihen School in Dessie (Getachew, 2004:18). In these comprehensive schools vocational courses were provided parallel to general education under the same administration.

Around the decline of comprehensive secondary schools, curriculum was observed (Yekunoamlak, 2000). The schools lacked proper human and material resources. The quality of graduates was poor. The system was not able to absorb reasonable number of students. Later the comprehensive schools failed to achieve their mission that was reducing unemployment. Then, to alleviate the problem, attention was given to strengthen some selected comprehensive secondary schools and other technical/vocational schools. Effort were also made to improve the quality and to provide effective skills (Wanna, 1998). As a result, 10+3 technical/vocational program was introduced.

The 1994 education and training policy have brought fundamental change in educational sector in general and TVET in particular. Number of schools and enrollment has been considerably increased.

In order to meet the middle level manpower demand of the industry and service sector and commercial agriculture, expansion of TVET program to be an instrument for producing medium-level technicians equipped with practical knowledge who unlike in the past would be job creators rather than expecting jobs to be provided by the government (MoE ESDP III,2005). Based on this fact many TVET institutes have been opened in the country to cater to those who completed grade 10. In consequence, the numbers of TVET institutions were considerably increased. Up to 2006 there were 113 government TVET institutes in Ethiopia and 10 in Addis Ababa (MoE, 2007). Accordingly, the provision of training fields also increased.

2.2. The Development of Information Technology

2.2.1 The History

The main characteristics or goals of information technology development is to solve of using technologies for taking input, processing, output and communication of information. Thus, the development of information technology is directly related with the historical development of computer technologies.

The historical development of information technology can be seen in four basic periods, in which the development of the technologies try to solve the input, processing, output and communication problems of the time. These periods are known by premechanical, mechanical, electromechanical and electronic ages(Geremy, 1997: William, 1993).

The premechanical Age : 3000 B.C. -1450 A.D.

First humans communicated only through speaking and simple picture drawings known as petroglyphs (signs or simple figures carved in rock). Around 2000 B.C., Phoenicians created symbols and the Greeks later added some vowels by adapting the Phoenician alphabets. Next the Romans gave the letters Latin names to create the alphabet we use today. About 2600 B.C. the Egyptians started writing information on papyrus plant, then the Chinese , around 100 A.D., made a paper from rage which was the base for today's paper. Around 600 B.C., the Greeks used fold sheets together for storage of information.

The Mechanical Age: 1450-1840

During the premechanical age processing of information took place by memorization and calculating repeatedly. But on this mechanical age movable-type printing process, book indexes and page numbers had been started. Because, the general purpose computers, the slide rule, the Pascaline and Leibniz's machine were developed.

In 1673 Gottfried Leibniz built a mechanical calculating machine that multiplies, divides, adds and subtracts. In 1822, in England, Charles Babbage designed a Difference Engine to calculate logarithms and later in 1833 he designed the Analytical Machine that follows instructions from punched-cards. It was the first general purpose. There were also different machines that developed in this period. But all worked mechanically to process and to transmit information at this period.

The Electromechanical Age: 1840-1940.

The discovery of ways to harness electricity was the key advance made during this period. Knowledge and information could now be converted into electrical impulses. It was the beginning of telecommunication. During this era electromechanical devise like voltaic battery, telegraph, telephone and radio were built.

The Electronic Age: 1940- present.

Modern electronic computers were developed beginning from the 1940s. Depending on the kind of technology they used the computers are classified into four generations.

First generation computers(1940-1959) were normally based around wired circuits containing vacuum tubes (commonly referred to as valves) and used punched cards as the main storage medium. ENIAC' (Electronic Numerical Integrator and Computer) was typical of first-generation computer which was completed in 1946 by John Mauchly and Presper Eckert. It was weighing over 30 tones and needing 18,000 electronic valves that consumed around 25 KW of electronic power. It was, however, capable of 100,000 calculations a second- an unbelievable amount of calculating power for those days. That means it could accomplish in one day what the previous computers took 30 days to perform. In addition different computers are also developed for different purposes. The major innovations in this period are the use of vacuum tubes and stored programs.

The second-generation computers (1959-1965) became much smaller in size, faster more reliable and much greater in processing capacity. This is because of the invention the transistors that replaced the inefficient valves with a much smaller and more reliable component. Despite using transistors and printed circuits, these computers were still bulky. Generally the major innovations in this period are the transistors in place of vacuum tubes and magnetic core storage in place of punched cards as external storage.

Third generation computers (1965-1970) were known with the replacement of individual transistors by integrated circuits. This new integrated circuits increased the speed of the computer by a factor of 100,000 over the first generation computers. Arithmetic and logical operations were now being performed in microseconds or even in nanoseconds (billionth of a second). In this generation, the primary storage unit, or memory, of the computer was greatly augmented by secondary storage devise located outside the computer. All this made possible multiprocessing and multiprogramming that helped performing for efficient allocation of computer memory, control of input and output operations and other related tasks. Finally this generation was known in the innovations of integrated solid-state circuitry, improved secondary storage device and new input output devices (visual display terminals, high-speed printers).

Fourth-generation computers(1970- to present) were then developed, using a microprocessor to locate much of the computer's processing abilities on a single(small) chip, coupled with one of Intel's major innovations-the RAM chip. The microprocessors allowed fourth generation computers to be even smaller and faster than ever before. The microprocessor also allowed the development of microcomputers, personal computers that were small and cheap enough to be available to ordinary people. Hence, this generation mainly was known in major innovations of

microprocessors and further improvement of mass storage and input/output devices.

Although processing power and storage capacities have increased beyond all recognitions technology most of today computers are widely regarded as still belonging to the forth generation.

Although computers are now very sophisticated, the basic concepts have not changed.

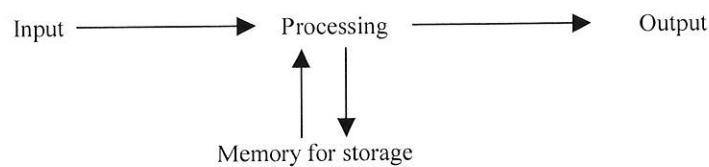


Figure 1 Basic Computer Model

The process takes data from the input and acts up on it to produce information in the form of a meaningful output. With this development of computer technologies, information also processed stored and disseminated on level of each generation.

2.2.2. In Ethiopia

Information technology is playing a very important role for the development of different sectors of a country. Like any other African countries the penetration of information technology to Ethiopia just began with the introduction of main frame computers in 1960. At the initial stage of the introduction of the computers were characterized by inadequate literacy of the users. The application of computers, and there by the development and awareness of mechanization, was related to the introduction of computers into Ethiopia by foreign suppliers. (Teferi, 1994).

The Government of Ethiopia by providing great attention to the development of information technology established the Ethiopian Science and Technology Commission (ESTC), in 1975 by proclamation No.

62/1975. Later in 1987 the National Computer Center was established under the Ethiopian Science and Technology Commission with the following major objectives:

- 1) to conduct research and development activities in computer science and technology and to disseminate the results:
- 2) to promote the development of computer knowledge and services in Ethiopia
- 3) to provide consultancy and maintenance services:
- 4) to provide training courses

Home computing were later emerging in many places of the country, but different surveys showed growth did not much with usage(Lishan, 1999).

During the beginning time, Information Technology training had been restricted to a very few individuals selected for training. The forefront institutions that conducted computer courses were:

1. Addis Ababa University established a computer center for training in 1986 under mathematics department to offer courses for extension and regular students in Diploma and B.Sc degree programmes respectively.
2. The Ethiopian Science and Technology

Later the Federal Democratic Republic of Ethiopia established the Ethiopian Information and Communication Technology Development Authority to fulfill the following objectives:

Information Communication Technology

1. Enable to contribute its critical role for accelerated attainment of political, social and economic development
2. is necessary to ascertain a national development cognizant of the dynamism, peculiarities, extent and coverage
3. is necessary to ascertain the development of nationally and globally competitive economic sector through coordinated measures (Federal Negarit Gazeta, 360/2003).

According to the new educational policy of the country, the new training program launched to specialize in computer in vocational schools. This further reinforced the growth of knowledge in information technology.

To achieve the objectives of TVET, like other fields of training, information technology courses also included in all levels of training in TVET institutes (F.N.G, 2004).

2.3. Information technology and Education

The world has evolved and we are now living in the age of nuclear weapons and silicon chips. This is also the age of computers and information technology, commonly referred to as the 'e-age' (Davide, 2007). Thus, the integration of information technology in education i.e. in teaching and learning is a central matter in ensuring quality in educational system

There are two equally-important reasons for integrating information technology in teaching. 1) Students must become familiar with the use of information technology, since all jobs in the society of the future will be dependent on it, 2) information technology must be used in teaching in order to improve its quality and make it more effective.

Regarding this Elizabeth(1996) noted that the use of technology in education has advantages to help being bridge the ever-winding gaps between schools and society and also in accomplishing educational visions. She further indicated that the use of technology in education will make the students to be better citizens, better consumers, better communicators, and better thinkers- better people.

The implementation of information technology in education has great potential on changing the mechanism of the role of teachers and learners activities. As cited in Elizabeth (1996), Leslie (1994) puts it as follows: " One consequence of the information explosion is that teachers can't know everything of value to their students, but with the aid of

telecommunications, they often can guide students to the information they seek” and O’Donnell (1996) says much the same thing ,”The real roles of the professor in an information rich-world will be not to provide information but to guide and encourage students wading through deep waters of the information flood”.

According to Tissue (1997), the common rationale to incorporate information technology in education provides the following advantages:

1. Improved learning effectiveness
2. Greater access to information
3. Graduates need computer and information skills to be competitive in the job market
4. Increased productivity
5. Sharing of resources and courseware
6. Greater access to education via distance learning e.g. Enables new method to deliver education, including continuing education, to open new markets and consolidate educational institutes.
7. External forces-competition for students, pressure from parents, students and public funding sources

Thus the use of the advance technology in education has potential in constructing new and richer contexts for teaching and learning.

2.4. Information Technology in TVET

The information age is changing the way we work, we live and may be even think. Some jobs are disappearing, others are emerging and still others are being rapidly transformed by information technology and information based economy. But the information age is not just affecting the work place. Its influence is felt in our educational system, too (Tom, 1987; Alex and Mathew, 1999). The new jobs that will be created with the introduction of information technology can not be staffed by the people who have been displaced (Arthur, 1985). That means, the information age clearly makes new demands on the educational system, requiring radical

changes in what and how people learn and take training to cope up the change.

In relation to the purpose of vocational education and its content alongside with the necessary practical skill , successful trainees need to acquire responsibility, creativity, team working skills, independent thinking, flexibility, ability to solve problems and ability to obtain and process information. To achieve these goals information technology based education should be implemented in the educational process (Odd as cited in UNESCO, 2003, 45). Similarly Tierk, as cited in UNESCO(2003), wrote that TVET is the place where trainees are preparing for occupation. The objective of the training institute is to develop the competence they need to start a professional career in a specific job. So the use of information technology in the education system has great role in the organization of TVET.

In TVET institutes different occupational courses are offered. Therefore, the TVET institutes need to facilitate to trainees a favorable learning environment to acquire the competency needed to objectives. Through IT, teaching and learning can be provided at a lower cost. It supports learner-centered TVET delivery, improves access to information and knowledge and allows for self and self-paced learning and testing (National TVET strategy, 2006: 26).

The provision of information technology in TVET has many advantages. It is useful

1. to cater the educational experience to particular type of trainees and their respective requirements ; tailor made education
2. to provide timely and effective communication between the institute and the trainees
3. to allow both real time access to a trainee's educational progress as well as to the products they have developed during their training

Furthermore, the use of information technology in TVET can be classified into four main categories, namely: (1) technical assistance for teaching; (2) teaching tool; (3) a work tool for students; and (4) system control tool or workshop or laboratory tools (Chomienne as cited in UNESCO 2003).

2.5 The Concept of Curriculum Implementation

Curriculum is the way content is designed and delivered (Shiundu and Omulando, 1992). For curriculum development, the ultimate goal is not to design the best and ideal curriculum, but to put it into practice successfully. That is why implementation serves as one of the elements of curriculum development. Thus, implementation is a phenomenon that helps to integrate the curriculum in to existing practice. From this, one can understand that curriculum and implementation are interrelated or interdependent one to the other. Supporting this Derbissa(2004) demonstrated that without curriculum there is no implementation and with out implementation the curriculum material has little meaning.

There are different factors that facilitate or hinder the implementation of curriculum. According to Fullan(2001:72) the major three factors are 1) the characteristics of innovation or change 2) local or Institutional factors and 3) external factors. Regarding this different scholars including Pratt(1980) forwarded in their literature those factors like human resource related, material resource related and institutional related factors.

Curriculum implementation entails putting into practice the officially prescribed courses of study, syllabuses and subjects. The process involves helping the learner acquire knowledge or experiences. It is important to note that curriculum implementation can not take place without learner. The learner is therefore the central figure in the curriculum implementation process. Implementation takes place as the learner acquires the planned or intended experiences, knowledge, skills,

ideas and attitudes that are aimed at enabling the same learner to function effectively in a society (Tichafa and Rhodrck, 2000).

Brown (1982:36) has stated that, of all the personnel involved in curriculum implementation, the teacher is almost certainly the most important. That means it is the teacher who translates the interaction through the multimedia of activities occurring both inside; and outside the class room. Therefore, from these points one can say that the teacher is the corner store of curriculum implementation. Additionally, teachers and principals by far the most important who determine the success of curriculum implementation in school(Pratt, 1980).

The internal resources are other factors that determine the successful implementation of an innovation. Material resource may include instructional materials, instructional facilities, infrastructural facilities, technological facilities, equipment etc. Supporting this Kinder (1995:53) asserts that teaching materials are device which can be used to make learning experience more concrete. Additionally, Kemmerer (1994) stated that school facilities and equipment are used as one of the indicators of educational system efficiency.

On the other hand, lack of such material resources may affect the implementation of the new curriculum. For example, UNESCO (1999) in the study of Sub Sahara Africa Education demonstrated that there is prevalent gap between the intended and observed curriculum. This gap is due to lack of teaching materials and facilities.

Therefore, the teacher, the learner, the principals, the resource materials and facilities are the common factors that influence the curriculum implementation

2.6. Factors Enhancing/Hindering Implementation of Information Technology in Education

Educational technology, especially computers and computer-related peripherals, have grown tremendously and have permeated all areas of our lives. The modern way of providing information technology courses is directly depends on the use of these computers and other information technology tools. When we are using the educational technology in educational institutes we need to know how to use it properly. This is because there are different institutional factors that enhance or hinder the implementation of information technology in education.

Different researches have done on identifying different factors that have effect on the implementation of information technology in different levels of education. Posner (1995) identified seven areas, called “frame factors” that can affect curriculum implementation. He listed them as temporal (time, quantity, frequency, duration scheduling), physical (environment, material and equipment), political-legal, organizational (administrative factors), personal (attitude, interest of student, staff, parents), economic and cultural. Similarly Roszell (1995), as sited in Ron(1998), noted factors that have effect on the implementation of information technology in schools. These are: access to computers; availability of software; self motivation; confidence and skill; the amount of time available for software review and teacher preparation; availability of hardware; attitudes of administrators; and teachers’ education and training. Some of the common factors that enhance or hinder information technology training in educational institutes will be discussed. These are time factors, availability of hardware, software issues, attitudes of administrators, and pedagogical issues.

2.6.1. Time Factors

The time factor surrounding the implementation of IT in education is viewed as one of the barriers. That is, time has its own effect in the utilization of information technology in education.

Posner (1995) and other writers indicated that time factor is critical issue in implementing IT courses in education. That means, time is useful for teachers:

1. to experiment with new technology,
2. to share experience with other teachers,
3. to plan lessons with technology,
4. to attend technology courses and meetings,
5. and also access of hardware and software.

Additionally time also has impact on preparing the lesson deeply, to follow up the trainees' activities in computer lab, providing assistance and troubleshooting the problems of computers. For many teachers, time especially instructional time is seen as their most precious resource.

2.6.2 Availability of Hardware and Software

Issues surrounding computer hardware are the most serious barriers affecting implementation information technology in education. That is, if the number of hardware available is not proportional to the number of trainees which are attending information technology courses, it will have its own effect on the implementation.

In line with this, Middleton, Flores and Knaupp (1997) as cited in Ron (1998) stated that, not proportional student-to-computer ratio may make trainees not to practice and understand well in the computer lab. Failures of computers, lack of other additional hardware for training act as barriers to implementation of IT. Poor or limited accessibility of hardware prevents effective provision of IT courses in training institutes. When there are large number of hardware, like computers, printers, and other information technology tools in computer lab, many trainees can get chance to access and practice the lesson provided in the computer lab.

Lack of availability and access to software is also one of the factors being a serious barrier that has negative effect on information technology course classes. The availability of appropriate software facilitates and enhances the teaching and learning of technology classes.

2.6.3. Attitudes of Administrators

Lack of support by administrators is identified as a significant barrier toward implementation of information technology courses in classrooms. Tichafa and Rhodrcek(2000) indicated in their module 13 that curriculum implementation can not be achieved unless it has been made possible through the supervision function of the school director. That means the directors can support the technological professional development of teachers by establishing flexible schedules so that teachers can practice what they have learned (or to continue their learning) encouraging and facilitating team teaching and peer coaching, allowing teachers to visit each other's classrooms to observe computer technology integration; and scheduling regular meetings among teachers using technology to plan and evaluate instruction..

2.6.4. Pedagogical Factors

The role of individual teachers can affect the implementation and the educational appropriateness of information technology courses. Supporting this Galligan as cited in Ron (1998) says: It is their (teachers) choices how, when, why and to whom that to determine whether or not information technology trainings are beneficial. The versatility of the way of providing information technology course is varied in the way of approach and explanation of each teacher. Effective teachers are teachers who make effective choices about why they are facilitating the necessary teaching material for the provision of the courses.

2.7. The Need for Qualified and Experienced Trainers in TVET

Institutes

TVET has to respond to the skill needs of the labour market and create a competent, motivated and adaptable workforce capable of driving economic growth and development (MOE 2006:5). For this middle level TVET institutes need qualified and experienced teachers/trainer. Therefore, trainers in TVET institutes in general and particularly

information technology course teachers need to have the required qualification to train.

Supporting this World Bank (1986), has stated that the quality of any training program is determined to a very large extent by the personal qualities, professional competence, attitudes and insights of trainers.

According to Andreas (1998) and MoE(2002:51-52) the middle level vocational training teachers should be

1. graduated from Teachers Training Colleges with a degree in the respective technical and vocational field,
2. capable to train vocationally in one field without further training and make them (the trainees) skilled workers, and.
3. capable to make trainees help themselves to be able to establish their business, maintain machinery and others.

Since vocational training is dynamic in its nature, and also there is an increase in development of technology, attention need to be given for skill development of trainers to raise the level of education and training, to improve its quality and diversify training provision. Specifically, the information technology courses are more of new for trainers and trainees in our country.

To couch-up the technology, refreshing and up-dating trainers is important. The TVET institutes in which they are serving can play important role in facilitating skill development for trainers. Supporting this Adane(2002) indicted the following benefit of providing training for teachers. 1) Increased productivity 2) heightened morale 3)reduce supervision and 4) increased organizational stability.

The quality of TVET program depends largely on the professional competence, personal quality and attitudes of teachers (UNESCO/ILO, 2001:16). Therefore, for implementation of information technology in

TVET institutes information technology course teachers need to have competency in their lesson plan preparation, interest or commitment and also need to have knowledge and experience.

Teachers of technical and vocational education for occupational fields should have significant experience in the exercise of practical skills, special preparation for teaching adults, the knowledge of the working environment of the learners (UNESCO/ILO, 2001:40). This helps experienced teachers to know the backgrounds of the trainees, the problems and the experiences of trainees and the type of misbehavior and discipline problems that would occur.

Teacher's responsibility extends not only to the technical, but also to the personal, development of the trainees. They are responsible, too, for facilitating and cooperating for the provision of career guidance services, following the apprenticeship programs, working together with management (Robert, 1995).

2.8. The Efficiency of Management in TVET Institutes.

The TVET institutes have great responsibility for the actual development of TVET delivery and its linkage with labour market .The aim of the Ethiopian TVET system is to grant far-reaching planning and management responsibilities to public institutes (MOE TVET strategy, 2006:18). For the fulfillment of such an aim TVET institutes' management and principals have great role. They can help to improve teacher's morale and motivation, encourage the development of confidence and professional developments amongst teachers, increase teachers' participation in decision-making and developing a sense of control over their own work, and identifying the resources and facilities needed to support teachers.

According to Dunham(1995:32) effective management means the optimum use and development of resources such as people, money, buildings, materials , time and space.

The importance of developing the skill of decision making needs to be stated very strongly, because all activities of the school are dependent on the decision making skills of managers. When these skills are poor the consequences for staff can be quit negative. So according to Dunham (1995:65) there are eight important indicators of effective and successful decision makers. They are clear about objectives, good communicators, good listeners, good time managers, ascertain all the facts of the situation, consider all possible options, consult those affected by the decision, and are flexible before the decision and firm after it.

Stacey and Norman(1996) noted in their monograph about the role of principals in curriculum implementation saying that principals, as curriculum leaders, must provide direction and support to teachers. They must provide direction in helping teachers identify, select, and develop programs and materials that meet student needs within the context of the school's vision and mission. Principals also need to ensure that teachers have the time, resources, and professional development opportunities to implement curricula programs. This is because even the best official curriculum is worthless unless it can be successfully put into operation by the teachers.

All modern managers essentially face three managerial tasks: managing work and organization, managing people and managing production and operation (Donnelly, 1992:14). Therefore, management and principals of TVET institutes need to make sure that the work of the institutes gets done, programs must be planned and classes scheduled, trainees must be advised, and classes must be taught.

2.9. The Role of Middle Level Institutes in Facilitating Apprenticeship

Apprenticeship training is the oldest system of transfer of skill from Artisan to a learner. Father used to train his son in his workshop by way of on-the-job training and transferred skills so that the son could become an artisan and be able to train his living by running father's business..

The term apprenticeship and apprentice are currently used by different agencies for different types of skills training. But MOE (2002:90-92) refers apprenticeships for industrial attachments of students from TVET schools. Apprenticeship is a way of combining practical experience with theory. This experience helps the trainee to be a skilled worker. Supporting this Andreas (1998:71) says that:

...with the increasing importance of the private sector, an appropriately promoted and strengthened enterprise based apprenticeship program has the potential to increasingly contribute to meeting vocational training and skill development needs of the country.

The best advantage of apprenticeship training is its vicinity to the world of work. Trainees are systematically exposed to the world of work and learn the occupational practice in a real life situation (MOE TVET strategy, 2006:24).

In Middle Level TVET Institutions, the training given covers the results of both the training in the institutes themselves and in the organization in which the trainees take apprenticeship. Now a day in our country TVET institutes at least 20% of the result of the over all training is given to the result that is achieved in the apprenticeship. For such training, TVET institutions have great role in preparing and facilitating the apprenticeship. Supporting this, MOE (TVET strategy, 2006:25) noted that maximum flexibility is given to TVET providers to negotiate and develop relationships with individual employers, and group of employers.

Furthermore, the middle level TVET institutes need to take careful preparation by providing awareness to the trainees about the tasks that need to be done in the apprenticeship. This is mostly done by vocational counselor or coordinating committee that is organized to facilitate assigning of the trainees to different organizations for apprenticeship.

According to the document Federal Negarit Gazeta (2004) responsibilities of TVET Centers include the following:

1. Provide theoretical and practical lessons as specified in the schools training plan;
2. assign an apprenticeship coordinator
3. evaluate apprenticeship
4. develop together with enterprise/workshop systematic apprenticeship

So based on the above rules the vocational counselors and the assigned committee have responsibility to develop a mechanism for disseminating information about the rules and to facilitate the apprenticeship that is directly related to training that is taken in the courses of the TVET institutes. In relation to this UNESCO/ILO (2001:35-36) recommend that vocational guidance counselors need:

1. to follow the trainees progress through their training program
2. supplement the programmes by short periods of work experience and study of real work situations
3. ensuring that all necessary information concerning the world of work and career opportunities is available, and actively disseminated using all available forms of communication

Therefore, the middle level trainees, including information technology course takers, need to take apprenticeship in the areas in which they can practice that directly related with the training that have been taken in their institutes and also need to help them to prepare for their future occupation.

2.10. Country Experiences

For the development of their national economy countries in the world give more attention in promoting education. This is because education is the key for development. Specially technical and vocational education is necessary to provide knowledge and skills required to exploit the natural resources of the country through scientific and technical discovery. Now a days, developing countries in the world, including Africa, are taking different reforms in their educational system, introducing information technology, to meet their national educational objectives.. So countries are trying to put their effort in the mechanisms of adopting information technology to their educational systems. For the purpose of showing others experiences, reviews are made and presented below.

2.10.1. Tanzania's Experience

Tanzania is located in East Africa that gained independence in 1961. The Tanzanian educational system is based on the 7-4-2-3 system: 7 years of primary school, followed by four years of secondary school leading to Ordinary Level (O-level), followed by two more years leading to the Advanced Level (A-level). After those two years a student can complete the Bachelor's degree in three years (Frida, 1999).

For the development of education in the country the Tanzania government developed the Education Sector Development Program (ESDP) in 1995. One of the main objectives of this program is to promote science and technology by intensifying technical and vocational education and training (Frank, 2007).

In addition, for successful utilization of its national resources Tanzania developed its TVET policy in 1996. The main policy objectives of TVET in Tanzania are:

- a) To establish, maintain and consolidate training institutions by equipping them with sufficient manpower and facilities for high quality training to meet their specific objectives;

- b) To ensure that, there is a free flow of information between training institutions, government parastatal organizations, and any other organizations offering technical education and training;
- c) To ensure that technical education and training at all levels of education is properly integrated with the national economic development programmes;
- d) To promote a self employment culture through entrepreneurship education development;
- e) To ensure that, the national technical education and training standards match with international standard classification of occupation;
- f) To improve the employment conditions for teachers/lecturers in technical education and training system in order to attract and retain qualified personnel (TVET policy of Tanzania, 1996).

To integrate technology to education, the need of information technology policy is unquestionable. The government of Tanzania also has been trying the process in formulating informatics technology policy.

By believing the use of ICT in enhancing education and improving the quality of delivery of education in all areas, the Ministry of Education of Vocational Training of Tanzania formulated the national ICT policy of 2003 to guide the integration of ICT in basic education..

The main activities of the Ministry of Education of Vocational Training was in facilitating and

1. formulation of ICT policy for basic education
2. has launched a nationwide project for ICT development in teacher education
3. forming an eSchool form to design a programme supporting the introduction and use of ICT in secondary education
4. establishing a curriculum for ICT in primary and pre-primary education

5. providing authority for ICT development at the vocational Education and Training Authority .(ICT POLICY, 2007)

Therefore, from these points one can see that Tanzania gave great attention for the development of TVET and integration of information technology to its all level of education.

2.10.2. Botswana's Experience

Botswana, republic in southern Africa, is a landlocked country. It has a 7-3-2 education system (Primary school, Junior Secondary School and Senior Secondary School). The Government offers 10 years of universal and free education. After their basic education, the students can join to the vocational training in three ways.

Basic Education (10 years) —————> to BTEP (Botswana Technical Education Program) for 3 years

Basic Education (10 years) —————> to Apprenticeship industrial training for 4 years

Basic Education (7 years) —————> to Brigades for 3 years (World Bank, 2002:26).

One of the strengths of the education and training system in Botswana is the availability of a policy document to direct its activities. National Vision 2016 provides a long-term strategy within which education and training have a pivotal role: the vision states that “Botswana in 2016 should be an educated, informed society “ and , in achieving this , must “join the information age”, “gear the education more to the job market”, “set highest possible standards for vocational and technical training “ and increase “ the range off technical and vocational choices that are available to all people”. (David and Andre, 2002:211)

The Vision for TVET as declared by the Department for Vocational Education and Training is reads: “ to have a competent, innovative and internationally competitive National Human Resource with ability to

contribute to the socio-economic and technological advancement of the country”(MOE Botswana, 2001:7).

Botswana gave attention in providing information technology in its educational system. The Revised National Policy on Education (1994) recommends that all students should be exposed to computer awareness during their stay at school and also all senior secondary school teachers acquire computer literacy. For facilitating the implementation, the department of Teachers Training and Development of the country provided short and long term arrangement for training of trainers (David and Andre, 2002:24) .

In Botswana the computer education also implemented in Technical and Vocational Training centers. Four main groups ("bodies") have direct influence on Computer Education and Training within the Department of Vocational Education and Training of the Ministry of Education.

- a. The staff in the front line.
- b. The "Advisory Group-Computer Education and Training" in the Department of Vocational Education and Training
- c. The Sub-Committee "Computer Education and Training" of the Trade Advisory Committee "Administration, Business and Commerce".
- d. National Committee for Computer Education and Training-a Subcommittee of the Government Computer Steering Committee (Magetse, 1999).

2.10.3. Czech Republic's Experience

The Czech Republic is a landlocked country in Central Europe and a member state of the European Union. Its educational system is based on the 9-4-4 system: 9 years of primary basic school(include Gymnasium), followed by four years of secondary school including vocational schools, followed by 4 more years to the university Studies.

One goal of education at all levels in the Czech Republic is that students become involved as dynamic rather than passive participants in the

educational process. One way to do this is to allow them to participate in the solution of complex problems from the real world by undertaking class projects, often working in teams. For this implementation Czech Republic use “just-in-time” teaching model. The major elements of this model are:

- a long term and complex information technology project;
- a collaborative project team;
- the development of ‘just-in-time’ learning modules for students;
- a project unbounded by semesters;
- continuous measurement of the effectiveness of the project

The Ministry of Education of the Czech Republic established some goals for providing IT in secondary schools. The following are some of the specific aims for the subject of information technology taught at secondary schools:

- To learn the basic concepts of informatics, as a scientific discipline of the rules of the origin, transmission, recording, transformation, presentation and use of information;
- in an era of ever increasing information, to be able to find one’s way in information resources, and to learn how to select the substantial from the insubstantial (UNESCO, 2004).

In implementing information technology in schools, Czech republic gave attention to teachers training. There is a lot of in-service training in ICT available for teachers in the Czech Republic. The training is generally delivered by universities, some of it online. In the Czech Republic there are also different forms of pre-service training in informatics. Informatics teachers are trained in specialized faculties. These teachers are prepared to teach mainly in secondary schools, where the subject of Informatics is obligatory

According to Karel’s (2001) report, Czech Republic pass different steps to the development of its information technology policy. In the year (1990-1998) due to lack of coordination there was no general nationwide policy, no citizen focus and no modern legal framework. But in the year (1998-2001) different steps had been taken towards coordination of information

technology policy. In April 2000 the Czech Government ratified the State Information Policy in Education (SIP). The policy include the following points:

1. achieve information literacy by all school-leavers from basic and secondary, integrated and vocational schools by 2005
2. establish at least one special classroom equipped with quality multimedia computers at each school
3. education of teachers to administer computer networks using the modern ICT for teaching

Lesson Learned from the experiences of other countries

- Great effort for the integration of information technology to all level of education
- Facilitating pre-service and in-service training for information technology trainers
- Developing and modifying different information technology policies.
- The use of “just-in-time” model for the implementation of information technology in secondary schools.

Chapter 3

Research Design and Methodology

3.1. Introduction

This chapter describes the research methodology employed in the study, including data collection method, data collection instruments, research population and the method of sampling and methods of data analysis.

3.2 Research method

The study focuses on assessment of institutional factors affecting implementation of information technology training program in government middle level TVET institutes in Addis Ababa.

A descriptive survey method was used for this study. Because, it seeks to gain insight into a phenomenon as a means of providing basic information from gathering several kinds of data in an area of the study. The method also enables to examine the present status of institutional factors affecting the training. Hence, in describing the existing institutional situation of IT training, a descriptive survey method was found to be relevant and appropriate for this study.

3.3. Data collection methods and techniques

3.3.1 Participants

According to Lokesh (1996), a population is defined as all elements (individuals, objects and events) that meet the sample criteria for inclusion in a study. The target population of this study was the five government middle level TVET institutes' trainees, trainers, principals, vocational counselors, supervisors in Addis Ababa

3.3.2 Sampling techniques

Sampling is a procedure of selecting a part of a population on which research can be conducted, which ensures that conclusions from the study can be generalized to the entire population. Purposive, stratified,

and simple random sampling techniques were employed to select samples from government middle level TVET Institutes.

In Addis Ababa, there were five government middle level TVET Institutes in which information technology training courses were provided. In order to assess the institutional factors affecting IT training widely three (60 percent) middle level Institutes were selected using purposive sampling technique. Kefitegna 4 TVET Institute was the first. Because, it was the place where the researcher was working and the problems were observed. The other two TVET Institutes were also selected purposively because of having relatively more number of trainees and also locating in different sub-cities of Addis Ababa.

In order to ascertain representation, out of the total 1038 trainees, 312 (30 percent) of the existing total number were included in the study.

Stratified random sampling techniques were employed to determine the proportion of trainee participants to be selected from each department of selected institutes. The total number of trainees of each institute was divided in to their fields of study and sections proportionally. Then, simple random sampling technique was employed to determine the number of participants from each field of study. Simple random sampling technique is appropriate for this sampling because it gives equal chance and opportunity to all trainee participants in the sample.

From selected Institutes, out of nine principals and deputy principals, six (60 percent) principals were taken using purposive sampling techniques to participate in the sample. Finally all Information technology trainers, 3(50 per cent), vocational counselors and all TVET supervisors were also included in the sample.

3.3.3 Sources of data

The data for the study were obtained from both primary and secondary sources. The primary information were gathered from trainees, trainers, principals, vocational counselors, and supervisors of all government

middle level TVET institutes in Addis Ababa through questionnaires, interview and observation. For secondary source legal documents and attendances were consulted to be the bases of the study.

3.3.4 Instruments

In order to get first hand information, primary data was collected from the participants through questionnaire and interview. A self-administered questionnaire was chosen because it helps the respondents to respond honestly. Observation was the other method that was used additionally.

Two types of questionnaires were used for data collection from trainees and trainers. This is to get different views from different perspectives of respondents about institutional factors affecting IT training. The questionnaires included mainly close-ended questions and a few open-ended items. In the open ended questions, the participants were required to respond in writing, whereas closed-ended questions had options which were determined by the researcher.

The questionnaires were prepared in English which latter had been translated into Amharic to make it fit to the trainee respondents. In order to get additional information and top authorities' view, interview was prepared for the institute principals, vocational counselors and TVET supervisors. Moreover, using Check list systematic observation was taken to get factual information about institutional facilities that were serving for information technology training.

3.3.5 Procedure of data collection

Before dispatching the questionnaires for actual investigation the researcher pre-tested the instruments to 35(30 trainees, 2 trainers and 3 from others) similar participants in Akaki Middle Level TVET Institute, which had not been included in the sample of the study. Based on the feedback obtained from the sample respondents necessary corrections

have been made. Two questions were corrected in the following manner. The first correction was changing Q12 of trainees questionnaire to the appropriate rating scale from the form (Strongly disagree—Strongly Agree) to (Very low—Very high). The second correction was changing of Q16 from the form “Is there orientation time that explain how and when to take apprenticeship? ”, to the form “Is there orientation time to the trainees that explain how to be involved in apprenticeship?” Similarly, on interview guide lines some slight modifications were also made.

After making corrections on the instrument items, distribution and continuous follow up had been made. This help to maximize the quality of response and the rate of return. Then, observation of facilities of the training institutes had been taken with the help of check list.

3.3.6. Methods of data analysis

After collecting data from respondents different descriptive statistics tools were employed for presenting and analysing the data in the study. The respondents were categorized and frequencies were tailed. Hence, the following basic statistical techniques were used to analyze the study.

1. Percentage and frequency counts were employed to analyze various characteristics of the sample population. These statistical tools help to determine the relative standing characteristics such as age, sex, work experience, academic qualification and field of specialization. It was also used for other questions with ordinal and nominal character.
2. Weighted Mean was computed to find out average value of the factors affecting the implementation of IT in TVET institutes. Based on the mean value, rank orders were established according to the magnitude of their importance. Finally Spearman’s rank order of correlation coefficient were also used to identify the existence of view agreement between groups.

Chapter 4 Presentation and Analysis of Data

4.1. Background of the Participants of the Study

Based on the response obtained from the participants of the study, background characteristics like sex, age, service years, qualification, and major fields were presented and analyzed.

Table 1. Characteristics of the Respondents

No	Items		Trainers		Trainees		Principals	
			No	%	No	%	No	%
1	Sex	Male	7	53.8	152	48.7	6	100
		Female	6	46.2	160	51.3	-	-
		Total	13	100	312	100	6	100
2	Age	20 or below	-	-	302	96.8	-	-
		21-25	2	15.4	10	3.2	-	-
		26-30	3	23.0	-	-	-	-
		31 -40	2	15.4	-	-	-	-
		41-50	6	46.2	-	-	5	83.3
		50 or above	-	-	-	-	1	16.7
		Total	13	100	312	100	6	100
3	Service years	1-5	2	15.4	-	-	-	-
		6-10	3	23.0	-	-	-	-
		11-15	2	15.4	-	-	-	-
		16-19	2	15.4	-	-	1	16.7
		20 or above	4	30.8	-	-	5	83.3
		Total	13	100	-	-	6	100
4	Qualification	Certificate	-	-	-	-	-	-
		Diploma	8	61.5	-	-	-	-
		Bachelor degree	4	30.8	-	-	6	100
		MA/MSC	1	7.7	-	-	-	-
		others	-	-	-	-	-	-
5	Work Load Per week	1-13	1	7.7	-	-	-	-
		14-20	5	38.5	-	-	-	-
		21-26	7	53.8	-	-	-	-
		26-35	--	-	-	-	-	-
6	Major fields of training	Computer Science	5	38.5	-	-	-	-
		Business Education	3	23.0	-	-	2	33.2
		Mathematics	1	7.7	-	-	-	-
		Information Technology	2	15.4	-	-	-	-
		Accounting	2	15.4	-	-	-	-
		English	-	-	-	-	1	16.7
		Chemistry	-	-	-	--	1	16.7
		Psychology	-	-	-	-	1	16.7
Sociology	-	-	-	-	1	16.7		

As indicated in table a total of 312 trainees were involved in the study. Out of these numbers 152 (48.7 per cent) were males and 160(51.3 per cent) were females. The data reveal the existence of no discrepancy between male and female trainees in numbers from the sample population to participate in the study. Additionally, since the assignment of trainees to government TVET institutes depends on the 10th grade EGSEC result; this might indicate that the larger number of females in TVET institutes showed their low academic result of lower grades or their preference.

Regarding trainees' age, 302(96.8 per cent) was found in the age category of 20 or below. The data showed that almost all of the respondents were found in the appropriate age to fit the respective educational level.

Regarding the trainers under the study, 7(53.8 per cent) of them were males and 6(46.2 per cent) of them were female. This shows that the involvement of female trainers, in the teaching of information technology courses, were almost nearer to the number of male trainers in government middle level TVET institutes under study.

With regard to the trainer respondents' qualification, majority of them i.e. 8(61.5 per cent) were diploma holders, 4(38.5 per cent) were first degree holders and one with M.A. Additionally the data on Table 1 indicated that from the trainer respondents 7(53.9 per cent) of them were with major field of study in computer science and information technology, which has direct relationship with courses of information technology. But the remaining 6(43.1 per cent) were with major field of study in Mathematics, Accounting, and Business Education which had not relatively direct relationship with courses of information technology. These conditions are contrary to the criteria set to teach in middle level TVET institute that need the qualification of first degree in one of the fields of training (Andreas, 1998; MOE, 2002).

When we see the experience of the trainer respondents under study, 2(15.4 per cent) of them have served between 1 and 5 years, 3(23 per cent) of them have served between 6 and 10, 2(15.4 per cent) of them have served between 11 and 15 years, while the remaining 6(46.2 per cent) of them have served above 16 years in teaching profession. This indicated that the majority of the trainers of information technology in the middle level institute under study had adequate experience in teaching including other subjects. Teaching experience is helpful in managing the class atmosphere, how to plan the training from beginning to end the way how to evaluate trainees' activities.

Regarding the work load of the trainer participants of the institutes under study, as indicated in table 1, 1(7.7 per cent) of them had average load between 1 and 13, 3(38.5 per cent) of them had the average load between 14 and 20 periods per week and the remaining 7(53.8 per cent) of them had average load between 21 and 26 periods per week. In government middle level TVET institutes the maximum load per week allotted was 35 periods each had 50 min. From this we can say that the trainers of the institutes under study might not have enough time to prepare for themselves, and to participate on other institutional duties.

Regarding the principals of the TVET institutes under study, as indicated in Table 1, all of them were male. From this one can say that the participation of female in the managerial position was low. Concerning their service years, the majority 5(83.3 per cent) of them had experience of 20 years or above. From the interview part of the principals the researcher noted that teaching had taken most of their experiences. Additionally Table 1 indicted that the major fields of all the principals (i.e. Business Education, English, Chemistry, Psychology and Sociology) were not directly related to the fields that was needed to manage TVET institutes (like Educational Management). This might have its own impact on the implementation of training in TVET institutes in general.

Finally, these all points mentioned above; i.e. experiences, working loads, qualification and major fields of study, were considered here because they have their own effect on the implementation of information technology in the institutes under study.

4.2 Respondents' Interest and Exposition to Technology

Early exposition and interest to technology have their own contribution to facilitate the implementation of IT training program. The following table includes respondents' responses on these issues.

Table 2 Trainee and Trainer Respondents' Exposition to Technology and Their Interest

1	Items	Trainees				
		No	%			
1	Have you ever used computer before joining this institute?	Yes	39	12.5		
		No	273	87.5		
		Total	312	100		
2	Do you have computer at home?	Trainees		Trainers		
		No	%	No	%	
2		Yes	10	3.2	9	69.2
		No	302	96.8	4	30.8
		Total	312	100	13	100
3	Do you have interest in IT courses training?	No	%	No	%	
		Yes	312	100	13	100
3		No	-	-	-	
		Total	312	100	13	100

The trainees of the institutes under study were asked whether they had used computer before joining their TVET institutes. As shown in table 2, 39(12.5 per cent) of them reported that they used computers before joining their institutes, and 273(81.5 per cent) of them not used computers before joining their institutes. This shows that the majority of the government middle level TVET institute trainees under study were not exposed to computer skill before joining to their institutes. Thus the institutes were expected to facilitate the proper implementation of information technology courses to meet the objectives of the courses.

Regarding item 2, the respondents (trainees and trainers) were asked whether they have computers or not at their home. As indicated in Table 2, 302(96.8 per cent) of the trainee respondents reported that they do not have computers at home. This indicates that the trainees of the middle level TVET institutes under study had no enough time and place except at the institutes to practice on computers for the lesson they learned from information technology courses.

4.3. Trainee and Trainer Respondents' Response about the Availability of Training Time .

For any training in TVET institutes in general, information technology in particular, the availability of time is very important. This is because, as indicted in the literature, the availability of time is important for trainers preparation of their lesson, and also for trainees to practice what they have been learned. Based on this the respondents were asked for the availability of time to practice IT training.

Table 3 Availability of Time to Practice IT Training.

No	Items	Alternatives	Trainees		Trainers	
1	Is the time of the training enough to practice IT courses in computer lab?	No		%	No	%
		Yes	31	9.9	4	30.8
		No	281	90.1	9	69.2
		Total	312	100	13	100
2	Respondents reasons for lack of time to practice IT courses in computer lab?					
2.1	There are less number of computer rooms	Strongly disagree	-	-	-	-
		Disagree	81	28.8	7	77.8
		Undecided	-	-	-	-
		Agree	130	46.3	1	11.1
		Strongly agree	70	24.9	1	11.1
		Total	281	100	9	100
2.2	There are less number of working computers In each computer rooms	Strongly disagree	16	5.7	-	-
		Disagree	45	16.0	3	33.3
		Undecided	-	-	-	-
		Agree	165	58.7	5	55.6
		Strongly agree	55	19.6	1	11.1
		Total	281	100	9	100
2.3	Trainers were not using the time effectively as expected	Strongly disagree	21	7.5	-	-
		Disagree	50	17.8	6	66.7
		Undecided	-	-	-	-
		Agree	170	60.5	2	22.2
		Strongly agree	40	14.2	1	11.1
		Total	281	100	9	100

As indicated in the table, 281(90.1 per cent of the trainees) and 9(69.2 percent of the trainers) reported that there is no enough time to practice in the computer lab. For this the respondents were also asked the reasons why they have no enough time to practice in computer lab. The majority of the trainee respondents reported, as indicated in table 3, that less number of the computer rooms, less number of working computers in each room and trainers not using the time effectively as expected were the reasons for the inadequacy of the time of training in computer labs. On the other hand, the majority of the trainers showed their disagreement for inadequacy of time for training in computer labs.

The possible sources of difference of opinions between trainers and trainees might be their understanding of time. Trainers perceive time in terms of the allotted time to the whole academic year, where as trainees perceive time as the contact they have with the trainers in computer labs and the proper usage of the training periods.

4.4. The Competence of Trainees and Trainers to their Duties

This section addresses the extent of the competence of trainees in information technology courses they have learned in the institutes and the competence of trainers to teach the information technology courses in middle level institutes.

Table 4. Trainees IT Skill Competency in Selected Activities

(using 1=Very poor 2=poor 3=fair 4=Good 5=Very good)

	Activities	Grand Mean
1	Basic Computer operating skill	4.45
2	Working on word processing	4.01
3	Working on spreadsheet	3.62
4	Presentation on power point	2.4
5	Working on database	2.28
6	Using Internet	2.05

As indicated in Table 4, the majority of the trainees under study reported that they were trained well in the basic computer skills, working on word processing and working on spreadsheet. But the majority of the trainees showed their agreement that they were not well competent or not well trained on power point, database, and using Internet. From these findings one can say that the trainees did not get sufficient training in some areas of information technology training.

Table 5 Trainers IT Skill Competency to the following Activities

(1=Very poor 2=poor 3=fair 4=Good 5=Very good)

	Activities	5		4		3		2		1	
		No	%	No	%	No	%	No	%	No	%
1	Working on office automation	10	76.9	1	7.7	-	-	2	15.4	-	-
2	Networking	1	7.7	8	61.5	-	-	4	30.8	-	-
3	Web page development	3	23.1	8	61.5	-	-	2	15.4	-	-
4	Programming	2	15.4	7	53.8	-	-	4	30.8	-	-
5	PC Maintenance	3	23.1	2	15.4	-	-	8	61.5	-	-
6	Working on multimedia	-	-	5	38.5	-	-	5	38.5	3	23.1

As indicated in Table 5, the majority of the trainer respondents reported that they were competent in working on office automation, networking, Internet service and web page development.

On the other hand the majority of the respondents confirm that they were not competent in PC maintenance and multimedia. The finding shows that the trainers do not have sufficient knowledge on teaching PC maintenance and multimedia courses. From this one can say that the trainers of the institutes under study need some in-service training in the areas in which they were not competent enough to provide the information technology courses. But from interview of the institutes' principals, supervisors and from the open ended questionnaire of trainers, the researcher noted that there were no in-service or short term trainings that were given to fill the skill gap that was shown on the competence of

the trainers. For the problem indicated, the participants gave the following reasons

Trainers reported that they asked the institute administration through their department on the need of short term training on some specific areas for which they were not competent. But, as they reported, they did not get any response.

Institutes' principals also reported on this issue saying that, the only thing what they were doing was transferring the trainer's questions to the respective sub-city educational offices. Supporting these idea supervisors reported that providing short term training was difficult to arrange for few trainers at a sub city level because of the expense it needs.

From these findings one can say that the incompetence of the trainers in some parts of the training and lack of in-service program or short term training to fill the gap may have its own impact on the implementation of information technology in the institutes under study.

Table 6 Trainees' Opinion to the Competency of their Information Technology Teachers (Using 5=Very high 4=high 3=Moderate 2=low 1=very low)

N=312

	Items	5		4		3		2		1	
		No	%	No	%	No	%	No	%	No	%
1	teaching experience	47	15.06	140	44.87	100	32.05	24	7.69	1	0.33
2	effort to cover the contents of the course	100	32.05	104	33.33	28	8.97	18	5.77	62	19.88
3	Providing exercise on each task and duties	-	-	40	12.82	72	23.08	194	62.18	6	1.92
4	To follow up each of the activities of the students	-	-	34	10.90	82	26.28	170	54.49	26	8.33
5	Frequently evaluating the activities of students	-	-	24	7.69	92	29.49	60	19.23	136	43.59
6	Knowledge of the subject matter	50	16.03	47	15.06	150	48.08	51	16.35	14	4.49

Among other things, the effectiveness of training program in general, information technology training in particular, depends to a large extent on the competence of the available human resources. As far as teachers' competence is concerned, UNESCO (1997) pointed out that the training staffs within Technical and Vocational Institutes need to be well qualified in both their area of specialty and pedagogical skill, and have sufficient and relevant experience. In connection to this, respondents were asked their opinion for the competency of information technology course trainers on some common activities.

In item 1 of Table 6 above, the respondents were asked to indicate their opinion about the teaching experience of their trainers. The majority of the trainees 187(59.93 per cent) reported that the information technology trainers of the institutes under study had high teaching experience.

Regarding item 2 of Table 6, the majority 204(65.38 per cent) of the respondents considered the effort of their trainers to cover the contents of the information technology courses as high. On other hand, 80(25.65 per cent) of the respondents pointed their trainers effort to cover the contents of the courses as low.

Concerning the duties of the trainer, like providing exercise on each task, following each activity of trainees and frequently evaluating the activities, the majority of the respondents, as shown in Table 6, have pointed as low.

4.5. Educational Materials and Facilities

Concerning the availability and adequacy of educational materials and facilities for the implementation of information technology training in middle level TVET institutes under study, the response obtained from respondents is presented in Table 7 and 8 below.

Table 7 Availability of Educational Materials for IT Training

	Item		Inade-quate		Barely adequate		adequate		Very adequate	
			No	%	No	%	No	%	No	%
1	Reference of materials(books)	TR	3	23.1	5	38.4	3	23.1	2	15.4
		Tr	52	16.67	100	32.05	160	51.28	-	-
2	Educational Software	TR	1	7.7	5	38.4	6	46.1	-	-
		Tr	92	29.49	150	48.08	70	22.44	-	-
3	Technology Journals	TR	2	15.4	7	53.8	4	30.8	-	-
		Tr	200	64.10	112	35.90	-	-	-	-
4	Internet access	TR	-	-	2	15.4	8	61.5	3	23.1
		Tr	88	28.21	190	60.90	50	16.03	84	26.92

TR=Trainers

Tr= Trainees

In item 1 of the table the participants were asked, if there are adequate reference materials that helped them in facilitating the implementation of information technology in their institutes. Most of the participants i.e. 8(61.5 per cent) of trainers and 152(48.72 per cent) of trainees reported that the reference materials were barely adequate or inadequate in the middle level training institutes under study.

Regarding item 2 and item 3 of the same table, most of the respondents reported that there were inadequate educational software and technological journals. Educational software is computer software that helps the trainees and trainers to learn and understand about some specific courses by themselves running in a computer. In addition, information technology training is dynamic in its nature. Thus, to be informed about the newly changing and updating conditions, the availability of technology journals are very important.

Regarding the last item on Table 7, for Internet access in the middle level TVET institutes, the respondents reported differently. The majority of the trainee respondents reported the barely adequate or inadequacy of the Internet access. On the other hand the majority of trainer respondents reported the existence of adequate access to use internet in their institutes. On the interview, the principals supported this difference by saying that because of the expensiveness of using internets of the institutes the internet rooms were permitted for trainers only.

Table 8 Availability of Educational Facilities for IT Training

	Item		Inade-quate		Barely adequate		adequate		Very adequate		Excellent	
			No	%	No	%	No	%	No	%	No	%
1	Institution building	TR	1	7.7	7	53.8	2	15.4	3	23.1	-	-
		Tr	31	10	250	80	31	10	-	-	-	-
2	Computer Laboratory	TR	2	15.4	8	61.5	2	15.4	-	-	1	7.7
		Tr	100	32	181	58	31	10		-		-
3	Library	TR	-	-	1	7.7	6	46.7	5	38.5	1	7.7
		Tr	178	57	106	34	28	9		-		-
4	Office for department	TR	12	92.3	1	7.7	-	--		-		-
		Tr	312	100		-		-		-		-
5	Chairs in rooms	TR	-	-	2	15.4	8	61.5	3	23.1	-	-
		Tr		-	63	20	218	70	31	10		-

TR=Trainers

Tr= Trainees

As can be seen in Table 8, the majority of the respondents indicated the barely adequate of the availability of facilities, like institution building, computer laboratories and libraries. That is the facilities seem sufficient to facilitate training in general and information technology in particular. Similarly the respondents reported the inadequacy of offices for department.

This indicate that the middle level TVET institutes under study were not adequately equipped with the necessary facilities that enable them to provide proper and quality training for all training in general and information technology in particular.

According to the personal observation of the researcher, almost in all sample institutes, the buildings were not attractive in colors, neatness, and handling the technology equipment in computer laboratories. But the library at Kefitegna 7 institute was handled in a very good way and has capacity to handle the institute trainees.

Finally, the absence or inadequacy of facilities in educational institutes in general in middle level institutes in particular, had its own impact on trainers' acquisition of knowledge. As a result, this condition hinders the provision of quality training in general and information technology in particular.

4.6. Institutional Factors Affecting the Implementation of Information Technology Training Program

There are different factors that can hinder the implementation of information technology in education. The major institutional factors affecting the implementation of training in TVET institutes are the competence of trainers, efficiency of management, the availability of educational materials and facilities (Assefa, 2006). Additionally, as indicated in the review of literature of this study, time factors, availability of hardware, and attitudes of management, are also have effect on the implementation of information technology in TVET institutes.

To assess these common factors which were expected to have influence on the implementation of information technology, opinions and responses were gathered from different participants of the study.

Table 9 The Degree of The Factors Affecting the Implementation of Information Technology in TVET Institutes (Trainees' perspective).

	Factors	Very Severely (5)	Severe (4)	Moderate (3)	Slightly (2)	Not At all (1)	Mean	Rank
1	Inadequacy of periods to cover contents of the course	24	96	144	30	18	3.25	7
2	Inadequacy of time to practice in computer lab	220	72	14	6	-	4.62	2 ✓
3	Inadequacy of technical support by teachers	240	72	-			4.77	1 ✓
4	Lack of competency skill of teachers to teach the courses	104	174	28	4	2	4.20	5 ✓
5	Large number of students in a class		35	95	86	96	2.22	10
6	Poor supply of facilities such as computers, Rooms, etc	48	120	120	24		3.62	6
7	Shortage of software's and reference books		72	144	72	24	2.85	8
8	Problems with internet access	192	96	24			4.54	3 ✓
9	Lack of support from directors facilitating the training	168	120	24			4.46	4 ✓
10	Lack of competency of directors to manage the training		48	120	144		2.69	9
Grand Mean=3.72								

As indicated in Table 9 inadequacy of technical support by teachers, inadequacy of time to practice in computer lab, Problems with internet access, lack of support from directors in facilitating the training and lack of competent skill of teachers to teach the courses were ranked high from first to fifth level having average mean of 4.77, 4.62, 4.54, 4.46 and 4.20 respectively. That means these are the major factors that affect the implementation of information technology in the middle level TVET institutes in Addis Ababa. According to the trainee respondents, the inadequacy of technical support by teachers took the top position in influencing the implementation of information technology. In the open-ended questions, the trainees also added that their information technology course trainers do not give them rooms to ask what the problem they faced. Even, most of the time, the trainers leave them in computer rooms. Therefore, most of the time they were working there what they want that did not have any relationship with the courses.

On the other hand, as indicated in Table 9, large number of students in a class, lack of competency of directors to manage the training, and shortage of software and reference books had slight influence on the implementation of information technology

Table 10 Factors Affecting the Implementation of Information Technology in TVET Institutes (Trainers' perspective).

	Factors	Very Severely (5)	Severe (4)	Moderate (3)	Slightly (2)	Not At all (1)	Mean	Rank
1	Inadequacy of periods to cover contents of the course	4	5	3	1		3.92	6
2	Inadequacy of time to practice in computer lab	8	4	1			4.54	2
3	Inadequacy of time to prepare lessons with technologies	4	3	2	2	2	3.38	9
4	Inadequacy of financial support to IT	5	4	3	1		4.00	5
5	Large number of students in a class	-	2	5	4	2	2.54	12
6	Poor supply of facilities such as computers,. Rooms, etc		3	6	3	1	2.85	11
7	Shortage of software's and reference books	5	3	2	2	1	3.69	7
8	Problems with internet access	7	4	1	1		4.31	4
9	Lack of support from directors facilitating the training	7	5	1			4.46	3
10	Lack of competency of directors to manage the training	9	3	1			4.62	1
11	Inadequacy of methodological training of IT		2	5	3	3	2.46	13
12	Lack of support from supervisors to implement IT	2	4	6	1		3.54	8
13	Absence or inadequacy of in-service training	2	2	5	2	2	3.00	10
Grand Mean=3.64								

As indicated in Table 10, the majority of the trainer respondents agreed on major problems that are affecting the implementation of information technology in the institutes under study. Lack of competency of directors to manage the training, inadequacy of time to practice in computer lab, lack of support from directors in facilitating the training, problems with

internet access and inadequacy of financial support to IT, were ranked at the first five top places with average mean 4.62, 4.54, 4.46, 4.31 and 4.00 respectively.

On the other hand, as indicated in Table 10, according to the trainer respondents Inadequacy of methodological training of IT, large number of students in a class, poor supply of facilities such as computers, rooms, etc, and absence or inadequacy of in-service training were among the factors that relatively had less effect on the implementation of information technology in the institutes under study.

4.7. Role of Middle Level Institutes In Facilitating Apprenticeship

Apprenticeship is training program that give chance of getting real world work experience for trainees. In Ethiopian TVET Institutes such program has its own part in the regular training program. Even it comprises 28 to 30 per cent of the total training needed to complete each specialization fields of training. For this the curriculum requires all regular program students to practice skills in actual working sites for 312 hours every year (MOE, 2003). Therefore, TVET institutes have their own part in facilitating trainees towards apprenticeship program.

The institutes responsibility and duties for implementation of apprenticeship was clearly stated in TVET proclamation. The proper facilitation of apprenticeship is considered as one of the institutional factors affecting in determining the extent of implementation of the training program. Thus, regarding this, opinions and responses were gathered from the concerned participants.

Table 11 The Extent of Participation of Institutes on the Apprenticeship Preparation

No	Items	Trainees		Trainers			
		No	%	No	%		
1	Is there orientation time to the trainees that Explain how to be involved in apprenticeship?	Yes	300	96.2	11	84.6	
		No	12	3.8	2	15.4	
		Total	312	100	13	100	
2	If your answer for item 1 above is "Yes", rank the extent of attention given point of discussion during the orientation time using from highest rank with number 1 to the lowest rank with number 5..	Mean		Rank	Mean	Rank	
		1 About the courses given in the institute	4.30	5	3.38	4	
		2 About trainees personal problems	3.51	4	3.54	5	
		3 About school compounds and rooms	2.74	3	2.92	3	
		4 About apprenticeship	2.33	2	2.38	2	
		5 About school discipline	1.54	1	2.15	1	
		With Spearman's rank order correlation coefficient $r=0.9$ The smallest the mean is the highest the rank. Because the The first rank is represented with the smallest number 1..					
3	Indicate the extent of participation of the following participants in facilitating apprenticeship in your institute	Trainees	Very high	-	-	3	23.1
			High	150	48.1	4	30.7
			Moderate	70	22.4	3	23.1
			Low	4	1.3	3	23.1
			Not at all	-	-	-	-
			Missed	88	28.2	-	-
			Total	312	100	13	100
		Vocational counselors	Very high	10	3.2	10	76.9
			High	170	54.5	2	15.4
			Moderate	60	19.2	1	7.7
			Low	-	-	-	-
			Not at all	-	-	-	-
			Missed	72	23.1	-	-
			Total	312	100	13	100
		Trainers	Very high	-	-	-	-
			High	90	28.8	-	-
			Moderate	80	25.6	5	38.5
			Low	100	32.1	2	15.4
			Not at all	-	-	6	46.1
			Missed	42	13.5	-	-
			Total	312	100	13	100
		Principals	Very high	30	9.6	-	-
			High	150	48.1	3	23.1
			Moderate	70	22.5	6	46.1
			Low	-	-	4	30.8
			Not at all	-	-	-	-
			Missed	62	19.8	-	-
Total	312		100	13	100		

In item 1 of Table 11, participants were asked whether there was orientation time while apprenticeship is explained. The majority of the

respondents (96.2% of trainees, 84.6% of trainers) reported the presence of orientation time in their institutes.

Consequently, the participants were asked to rank the types of points of discussion during orientation time. The trainees' institutional discipline case was ranked first by both trainees' and trainers' groups of respondents. Provision of orientation for apprenticeship is ranked second by both groups of respondents. Therefore, orientation on apprenticeship program was taken in second place. This means, relatively there is orientation time in which apprenticeship program is explained.

In order to test the variation between the two groups of respondents in ranking the extent of attention given for points of discussion in the orientation time, Spearman's rank correlation coefficient was used. It was obtained $r_s=0.9$. The value 0.9 approaches 1. It implies that there is a strong positive correlation between the groups of respondents in ranking the points of discussion during orientation time in middle level TVET institutes under study.

Regarding item 3 of the same table, participants were asked to rate the extent of participation of apprenticeship program facilitators in the institutes under study. Both participants reported high participation of trainees and vocational counselors in facilitating and arranging the place of apprenticeship. This is also supported by the institute's principals and the TVET supervisors. Especially, the vocational counselors have taken the major responsibility in coordinating and facilitating apprenticeship program as their main duty.

On the other hand, 100(32.1 per cent) and 150(48.1 per cent) of the trainee respondents agreed for low participation of trainers and high participation of principals respectively in facilitating apprenticeship program in the middle level TVET institutes under study. The institutes' principals and TVET supervisors also supported in their interview the

opinion of trainers' responses saying that there were no participation of trainers and medium participation of principals. This is because most of them considered it as the duty of the vocational counselors of the institutes under study.

Table 12 Trainers' Opinion to Apprenticeship Activities

(1=Strongly disagree 2=Disagree 3=Undecided 4=Agree
5=Strongly agree)

No	Items	1		2		3		4		5	
		No	%	No	%	No	%	No	%	No	%
1	The apprenticeship is directly related with the field of specialization of trainees	3	23.1	8	61.5	2	15.4	-	-	-	-
2	Apprenticeship providers evaluate properly the apprentice's activity	1	7.7	7	53.8	3	23.1	2	15.4	-	-
3	Teachers have chance to follow and give comment on the activities of their trainees in the apprenticeship program	2	15.4	7	53.8	2	15.4	1	7.7	-	-

In TVET institutes trainers have great role for the implementation of training in general, information technology in particular. So they need to train the trainees in the direction of the objectives of TVET.

In all cases, the majority of the trainer respondents showed their disagreement on the items mentioned in table 12. That means, 11(84.6 per cent) of them disagreed the direct relationship of the apprenticeship with the field of specialization of the institutes training program, 8(64.5 per cent) of them disagreed on the proper evaluation of the apprenticeship providers. Additionally, 9(69.2 per cent) of them reported their disagreement saying that they were not given chance to visit and comment the activities of the apprentices from their department. In similar way, the disagreements of the items were also supported by most of the principals and supervisors.

Chapter 5

Summary, Conclusions and Recommendations

This chapter presents a summary of main findings and conclusion drawn from the study. It proposes recommendations for action, areas for further study, to reduce institutional factors that affecting the implementation of information technology training in government middle level TVET institutes in Addis Ababa.

5.1 Summary

The main purpose of this study was to assess institutional factors affecting the implementation of information technology training in government middle level TVET institute in Addis Ababa.

In order to achieve the purpose, basic questions addressing institutional factors affecting implementation of information technology training were raised. They were related to the competence of IT trainers, efficiency of management, educational facilities and materials and the extent of institutional support in facilitating apprenticeship program

A quantitative descriptive survey design was used and it was conducted in three middle level government TVET institutes in Addis Ababa.

A sample of 312 trainees, 13 trainers, 6 principals, 3 supervisors and 3 vocational councilors were selected using stratified and purposive sampling techniques. The researcher used questionnaire, interview and observational check list to collect data from the participants of sampled TVET institutes. To increase the validity of the instruments, pilot test was made and the necessary follow ups were taken during data collection. Finally, by using statistical tools such as percentage, frequency counts, weighted mean and rank order were used to analyze the data.

From the data analysis the following major findings are drawn.

1. Although the education and training policy stipulates that trainers must have a minimum of first degree to teach in vocational institutes, the findings indicate that the majority of the trainers had college diploma. But, most of the trainers major fields of study were directly related to the courses they were providing in the institutes.
2. major fields of all principals were not directly related with the fields needed to the position they are working (like educational management).
3. Most of the trainee respondents do not have computer at their home and also most of them did not use computers before coming to the institutes. All of the participants have interest in information technology.
4. The time of training was not enough to practice in computer lab. Because there were less number of computer rooms, less number of working computers and in efficient use of time by trainers in computer lab.
5. The trainees in government middle level TVET institutes under study were competent on the courses like basic computer skills, working on word processing and working on spreadsheet. But they were not competent on the areas like power point, database, using Internet.
6. The trainers in government middle level TVET institutes under study were competent on the courses like office automation, networking, Internet service and web page development. But they were not competent on the areas like PC maintenance and multimedia. However, there was no planned program to provide in-service training for trainers.

7. According to trainees' opinion, trainers of information technology were not committed in providing exercise on each task and following each activity of trainees and there were not frequent evaluation.
8. In government middle level TVET institutes under study there were less number of reference materials, technology journals and less internet access for facilitating the implementation of information technology training.
9. The educational facilities (building, comp laboratories, libraries) were inadequate in most of the institutes under study. Additionally, almost in all sample institutes, buildings were not attractive in colors, neatness, and handling the technology equipment in computer laboratories.
10. There was no office for information technology department in which the trainers can prepare and practice their teaching lesson.
11. Inadequacy of technical support by trainers, inadequacy of time to practice in computer lab, Problems with Internet access, lack of support from principals in facilitating the training, lack of competent skill of teachers to teach the courses, lack of competency of directors to manage the training and inadequacy of financial support to IT were found as the major factors affecting the implementation of information technology in government middle level TVET institutes in Addis Ababa.
12. There was orientation time to introduce what apprenticeship is and poor mechanism of facilitating apprenticeship program.

13. Trainees and vocational counselors played great role in facilitating apprenticeship program. On the other hand the participation of trainers in coordinating and following the apprentices were very low.
14. The apprenticeship was not directly related to the field of specialization of trainees. There was no proper evaluation of apprentice, and there was no rooms for participating trainers to cross check apprentice from their department.

5.2. Conclusions

The study has attempted to assess the institutional factors that have effect on the implementation of IT. The findings indicated that in government middle level TVET institutes of Addis Ababa,

1. trainers have well teaching experience and also their major fields of study are directly related with the IT courses,
2. there is proper orientation time for introduction of apprenticeship.

These have positive impact on facilitating the implementation of information technology in the institutes.

On the other hand,

1. most of the trainers were diploma holders, and not competent on some courses of the training. They were not using the time of training effectively and also their participation in the apprenticeship was low.
2. There was less number of reference materials, technological journals and less internet access in the institutes. The institutes' facilities and educational materials were inadequate.
3. There were also lack of support and poor managing system of principals.

4. because of poor managing system, most of the training in the apprenticeship was not directly related with the field of specialization of the trainees and no proper evaluation of the apprentice.

Therefore, in the government middle level TVET institutes in Addis Ababa, the institutional factors, like the competency of trainers, efficiency of management, inadequacy of educational materials and facilities, and poor mechanisms in facilitating apprenticeship were affecting the implementation of information technology training.

5.3. Recommendations

The study indicated and suggested what to be done and by whom to be applied to minimize the factors affecting the implementation of information technology at the institutional level. As the outcomes of the study revealed that the institutional factors; competency of trainers, efficiency of principals, lack of educational material and facilities, and weak coordination in facilitating apprenticeship, affected the implementation of information technology. Hence, on the bases of the findings obtained and conclusions drawn at, the following suggestions are forwarded to minimize the institutional factors affecting the implementation of information technology at middle level institutes in Addis Ababa.

1. Information technology is dynamic by its nature. To cope up the changes, the concerned bodies need to facilitate in-service training or workshop in the areas in which the trainers need training. This skill development training program should include the participation of the trainers themselves. Need assessment should be taken on the areas that need training before applying the program. This can be done in two levels:

1.1 At the institutional level

The institutions can facilitate in-built supervision in which the information technology department members can share their knowledge in supervising their teaching sessions.

The institute's management can facilitate conditions for inviting guests who have potential to provide training on some topics that are needed by the trainers. These persons can be invited from other departments of the same institute or from other institutes or colleges out side of the institute.

In general, the institutes need to facilitate such type of training by having good relationship with other educational institutes and organizations that can fill the gap by providing training.

1.2 Out side of the institutes

Addis Ababa City Administration Regional Education Bureau and the educational office at sub-city level need to increase their coordination in facilitating such in-service training. The TVET supervisors should observe and report the need of each department in the institute. These bodies also need to have good relationship with different organizations to facilitate and invite guests to provide a workshop for information technology trainers.

- 2.** Effective principals are one of the role players in the implementation of training in general, information technology in particular. These persons should have either the necessary qualification or field of specialization or need to take in-service training to equip the skill of managing TVET institutes. Hence, the City Administration Education Bureau and the educational office of the sub-cities need to facilitate in-service training for principals who didn't take training so far. Additionally, it is also advisable, if possible, to assign the right person on the right position.

On the other hand, the principals in middle level TVET institutes need to give great attention on the nature and specific needs of each department including information technology. They should be ready themselves to accept comments on their activities that will be given

by members of the institutes including trainees. Thus, they need to have time to visit each department and take suggestions in the way the training is going on properly.

- 3.** Educational materials and facilities have their own great role in facilitating the implementation of training in general, information technology in particular. To use these materials and facilities for proper implementation of the training, the concerned persons of the institutes need to know the nature of each department. Thus,

3.1 the institutes' and the sub-city educational office need to assign computer lab technician for each institute. This help to control the computers not to fail frequently.

3.2. it is advisable that the information technology department of each institutes need to be the member of technology journals so that the teaching learning be up-to-dated. Additionally, with scheduling a program the trainees need to have Internet access.

3.3. when the institutes need to buy reference materials for the department, they need to include the concerned trainers. These help to get relevant materials that have direct relation with the course of training.

3.4 the institutes need to provide office for information technology department. This helps the trainers to prepare and practice their lesson, to store their materials and to keep their privacy. Additionally, the institutes should ensure to have at least one computer maintenance shop equipped with the necessary tools and instruments. The computer laboratories need to be clean and equipped with the necessary materials. For these, even the institutes can prepare offices and maintenance room from container body to minimize the expense.

In general to facilitate educational materials and facilities the institutes need to share experiences in distributing budgets to each department based on their specific nature and needs. They need also to look outside to get donations from interested groups and organizations based on their plan.

4. Apprenticeship exposes trainees to the world of work. Therefore, to meet the objectives of the training, each institute has its own responsibilities in facilitating apprenticeship. Thus,

- 4.1. they need to form a committee not only in their institutes but also with apprenticeship providers, so that the trainees can get more chance to be assigned in the position that is directly relating to the training. Even if there is less number of training places on specific fields, they can use shifting system.

- 4.2. the trainers of each department, including information technology, should be assigned to supervise the apprentice from their department. This has its own impact on the proper implementation and evaluation of apprenticeship program. The institutes also need to facilitate conditions that give chance to apprentice to report and present their activities to their department members in a certain intervals, so that the apprentices can share experiences to each other.

5. As this study is very limited to come up with all problems being featured in the current implementation of information technology, further and more in-depth study should be carried out on the same area to identify or provide possible answers to other problems uncovered in the study.

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Appendices

Appendix A
ADDIS ABABA UNIVERSITY
SCHOOL OF GRADUATE STUDIES
COLLEGE OF EDUCATION

DEPARTMENT OF BUSINESS EDUCATION

A questionnaire to be filled in by **trainees** of middle level technical and vocational education and training institutes.

Purpose: The purpose of this questionnaire is to collect the basic data for a research entitled “Assessment of Institutional Factors Affecting the Implementation of Information Technology in Government Middle Level TVET Institutes in Addis Ababa”. Your cooperation in Providing relevant and candid information is highly important for the success of the study. Please be frank and respond to each item as accurate as possible.

Instruction:

- No need of writing your name
- Where alternative answers are given put “√” mark in the box to indicate your answer. Please make it short and clear in responding to the open-ended question

Thank you in advance for your cooperation.

Part I Background information

1. Name of the institution _____
2. Sex Male Female
3. Age 20 or below 21-25 26-30
31 or above
4. Field of training _____
5. Training Program 10+1 10+2

Part II General Questions

- 6 Have you ever used computer before joining this institute?
A) Yes B) No
7. Do you have computer at home?
A) Yes B) No
8. Do you have interest in information technology training?
A) Yes B) No
- 9 Is the time of the training enough to practice IT courses in computer lab?
A) Yes B) No
10. If your answer for Q.9 is "No", indicate your reason by rating the following scales.

1=Strongly disagree 2=Disagree 3=Undecided
4=Agree 5=Strongly agree

	reasons	1	2	3	4	5
1	There are less number of computer lab rooms in the institute					
2	There are less number of working computers than. students in each comp. lab					
3	Trainers were not using the time effectively as expected					

If others specify- _____

11. Indicate your level of competence on doing the following activities using rating scale given below.

1=Very poor 2=poor 3=fair
4=Good 5=Very good

	Activities	1	2	3	4	5
1	Basic computer operating skill					
	-Setting computers date and time					
	Creating a new folder					
	Renaming files/folders					
	Coping a file/folder					
	Searching for a file					
	Printing a file or document					
2	Working on word processing					
	Formatting text					
	Creating bulleted or numbered list					
	Inserting header and footer					
	Inserting page numbers					
	Inserting a table					
	Creating a mail merge					
	Inserting graphics					
3	Working on Spreadsheet/Excel					
	Entering data					
	Using functions					
	Creating charts					
	Formatting cells					
4	Presentation on power point					
	Creating new presentation					
	Using slid master					
	Inserting text and graphics					
5	Working on Data base/MS Access					
	Creating a table					
	Designing and running queries					
	Designing form					
	Creating a report					
6	Using Internet					
	Sending e-mail					
	Reading e-mail					
	Sending and attaching with e-mail					
	Organizing mail folders					

12. In your opinion how do you rate the extent of your IT teachers competence of your institute? Indicate with the following scale.

1=Very low 2=low 3=moderate
4=high 5=very high

	Activities	1	2	3	4	5
1	Their teaching experience					
2	Their effort to cover the contents of the course					
3	Providing exercise on each task and duties					
4	To follow up each of the activities of the students					
5	Frequently evaluating the activities of students					
6	Knowledge of the subject matter					

13. Indicate the extent of the availability of the following educational materials that help to provide information technology courses in your institute.

	Item	Inadequate	Barely adequate	adequate	Very adequate	Excellent
1	Reference materials (books)					
2	Educational software					
3	Technology Journals					
4	Internet access					

14. Indicate the extent of the availability of the following educational facilities that help to Provide information technology courses in your institute.

	Item	Inadequate	Barely adequate	adequate	Very adequate	Excellent
1	Institution building					
2	Computer Laboratories					
3	Library					
4	Office for department					
5	Chairs in rooms					

15. The following are list of possible factors that affect the extent of implementation of Information technology . Indicate the extent of their role in hindering teaching and learning process of IT courses using the following rating scale.

5=Very severely 4=Severely 3=Moderately 2=Slightly 1=Not at all

No	Factors	5	4	3	2	1
1	Inadequacy of periods to cover contents of the course					
2	Inadequacy of time to practice in computer lab					
3	Inadequacy of technical support by teachers					
4	Lack of competency skill of teachers to teach the courses					
5	Large number of students in a class					
6	Poor supply of facilities such as computers,. Rooms, etc					
7	Shortage of software's and reference books					
8	Problems with internet access					
9	Lack of support from directors facilitating the training					
10	Lack of competency of directors to manage the training					

16. Is there orientation time to the trainees that explain how to be involved in apprenticeship?

A. Yes B. No

17. If your answer for question number 16 is "Yes, rank the extent of attention given during the orientation time using from highest rank great attention with number1 to the lowest rank for less attention with number 5..

No	Points of discussion	Rank				
		1	2	3	4	5
1	About the courses given in the institute					
2	About trainees personal problems					
3	About school compounds and rooms					
4	About apprenticeship					
5	About school discipline					

18. Using the following scale indicate the extent of participation of the following Participants in facilitating apprenticeship in your institute

Participant	Very high	High	Medium	low	Not at all
Trainees					
Vocational counselors					
Trainers					
principals					

19. What are the major problems that you observe in your institute in the implementation of information technology?

a. Major problems of training activities

b Major managerial problems.

c. Major problems on teaching materials.

d. Major problems in facilitating apprenticeship?

Appendix B
ADDIS ABABA UNIVERSITY
SCHOOL OF GRADUATE STUDIES
COLLEGE OF EDUCATION

DEPARTMENT OF BUSINESS EDUCATION

A questionnaire to be filled in by the **trainers** of middle level technical and vocational education and training institutes.

Purpose: The purpose of this questionnaire is to collect the basic data for a research entitled “Assessment of Institutional Factors Affecting the Implementation of Information Technology in Government Middle Level TVET Institutes in Addis Ababa”. Your cooperation in Providing relevant and candid information is highly important for the success of the study. Please be frank and respond to each item as accurate as possible.

Instruction:

- No need of writing your name
- Where alternative answers are given put “√” mark in the box to indicate your answer. Please make it short and clear in responding to the open-ended question

Thank you in advance for your cooperation.

12. If your answer for Q.11 is “No”, indicate your reason by rating the following scales.

1=Strongly disagree 2=Disagree 3=Undecided
4=Agree 5=Strongly agree

	reasons	1	2	3	4	5
1	There are less number of computer lab rooms in the institute					
2	There are less number of working computers for. students in each lab					
3	Trainers were not using the time effectively as expected					

If others specify _____

13. Indicate your level of competence on doing the following activities using rating scale given below.

1=Very poor 2=poor 3=fair
4=Good 5=Very good

	Activities	1	2	3	4	5
1	Working on office automation e.g. working effectively on word processing, managing worksheet, developing good database and presentation, Working on desktop publishing etc					
2	Networking E.g. Installing networking software, properly networking computers Browsing , attaching files, playing chats, posting messages for groups, sending and receiving messages with e-mail on Internet. etc					
3	Web page development Setting up a web site, creating a web page from scratch, Inserting links, tables and graphics, uploading pages to web server etc					
4	Programming Working good programs for different purposes using different programming languages, e.g. like C++, visual basic, Java, etc					
5	PC maintenance E.g.. Cleaning every part of PC, fixing different hardware and software problems of PC, up grading a PC to the new technology with the required materials, etc					
6	Working on multimedia e.g. creating different educational multimedia presentations,					

14. Is your institute facilitate in-service training for your skill development of teaching IT courses?

A. Yes B. No

15. If your answer for Q.14 is "Yes", how many times did you participate in a year?

A. once

B. twice

C. More than Three time

If others specify _____

16. Is the institute allocates a budget to each department for their educational materials?

A. Yes

B. No

17. If your response for question number 16 is "Yes", is the allocated department budget enough to purchase the educational materials of the year?

A Yes

B. No

18. Indicate the extent the availability of the following educational materials that help to provide information technology courses in your institute.

	Item	Inadequate	Barely adequate	adequate	Very adequate	Excellent
1	Reference materials (books)					
2	Educational Software					
3	Technology Journals					
4	Internet access					

19. Indicate the extent the availability of the following educational facilities that help to Provide information technology courses in your institute.

	Item	Inadequate	Barely adequate	adequate	Very adequate	Excellent
1	Institution building					
2	Computer Laboratories					
3	Library					
4	Office for department					
5	Chairs in rooms					

20. The following are list of possible factors that affect the extent of implementation of Information technology. Indicate the extent of their role in hindering teaching and learning process of IT courses using the following rating scale.

5=Very severely 4=Severely 3=Moderately 2=Slightly 1=Not at all

No	Factors	5	4	3	2	1
1	Inadequacy of periods to cover contents of the course					
2	Inadequacy of time to practice in computer lab					
3	Inadequacy of time to prepare lessons with technologies					
4	Inadequacy of financial support to IT					
5	Large number of students in a class					
6	Poor supply of facilities such as computers,. Rooms, etc					
7	Shortage of software's and reference books					
8	Problems with internet access					
9	Lack of support from directors facilitating the training					
10	Lack of competence of directors to manage the training					
11	Inadequacy of methodological training of IT					
12	Lack of support from supervisors to implement IT					
13	Absence or inadequacy of in-service training					

21. Is there orientation time to the trainees that explain how to be involved in apprenticeship?

A. Yes B. No

22. If your answer for question number 21 is "Yes", rank the extent of attention given during the orientation time using from highest rank with number1 to the lowest rank with number 5..

No	Points of discussion	Rank				
		1	2	3	4	5
1	About the courses given in the institute					
2	About trainees personal problems					
3	About school compounds and rooms					
4	About apprenticeship					
5	About school discipline					

23. Using the following scale indicate the extent of participation of the following participants in facilitating apprenticeship in your institute

	Participant	Very high	High	Medium	low	Not at all
1	Trainees					
2	Vocational counselors					
3	Trainers					
4	principals					

24. Use the following rating scale to indicate your opinion in evaluating the level of apprenticeship of trainees.

1=Strongly disagree 2=Disagree 3=Undecided
4=Agree 5=Strongly agree

	Activities	1	2	3	4	5
1	The apprenticeship is directly related with the training given in the institute					
2	Apprenticeship providers evaluate properly the apprentice's activity					
3	Teachers have chance to follow and give comment on the activities of their trainees in the apprenticeship program					

25. What are the major problems that you observe in your institute in the implementation of information technology?

a. Major problems of training activities

b Major managerial problems.

c. Major problems on teaching materials.

d. Major problems in facilitating apprenticeship?

11. If your answer for Q.9 is "Yes", how many times did the trainers participate in a year?
- A. once B. twice C. More than Three times

If others, please specify _____

12. If your answer for Q.9 is "No", what are the reasons not to provide the training?
-

13. How do you explain the activities of the IT teachers in doing the following activities?

- a. Planning their lesson
- b. effort to cover the contents of the courses
- c. Frequently evaluating the activities of trainers

14. Is the institute always fully utilize annually allocated budget?

A. Yes B. No

15. Is the institute allocate budgets for each department for their educational materials?

A. Yes B. No

16. If your response for question number 12 is "Yes", is the allocated department budget enough to purchase the educational materials of the year?

A. Yes B. No

17. Do you think that the necessary educational materials were provided sufficiently to IT training?

A. Yes B. No

18. Do you think the institute facilities are convenient to IT training?

A. Yes B. No

19. Is there orientation time to the trainees how to be involved in apprenticeship?

A. Yes B. No

20. If your answer for question number 17 is “Yes”, which of the following points took more attention in the orientation time?

- a. About the courses given in the institute
- b. About trainees personal problems
- c. About school compounds and rooms
- d. About apprenticeship
- e. About school discipline

If others specify _____

21. Using the following scale indicate the extent of participation of the following in facilitating apprenticeship in your institute

	Participant	Very high	High	Medium	low	Not at all
1	Trainees					
2	Vocational counselors					
3	Teachers					
4	principals					

22. From your experience:

	Activities	Yes	No
1	Is apprenticeship directly related with the training given in the institute?		
2	Are apprenticeship providers evaluating properly the apprentice’s activity?		
3	Do teachers have chance to follow and give comment on the activities of their trainees in the apprenticeship program?		

23 What are the major problems that you observe in your institute in the implementation of information technology?

- a. Major problems of training activities
- b Major managerial problems.
- c. Major problems on teaching materials.
- d. Major problems in facilitating apprenticeship?

9. Using the following scale indicate the extent of participation of the following in facilitating apprenticeship in your institute

	Participant	Very high	High	Medium	low	Not at all
1	Trainees					
2	Vocational counselors					
3	Teachers					
4	principals					

10. From your experience:

	Activities	Yes	No
1	Is apprenticeship directly related with the training given in the institute?		
2	Are apprenticeship providers evaluating properly the apprentice's activity?		
3	Do teachers have chance to follow and give comment on the activities of their trainees in the apprenticeship program?		

11. How do you explain the participation of the principals to the following activities?
- promoting the teaching learning activities
 - efficiently utilizing the resources of the institute
 - the extent of willingness to participate in decision making?
12. What are the major problems that you observe in your institute in the implementation of information technology?
- Major problems of academic activities
 - Major managerial problems.
 - Major problems on teaching materials.
 - Major problems in facilitating apprenticeship?

Appendix E

ADDIS ABABA UNIVERSITY SCHOOL OF GRADUATE STUDIES FACULTY OF EDUCATION

DEPARTMENT OF BUSINESS EDUCATION

Interview guide for middle level TVET supervisors

Part I Background information

1. Name of the Organization _____
2. Sex Male Female
3. Educational qualification
Certificate Diploma BA/BSC MA/MSc
4. Position _____
5. Total number of service years in the position _____

PART II General Questions

- 6 Are the IT teachers taking short term training for improvement of their skill ?
A. Yes B. No
7. If your answer for Q.6 is "Yes", how many times did the teachers participate in a year?
A. once B. twice C. More than Three times
If others specify _____
8. If your answer for Q.6 is "No", what are the reasons not to provide the training?

9. From your supervision of the institute activities, how do you rate the extent of the IT teachers in doing the following activities?
- planning their lesson
 - effort to cover the content of the courses
 - frequently evaluating the activities of trainees

10 What did you observe about the possibility of trainees to access Internet in the institute?

11. How do you explain the participation of the principals to the following activities?
- promoting the teaching learning activities
 - efficiently utilizing the resources of the institute
 - the extent of willingness to participate in decision making?

12. Using the following scale indicate the extent of participation of the following in facilitating apprenticeship in your institute

	Participant	Very high	High	Medium	low	Not at all
1	Trainees					
2	Vocational counselors					
3	Teachers					
4	principals					

13. From your experience:

	Activities	Yes	No
1	Is apprenticeship directly related with the training given in the institute?		
2	Are apprenticeship providers evaluating properly the apprentice's activity?		
3	Do teachers have chance to follow and give comment on the activities of their trainees in the apprenticeship program?		

14. What are the major problems that you observe in your institute in the implementation of information technology?
- Major problems of academic activities
 - Major managerial problems.
 - Major problems on teaching materials.
 - Major problems in facilitating apprenticeship?

Appendix F
ADDIS ABABA UNIVERSITY
SCHOOL OF GRADUATE STUDIES
FACULTY OF EDUCATION

DEPARTMENT OF BUSINESS EDUCATION

Observation check-list to Supervise Government Middle Level TVET Institutes.

The Purpose of this check list is to collect relevant data pertaining to the condition of information technology training facilities of Government Middle Level TVET Institutes.

1. Name of the Institute _____

2. Establishment _____

	Availability and Conditions of training facilities	Yes	No
1	Class room conditions		
	Class room size		
	Black board		
	Desk/seats		
2	Computer rooms		
	White board		
	Arrangement of position of computers		
	Installation in computer rooms		
	Availability of UPS to computer rooms		
	Printers		
	Scanner		
	Networking-kit		
	Ventilations		
3	Libraries		
	Availability of reference materials		
	Availability of software		
	Rooms size and chairs		
4	Internet rooms		
5	Department office		
6	Buildings of the institutes		
	Access to power		
	Attractiveness of the institutes(colors, trees, flowers, etc		
	Position of future expansion		

F

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Declaration

This thesis is my original work and all the sources of information used in the study have been fully acknowledged.

Name Assefa Ditta Debele

Signature _____

Date _____

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

Name Lemma Setegn

Signature _____

Date _____