Practices and Challenges of Mathematics Teachers in Conducting Action Research in Secondary Schools of Addis Ababa

Presented in Partial Fulfillment of the Requirements for the Degree of Masters in Mathematics Education

By

Chehos Kebede

A Thesis Submitted to College of Education and Behavioral Studies, Department of Science and Mathematics Education

Addis Ababa University

Addis Ababa, Ethiopia

July, 2015

Practices and Challenges of Mathematics Teachers in Conducting Action Research in Secondary Schools of Addis Ababa

By

Chehos Kebede

Addis Ababa University, College of Education and Behavioral Studies

Addis Ababa, Ethiopia

July, 2015

Addis Ababa University, College of Education and Behavioral Studies, Department of Science and Mathematics Education

Practices and Challenges of Mathematics Teachers in Conducting Action Research in Secondary Schools of Addis Ababa

By

Chehos Kebede

Approval of the Board of Examiners

Chairman, Department _____ Signature_____ Date_____

Committee _____ Signature_____ Date_____

Advisor _____ Signature_____ Date_____

External Examiner _____ Signature_____ Date_____

Internal Examiner _____ Signature_____ Date_____

Acknowledgments

First and for most, I would like to express my sincere and profound gratitude to my advisor, Dr. Solomon Areaya, for his constructive comments and unreserved guidance on crucial issues of the study. I am also indebted to all of my respondents from sub-city level supervisors up to school levels for their provision of the reliable and up-to-date information for this study. Beside, I owe a deep sense of gratitude and appreciation to my wife w/ro Fasika Tedla who has overcome all the responsibilities and burdens of our family and for her continues encouragement and support throughout the study.

Finally, much of my whole hearted gratitude goes to my mother Tsehay Asefa, My brothers Esaw Alemayehu, Henok Kebede, Solomon Degefu, Tadle Tedla and Seifu Gossay for their endless financial and moral support until the completion of the study. I am also indebted to all my friends who have given me moral and materials support during my study.

Table of Contents

Contents Pages

List of Tables

List of Abbreviations and Acronyms

AED	Academy for Educational Development
AR	Action Research
BA	Bachelor of Arts
BED	Bachelor of Education
CPD	Continuous Professional Development
ETP	Education and Training Policy
MA	Masters of Arts
MED	Masters of Education
MSc	Masters of Science
MoE	Ministry of Education
N	Number
PR	Principal
SSMT	Secondary School Mathematics Teachers
SCLEO	Sub City Level Education Office
SSP	Secondary School Principal
TESO	Teacher Education System Overhaul
TGE	Transitional Government of Ethiopia

Abstract

Practices and Challenges of Mathematics Teachers in Conducting Action Research in Secondary Schools of Addis Ababa

Chehos Kebede

Addis Ababa University, July 2015

The main purpose of this study was to assess the practices and challenges of mathematics teachers in conducing Action research in Governmental Secondary Schools of Addis Ababa city Administration. A descriptive survey research design was employed to conduct the study. Data were gathered from 10 sub-city level supervisors, 10 Governmental secondary school principal and 139 governmental secondary school mathematics teachers. In order to select sample respondents, simple random sampling and availability Sampling techniques were employed. Data for the study were collected using questionnaire, interview, focus group discussion and observation. Data obtained from questionnaire, were analyzed using statistical tools like frequency and percentages. The data from interview and focus group discussion was analyzed qualitatively and observation was analyzed with the data collected through questionnaire, interview and focus group discussion where necessary. The finding from data analysis revealed that the support given to governmental secondary school mathematics teachers practice training in action research was low, the supports provided to secondary school mathematics teachers even after they started practicing action research was found very law. The follow up system was also very poor. Furthermore Governmental Secondary School mathematics teachers Action research was varied from school to school and the major challenges of secondary school mathematics teachers in conducting action research were getting support on the scientific methods of conducting action research and continuous follow up from experienced sub-city level supervisors or experts on the basis of these findings, it is recommended that continuous training and support to school teachers is necessary to tackle the challenges of secondary school mathematics teachers.

CHAPTER ONE

1. Introduction

1.1. Background of the study

Studies like (Segal, 2009; Feldman & Minstrell, 2000) stressed the importance of action research for a teacher in the classroom. Action research can provide the teacher a testing environment to try his or her professional practice and examine the outputs to improve the classroom teaching-learning process.

Various types of research approaches could be used to study the different kinds of educational problems. Recently, however, one particular research approach that has been found to be quite amenable and appropriate to bring improvement in the practice of the teaching learning process known as action research (Jaworski, 2006).

Action research can be defined as an applied form of educational research commonly done by practitioners (the teacher) at the classroom and school level in order to improve practices (Segal, 2009). Justifications for the need to conduct action research by school teachers have been given by many foreign and local scholars (Segal, 2009; Feldman & Minstrell, 2000; Jaworski, 1998). According to these scholars, action research can be conducted to attain three main objectives or goals. These goals are improving the teaching-learning practice, improving the practitioner; that is, the teacher itself and improving the practice setting which is the school in this case.

In the Ethiopian context, all of the three goals of action research are reflected in the education and training policy (ETP) and its directives. That is the ETP of the country has accentuated the importance of research and related competencies, such as the problem solving and creative thinking. In line with this, the policy document states that researches of practical impact to the society will be given priority and the necessary steps will also be take to facilitate the coordinated efforts of all those concerned (TGE,1994:27.)

Besides, the Ministry of Education (MOE) has developed Teachers Education system over haul (TESO) program in 2002 as a new scheme as a scheme in the preparation and development of teachers and as an encouragement to improve the practice of research in the schools. The TESO

Policy document (2003) states that school teachers should participate in research programs to alleviate educational problems with in the classrooms or in the school.

Furthermore, a directive is issued by the MOE (April 1,1996) requiring teachers to stay all day in school during week days so as to enable teachers to take the initiative of engaging themselves in research activities. All these show that research has got a pivotal place in our education /school/ system. Therefore, in the light of such new developments that encourage the culture of research in the school system, it seems a sound justification to examine the practice of action research by mathematics teachers in secondary schools.

1.2. Statement of the Problem

The principal purpose of this study was to investigate the extent of practices and challenges of mathematics teachers in conducting action research in schools of Addis Ababa city Administration and to identify factors that affected mathematics teacher from conducting action research and finally to come up with suggestions for action.

As briefed above, action research can serve different purposes inside a school. Through the proper implementation of action research, mathematics teachers can be able to improve the quality of their practice and profession. It can also help teachers acquire more knowledge and skills in the teaching-learning process. Teachers can make independent judgment to improve their techniques and methods of instruction. They can raise the understanding of their classroom environment rapidly. At secondary schools, it is highly expected from mathematics teachers to carry out action research to solve actual classroom problems. However, a random initial survey conducted by the researcher indicated that there no adequate evidence that indicates the extent to which secondary and preparatory mathematics teachers conduct action research to solve real educational problems in the classrooms or in the schools. Nor there are any systematic attempts made to study the conditions under which secondary school mathematics teachers do action research to the above end.

Since schools can benefit greatly from the use of action research, school administrators are expected to provide sufficient support and training to teachers. Nevertheless, evidence is required as to the extent to which such support has been given to secondary mathematics teachers and the

types of support made available to them. The reaction of teachers to the support given by the schools is also needed to be understood so that others may learn from their useful experiences.

Students get poor achievement and anxiety in mathematics, hence there is a need to address these by mathematics teachers in conducting Action research, but conducting action research requires adequate knowledge and skills that are to be acquired through training and practice. It is not yet researched to what extent secondary schools mathematics teachers feel about involving in conducting action research in actual classrooms to improve school situations. Thus the study would like to develop the knowledge and skills of secondary and preparatory school Mathematics teachers' involvement in conducting action research for improving the teaching learning process of mathematics subject. In line with this understanding, it has become significant and necessary to explore practice and challenges of mathematics teachers in conducting action research in schools.

The main reason which triggered the undertaking of this study is problems related to education are many in number and it is very common to hear about the deterioration of quality education. These information are hearsays; which are not backed up with adequate research data. In order to alleviate the problem of hearsay, research based information is required more than ever before.

The culture of doing action research for the subject mathematics in the school enhance and enrich the teaching learning process by contributing to the improvement of the quality of mathematics education (Segal,2009). However, it may not be true that action research activities in Addis Ababa secondary schools are commonly undertaken by mathematics teachers in tackling the problems that obscure and jeopardized the quality of mathematics education. Since school teachers are the professionals and key role players of the system, they are the ones who should be concerned with the problems highlighted above. As a result, the degree and scope of educational problems are getting worse from time to time and the quality of education is deteriorating.

The other rational problem that led the undertaking of this study is; in the current Ethiopian education and training policy, the importance of educational research is given strong emphasis. According to this policy, teachers at high school level are required to conduct educational research. But a promising step is not observed in facilitating conditions to conduct action

research regarding mathematics by the concerned bodies. Rather educators are trying to solve every problem by trial and error and this trial and error method cannot provide reliable information for action and serve as a scientific method of tacking the problem properly. Evidences supported by action research are highly needed. This study will thus investigate school teachers who are involved in action research and identify the major problems that hindered the school teachers from using action research in the school.

1.3. Objective of the Study

The general objective of the study is investigating the practices and challenges of mathematics teachers in conducting action research in secondary schools of Addis Ababa. Specifically, the study seeks to:

1) Find out the awareness and capability of mathematics teachers in conducting action research
2) Explore the extent to which secondary and preparatory mathematics teachers of Addis Ababa are conducting action research.
3) Identify the major factors that affect secondary school mathematics teachers from conducting action research?
4) Provide mechanism in conducting action research and give suggestion for further developing the culture of doing action research by mathematics teachers in the school in the future.

1.4. Research Questions

To address the above problems, the study raised the following four basic questions.

1) Do mathematics teachers in secondary schools of Addis Ababa have the necessary awareness and capability of conducting action research?
2) Do mathematics teachers in secondary schools of Addis Ababa Conduct Action research?
3) What are the factors influencing mathematics teachers from conducting action research?
4) What mechanisms should be devised in order to involve mathematics teachers and further develop their culture of doing action research?

1.5. Scope of the study

The need for conducting action research is important and may require wider coverage at the various levels of the education system. However, the scope of the study was delimited to governmental secondary school (9-12) of Addis Ababa city administration. Moreover it was to asses the types of assistance which mathematics teachers receive to conduct action research and the challenges mathematics teachers face in conducting action research in secondary school of Addis Ababa city Administration.

Furthermore this study was delimited to investigate the status of secondary school mathematics teachers' involvement in conducting action research and assess the effect of the factors on mathematics teachers' in conducting action research. In addition to this, since it was very difficult in terms of finance and time constraints to conduct this study on a wider scope, the study was delimited to Addis Ababa region only. Addis Ababa city is deliberately chosen for the study because of the fact that the researcher is working in the city which would facilitate the gathering of data on the problem.

1.6. Limitations of the Study

Most city administration are preoccupied with their daily chores, it is difficult to get the required response timely and some school teachers were also not willing to participate in the study hence, to make the data obtained from the study more reliable, schools with voluntary teachers are selected for the study.

CHAPTER TWO

2. Review of Related Literature

One of the major continuous professional development (CPD) activities for a teacher is action research. It is an important practice in developing the educational profession within an educational system. Action research is the study of social situation involving participants as researchers with the aim of improving the quality of action within it. From this it is possible to recognize that teachers can improve their practices in classroom by doing action research. Action research is not a "library work" where teachers learn more about a topic that interest them but rather it is considered as a tool used by teachers to understand and improve their practice. Action research in education is a small-scale practice of the practitioners (the teachers) which focuses only on a particular problem and gets immediate solution. Educational action researches are about the self interaction of teachers or schools in their ongoing practices.

To understand the importance of action research further, we need to first address questions like "what is action research?", "how is action research useful to the development of the teaching profession and educational system?"

Action research is a form of collective self reflective enquiry undertaken by participants in order to improve the rationality and justice of their own social or educational practices as well as their understanding of the practices and the situations in which the practices are carried out.

ICDR (1998) as cited in MOE (2003) viewed action research as "a small-scale intervention in the classroom to the function of the real world and to the close examination of the effects of such intervention." This entails that it is the process by which the researcher involves in the function of real world.

What makes action research different from pure research is that the former is directed to increase the quality of practical application. It follows phases of problem identification, systematic data collection, reflection, analysis, data driven action and problem redefinition. It is then improving action through systematic studies (Gay and Airasian, 2000).

According to (Mclaughlin, 1996), there are three basic reasons why action research is good for teachers' professional development; (1) it is inquiry based and allows teachers to investigate their own words; (2) it is aimed at the improvement of teaching and learning in schools; and (3) it leads to deliberate and planed action to improve conditions for teaching and learning.

Research is then useful to generate knowledge, to disseminate it, to improve practice and to win public esteem to teachers and their profession. That is why school principals and concerned educational authorities have to undertake exemplary action research, allocate fund, furnish libraries with current education journals and related materials and involve teachers in research activities.

2.1. The purpose of Action Research

The efforts of an educational investigator who is engaged in action research have different primary purposes. As to schmuck (1997), action research is to study a real school situation with a view to improve the quality of actions results within it. It aims also to improve one's own professional judgment and to give insight into how better to achieve desirable educational goals.

Elliot (1988) enumerates the following purposes of action in school action research in schools investigates human actions and social situations which are experienced by teachers; the aim of action research is to deepen teacher's understanding of her/his problem; action research espouses a theoretical stance in which action intended to change the situation is temporarily suspended until a deeper understanding of the practical problem has been achieved; in explaining what is going on, action research tells a story about the event; action research interprets what is going on by relating it to a context of mutually interdependent contingency.

Furthermore, Kemmis (2001) stated that action research aimed at critical reconstruction of the work (practice), the worker (the practitioner) and the workplace (the practice setting). Action research as stated by Stuart (1991), tries to keep problem solving in close touch with reality at every stage. It is concerned with the immediate problem here and now in the local setting. Action research offers a means for changing from current practices towards better practice.

All the descriptions cited above imply that action research has been used often in the field of education for the purpose of improving practices (teaching-learning process) as well as

improving the practitioners (teachers) and the practice setting (schools). The action research is interested in the improvement of educational practice in which he/she is engaged. He/she undertakes research in order to find out how to do his/her job better.

2.2. Models of Action Research

There are two models of action research, as identified by Schmuck (1997). They are proactive and responsive. These two models differ primarily at when the data are collected and analyzed during the cycle of events. In proactive action research, action precedes data collection and analysis. The educator acts and then studies effects of the actions. Whereas, in responsive action research, data are collected and analyzed before action is taken. The educator diagnoses the situation, or does a need assessment, before acting. In both cases, action and research are alternating parts of the same overall project.

2.3. Approaches in Action Research

There are different ways or approaches of action research that can be conducted under different circumstances. Elliot (1991) has noted that action research follows three approaches; the collaborative, the individual, and the whole school staff approaches. In the collaborative approach, a voluntary group of teachers or school administrators, students and parents may constitute as part of the research team. In the individual approach, action research is carried out personally by an individual teacher.

In the third approach, the entire school may get involved in the selection of the educational problem to be studied.

2.4. Steps or Procedures of Action Research

As I have tried to see indifferent books (Cohen and Mannion, 1994; schmuck, 1997; Elliot, 1991) action research doesn't have a fixed procedure of steps. But in most of the books, the process of action research is stated in the following pattern in one way or the other reflection (i.e reviewing one's own practice), identification of a problem (i.e diagnosing a problem); action planning (i.e the Consideration of alternative courses of action to solve the problem identified); action taking (i.e implementing the plan according to the schedule); Observing (i.e using different methods,

collect data to see the effect of the action taken, or the careful recording of the action and accumulation of evidence to determine if the desired goal has been achieved or not); reflecting (i.e re-assess the problem /studying of the outcomes or the findings); and trying new practice (i.e implementing the next action step).

From the above descriptions of steps or procedures of action research, one can possibly say that action research broadly encompasses research, action, participation or intervention, and reflection and, specifically the procedure of the action research process can be explained as a "self-reflective spinal' of reflecting, planning, acting, observing, and re-planning in one way or another.

2.5. Historical Development of Action Research

Action research emerged as a distinct line of inquiry notably after the end of the second world war (Elliot, 1988; Kemmis, 1983; Schmuck, 1997). Practitioners have presented action research as an alternative to overcome the limitations posed by positivism often giving the impression that action research and positivism are contradictory research movements.

The term action research was the brain-child of Kurt Lewin (1890), a social psychologist; that is, Lewin was the first scholar to use the term "action research", in the 1940's, to refer to a specific research approach in which the researcher generates new social knowledge about a social system, while at the same time attempts to change it (Schmuck, 1997; Kemmis, 1983). Action research, according to Lewin cited in Kemmis (1983), consists of the activities as analysis, fact-finding, conceptualization, planning execution, more fact-finding or evaluation and then a preparation of this whole circle of activities.

After Lewin, Alice Miel and Stephen Corey were two pioneers in linking action research to school improvement (in the 1950's), both worked at the Horace-Mann-Lincoln Institute of school. Experimentation at Columbia University in New York (Schmuck 1997). Ether way, on applying action research to the field of education, the first systematic attempt was made by Stephen corey and Alice Miel. This fact indicates that the idea of action research was absorbed into education almost as soon as it was originated.

The evolution of an action research agenda with in education has also been influenced by people, such as stenhouse (1975); Kemmis (1983,1990); Hopkins (1985): Elliot (1991).

The idea of action research was swallowed by other traditional research thoughts until 1980s nevertheless, as of the 1980s there has been a revival of interest in action research that reflects contemporary trends and issues (AED/MoE, 2006).

As reviewed by Zeichner (2001) there are five major traditions of educational action research that have exerted influence on the development of action research in the educational system of many countries.

First, there is the action research tradition in the USA that developed directly out of the work of Kurt Lewin and was brought in to schools by Stephen Corey and others at the Horace-Mann-Lincoln. Institute at Columbia University. Secondly there is the British teacher-as-researcher movement's that evolved in the 1960s and 1970s out of the curriculum reform work of British teachers and the support provided by several academics, such as Lawrence Stenhouse and John Elliott. Thirdly, there is the Australian participatory action research movement, supported by the work of Stephen Kemmis and Robin Mc Taggart at Deakin University and other Australian academics. Fourthly, there is contemporary teacher researcher movement in North America that has developed since the 1980s primarily by teachers.

Finally, there is the recent growth of self-study research by college and university educators. Zeichner has also remarked that educational action research has also been influenced by the traditions of participatory research which developed in Africa, Latin America and Asia with oppressed groups and latter was adapted to community –wide research in North America.

2.6. Phases of Action Research

There phases of action research are initiation, detection and judgment (Schmuck, 1997). When these phases occur in proactive and responsive action research. Accordingly, action researchers collect data at each of these three phases to understand what they are doing or to reflect or what they should be doing.

Generally speaking, each phase of action research entails research of one sort or another. Initiation calls for either a formal data collection, as in responsive action research, or a more information retrieval of fresh ideas by reading or conferring with colleagues, as in proactive action research.

Detection calls for data collection to track (find out) how new actions are working. Judgment calls for data collection to assess result and to revise the action so it will be more effective in reaching desired objectives. Thus data collection is a formal feature of virtually every aspect of action research.

2.7. Strengths of Action Research

As the strength of action research are concerned, different scholars and authorities (e.g. cohnnd Manion 1994; Schmuck, 1997; Ken Zeichner, 2001; AED/MoE, 2006) advocate it in different ways. Major but not exhaustive strengths of action research are it enhances teacher's motivation; it is a means of improving student learning; It is a means of professional development; it raises direct practical question; it is like an in-service training, it helps in professionalizing teaching, it could be a means to improve the traditional research methodology, which derivate theory first and goes to practice; it shows commitment and create positive relation with parents, students and the society as a whole, it is a means to influence educational policies; and it develops teacher's confidence.

Moreover, AED/MoE (2006) states the benefit of action saying "Action research promotes a critical attitude, and research in to teaching, accountability, self-evaluation and professionalism, which all of these are important goals anywhere in the world. Action research may provide a practical solution to problems occur. Through systematic investigation, teachers can become more professional, more interested in pedagogical and other aspects of the school and more motivated to integrate their research and teaching interests in a holistic way. This, in turn, can lead to greater job satisfaction, better academic programs, improvement of student learning and practitioner's in sights and contributions to the advancement of knowledge in education.

From the a aforementioned descriptions, it is clear that action research helps educators, primarily, to solve practical educational problems, and moreover; it can help teachers to be

collaborators in tacking educational problems. Specifically, it can help teachers to collaborates on the revision of the curriculum, improve their work environment, professionalize teaching and suggest ideas for the development and revision of educational prelacy.

2.8. Methods of Data Collection in Action Research

Action research requires a planned method for gathering data. The most popular ways to collect data are interviews, observations, focus group discussion (FGD) questionnaires, and documents (Schmuck, 1997; Degarege, 1999; Merriam, 1988).

Schmuck (1947) has also reminded that every action research project should include its own unique mix of interviews, observations, FGD, questionnaires, and documents.

2.9. Action research situation in Ethiopian School

It is clear that one of the major concerns or the focus of these educational policy in meeting the challenges of teaching-learning process and tackling the problem of quality in education is by facilitating conditions to conduct research in classroom and school situations. This entails teachers are encouraged to conduct action research. In this regard, it is expected that high school teachers can conduct research for improving the teaching-learning process, the curriculum as well as their professional competence.

From the above description, it is acknowledged that action research can help teachers to be collaborators in tackling educational problems such as quality, relevance etc. More specifically, action research can help teachers to collaborate on the revision of the curriculum, improve their work environment, professionalize teaching, and suggest ideas for the development and revision of educational policy (AED/MoE, 2006)

Unfortunately, however, the available research works in the area indicated that, the status of research activities in schools is marginal (e.g Seyoum, 1998. Firdissa, 2000; Hussen, 2000, Yalew, 2000; Yeshimebrat Mersha, 2000; Amare, 2000; Abreham, 2004) Astewr, 2004 the AED/MOE, 2006; Yibeltal, 2006).

Furthermore, the AED/MoE (2006) in its study, which aimed to explore how action research in schools is carried out in Ethiopia, found out nine major findings (PP 110-155) these are:-

1. The knowledge (training and skills) of teachers in action research are not adequate.
2. Teachers do not practice action research as much as expected.
3. Collaboration in doing action research was encouraging among teachers but more collaboration took place in urban schools than rural schools.
4. Both inside and outside school factors were motivating factors for those teachers who do action research.
5. Factors inside and outside impede doing action research by teachers.
6. Most of the teachers applied the procedure of traditional-descriptive research to do action research.
7. Support provided by school and authorities for teachers who did action research seems inadequate or insignificant in many schools
8. School do not use the results or findings of action research in the real situations.
9. Most of the students do not have an idea about research conducted in their schools.

Yibeltal (2006), in his study that tried to assess the status of action research in Ambo general secondary school has found out that the status of action research activities was marginal due to teachers' luck of motivation that resulted from interruption of promotion in the career structure, teacher's lack of interest and negative attitude; teachers' lack of commitments, inadequate facilities; lack of research knowledge and skill, lack of finical support, and others.

According to the major findings of these studies the state of educational research in the Ethiopian secondary schools has suffered from the following problems or constraints in adequacy of research skill (lack of imagination; lack of financial and material resources in the schools; lack of confidence; work overload; lack of motivation and of interest; administrative problems) absence of government policy with regard to academic freedom; failure in coordinating efforts among education authorities in research activities. From the above descriptions of the findings of the available studies on the current state of action research, one can one safely infer undertaking action research is perceived a complex process by most school teachers, and hence, there is less effort and less participation. The few teachers who participated to undertake research had applied the traditional research approach; action research in Ethiopia schools is at its early stage of development, that is most available studies disclosed a characteristics of infancy though some attempts have been made by teachers to undertake research.

CHAPTER THREE

3. Method of the Study

3.1. Research Approach and Design

The purpose of the study is to investigate the practices and challenges of mathematics teachers in conducting action research in secondary schools of Addis Ababa. Hence, the methodology of the research emerged out of the nature of the problem and the purposes of the study. Mixed method approach is used to carry out the study. In this regard I have applied both a qualitative and quantitative research method to explore the research participant's understanding and interpretation as regards what secondary school mathematics teachers involvement in action research looks like and to obtain the problems they faced while involving in conducting action research and also to get a full understanding of the magnitude and challenges of the engagement of secondary school mathematics teacher in action research. Therefore, a descriptive survey with both quantitative and qualitative data gathering is employed as a research approach

3.2. Sources of Data

The sources of data under investigation are secondary schools mathematics teachers, secondary school principals and sub-city level supervisors in Addis Ababa city administration. Data were collected from the sources described above for the reason that they can provide relevant information to understand the problem under study. In addition to this, various recorded documents with respect to conducting action research by mathematics teachers in secondary school and related activities were used as secondary sources.

3.3. Population and Sampling procedure

Secondary school mathematics teachers, secondary school principal and supervisors at sub-city level in Addis Ababa city Administration were the population of the study. This is because the researcher believed that, these members of the school community can provide relevant information to understand the problem under consideration.

There were a total of 308 secondary schools in Addis Ababa city administration and in these secondary schools there are 1031 mathematics teachers. In addition, there are also 370 school principals and 158 sub-city supervisors. Abstract of Addis Ababa Education Office (2006E.C).Since, it uses survey method; a sampling technique is used to select the sample size. That is, there are ten sub-cities in Addis Ababa and each sub-city is considered as a cluster. From each cluster, one governmental secondary school is randomly selected which makes a total of ten governmental secondary schools. Hence, as a result, 149 mathematics teachers, 10 principals and 10 sub-city level supervisors; one from each sub-city were selected to get pertinent and precise information since the supervisors have responsibilities to guide, coordinate and supervise school activities and to extend the necessary support to schools. Besides, they monitor all the teaching-learning process in general and action research activities in particular. Since, the sub-city supervisors and principals where 158 and 370 in number respectively, availability sampling was employed for the study.

As stated in the education policy directives (MoE, 2002: 32) school administrators particularly directors and deputy directors, are charged with the tasks or responsibilities of facilitating conditions for teachers so as to conduct school- based studies and research that could help improve the teaching-learning process as well as the school's organization and administration. Furthermore they are empowered to evaluate the results of the studies and are also expected to make use of the result of the studies to improve school situations. Thus totally ten governmental secondary school principals in the sampled secondary schools were included in this study as data source. The selected respondents are shown in the table.

Table 1. Name of schools and number of respondents selected from the study site in all sub cities.

No	Name of sub-city	Name of the schools	Number of Mathematics Teachers			Principals			Sub cities Supervisors		
			Sex			Sex			Sex		
			M	F	Total	M	F	Total	M	F	Total
1	Addis Ketema	Addis Ketema Preschool	18	-	18	1	-	1	1	-	1
2	Arada	Minilik	17	2	19	1	-	1	1	-	1
3	Gulele	Medhani	16	3	19	1	-	1	1		1
4	Kolfe Keranigo	Ayer Tena	12	5	17	1	-	1		1	1
5	Nifas Silik Lafto	Kefitegna 23	12	1	13	1	-	1	1	-	1
6	Lidete	Lideta Hidas	7	-	7	1	-	1	1	-	1
7	Cherkois	Shimeles Habete	15	2	17		1	1	1	-	1
8	Bole	Bole	19	-	19	1	-	1		1	1
9	Yeka	Ras Mulugeta 5	5	2	7		-	1	1	-	1
10	Akaki Kality	Bulbula	11	2	13	1	-	1	1	-	1
Total			**132**	**17**	**149**	**9**	**1**	**10**	**8**	**2**	**10**

3.4. Instrument for data Collection

The researcher employed multiple instruments to collect useful data for the study. These include questionnaires, interview, observation, document review and focus group discussion (FGDs).

3.4.1. Questionnaires

In order to secure pertinent information for this study, I developed structured questionnaire as the main instrument for collecting the needed data. Questionnaire is preferred because it the most appropriate means to involve large size sample population together the necessary information or to collect large amount of data in a relatively short period of time. I used both closed and open ended questions in order to collect relevant information based on the research question the research believed that close ended item is used for the reason that it provides a greater uniformity of responses and to make easer to processed. In addition when questions are close-ended, respondents will be able to select from a list of answers provided to them. In the case of open – ended item, the major purpose is to give opportunity to the respondents to express their feeling perception challenges problems and intentions related to action research without restriction. This enables the researcher to get detail information about the activities, problems, awareness secondary school mathematics teachers competencies including action research, future plans of mathematics teachers involving themselves in action research and further development in culture of doing action research.

3.4.1.1. Pilot testing Instruments

The data collecting instrument (the questionnaire) was tested on. One selected school before the real data of questionnaire data gathering. The participants of this pilot testing were 18 Teachers. The result of the pilot testing was that, the questionnaire was found relevant to gather the data. This activity helped the research to check how far the prepared questionnaire was relevant to collect the data.

3.4.2. Interviews

This study also employed an interview as a method of data collection in order to get additional information and to collect qualitative data from secondary school mathematics teachers, secondary school principals and sub-city level supervisors under the problem considered. This

type of data collection instruments is used to collect verbally in face to face situation so that I can understand the feeling and what is in or on the respondents mind. The instrument mainly consist of questions about secondary school mathematics teachers practices and status of action research, factors that affect Mathematics teachers' action research undertaking, the kind of support provided for those teachers, mathematics teachers' interest and initiatives to conduct action research and development of mechanism to culture of doing action research of secondary school mathematics teachers.

3.4.3. Observation

Observation can be of the setting or physical environment, social interactions, physical activities, non-verbal communication, planned and un planned activities and interaction.

The information was obtained related to what is currently happenings and is not complicated by either the past behavior or future. Thus the researcher observed action research activities of mathematics teachers without directly involving in the situation being observed to cross-check with the result of the questionnaire on the practice and challenges. related to action research activities of mathematics teachers in secondary schools. The observation conducted based on the guiding observation checklist.

3.4.4. Document Review

In document analysis, the researcher viewed documents to asses or analyze action research out comes produced by secondary school mathematics teachers and documents concerned with mathematics teachers action research activities were analyzed to cross-check the correspondence between what respondents say and what they practically do.

3.4.5 Focus Groups Discussion (FGDs)

The researcher used focus group discussions (FGD) to collect qualitative data in the school. Here the researcher served as a facilitator of discussion by forwarding discussion issues specific to action research and motivating all to participate actively and living the stage open for discussion. The focus group who were secondary school mathematics teachers were asked to come together in order to discuss a certain issue for the purpose of the research.

3.5. Procedures for data collection

The prepared questionnaires were administered to principals and mathematics teachers of secondary schools. Interview was conducted with secondary school mathematics teachers, principals and sub-city level supervisors in the area of mathematics teachers' action research activities. Finally FGDs, observation and document analysis were made to get more data and to cross-check information gathered.

3.6. Methods of data Analysis

The data obtained from questionnaires, interviews and document analysis were edited, categorized and tabulated using tables, after this; the data were interpreted and discussed. Finally, the major findings of the study were reported, conclusions were made and finally recommendations were forwarded.

CHAPTER FOUR

4. Presentation, analysis and Interpretation of Data

4.1. Characteristics of the Respondents

In this study a total of 159 copies of questionnaires were distributed. That is ten for school principals,149 mathematics teachers in ten selected secondary schools of Addis Ababa to both the principal and secondary school mathematics teachers out of these 148 copies only 138 (93%) copies and all 10 (100%) copies of the principals were filled in and returned. More specifically, from the distributed questionnaires 138 (93 %) of SSMT and 10 (100%) of the principals were filled in and returned. Interview was conducted with 10 MT, 10 principals and 10 sub-city level supervisors. Totally, 158 respondents were participated in this study. The table below gives detail information regarding the distribution of the respondents by sex.

Table 2: Descriptions of respondents by sex

Items	**Mathematics Teachers**		**Supervisors**		**Principals**		**Total respondent**	
Sex	N	%	N	%	N	%	N	%
M	123	89	8	80	9	90	140	89
F	15	11	2	20	1	10	18	11
Total	138	100	10	100	10	100	158	100

As indicated in table 2, of the total 158 respondents 140 (89%) were males while 18 (11 %) were females. The table also portrayed that the sex proportion across the three types of respondents. Accordingly, from the teachers the largest proportion 123 (89%) were males while15 (11%) were females. On the other hand the males in principals constituted about 9 (90%) while the females accounted 1(10%).This implies that participation of females in teaching mathematics and in leadership positions were very low in secondary schools of sampled site of the city.

Table 3: Description of Respondent by Age.

Items	Mathematics Teachers		Supervisors		Principals		Total Respondent	
	N	%	N	%	N	%	N	%
20-30	91	66	2	20	1	10	94	59
31-40	32	23	5	50	7	70	44	28
41 and above	15	11	3	30	2	20	20	13
Total	138	100	10	100	10	100	158	100

As indicated in table 3, in the age distribution. The majority of the respondents were found between 20-30 years of age which constituted, 94 (59%) of the respondents regarding the age distribution at different groups of respondents, the majority of SSMT were in the age intervals of 20-30 which accounted 91 (66 %). The remaining age proportions 32 (23%) and 15 (11%) were in the age range of 31-40 and 41and above with regard to principals, 1 (10%), 7 (70%), and 2 (20%) were in the age range of 20-30,31-40 and 41 and above years respectively. In the case of sub city level supervisors, which constituted, 2 (20%), 5 (50%) and 3 (30). Are in the age range of 20-30, 31-40 and 41 above years respectively. This shows the majority of principals are in the age range of and 31-40 and 41 above years. Hence it is highly expected being model in conducting action research for young teachers.

Table 4 description of respondents by year of teaching experience.

Year of service	Secondary School Mathematics Teacher (SSMT)		Principals (PR)		Total respondent	
	N	%	N	%	N	%
5 and below	15	11	-	-	15	10
6-10	72	52	2	20	74	50
11-15	35	25	6	60	41	28
16 and above	16	12	2	20	18	12
Total	138	100	10	100	148	100

As one can be seen in table 4, the year of teaching experience of SSMT were 5 and below years which accounted 15 (11%) of the total respondents.72 (52%), 35 (25%) and 16 (12%) of the respondents had year of teaching experience 6-10, 11-15, and 16 and above respectively. Higher service years enable teachers to possess information about action research in secondary school in conducting action research to solve many educational problems because of this long time experience.

Table 5. Descriptions of Respondents by qualification

Qualification	**SSMT**	**SSPR**	**Total respondent**

	N	%	N	%	N	%
BA/BED	122	88	6	60	128	86
MA/MSC/MED	16	12	4	40	20	14
Total	138	100	10	100	148	100

As indicated in table 5, out of the total respondents 122(88 %) were first degree holders who were qualified to teach at secondary school levels of sampled schools. The largest portion of SSMT 122 (88 %) had first degree while 16 (12%) were masters graduate. Moreover out of the total respondents 128 (86%) and 20 (11%) were first degree and second degree holders respectively. 6 (60%) of principals were degree holders while 4 (40%) were masters graduate.

As per the guideline of the Federal Ministry of Education (1994), the Minimum qualification requirement to teach in secondary schools was degree. Similarly the minimum qualification requirement for secondary schools principals was also degree. Based on this all secondary schools mathematics teachers all principals in the sampled schools were degree holders and above. In line with this, all principals and mathematics teachers fulfilled the required qualification in the sampled site of the study area in Addis Ababa. From these it's believed that they are able to conduct action research.

Table 6: Descriptions of Respondents by Teaching workload per week in periods

Teaching work load per week in periods	Mathematics teachers	
	N	%
1-10	13	9
11-15	74	54
16-20	51	37
21 and above	-	-
Total	138	100

As portrayed in table 6, out of the total mathematic teachers 13 (9%), 74 (54 %), 51 (37 %), had teaching work load of 1-10, 11-15 and 16-20 periods per week respectively.

The teaching work load per week in periods for 13 (9%) teachers is below 11 period regarding principals, out of 10 (100%) none of them have teaching work load per week. This indicates that the school principals had an adequate time to facilitate and guide the action research activities in secondary school.

4.2. Analysis and interpretation of data related to practices and challenges of mathematics Teachers in conducting Action Research

This part deals with the presentation and analysis of data related with practice and challenges of mathematics teachers in conducting action research. The data were analyzed based on the response obtained from 10 secondary school teachers principals and sub-city level supervisors.

4.2.1. Support

A set of questions were forwarded to mathematics teachers and principals to investigate whether they have received support before and after starting action research in secondary schools.

Thus, a question “Did you get any training for action research before you began conducting action research in secondary school?” was forwarded to the respondents. Accordingly, the responses to the question are presented in table 7.

Table 7 Respondent’s agreement on the presence or absence of pre-service training for action research.

Respondents	Options			
	Yes		No	
	N	%	N	%
Mathematics teachers (MT)	39	28	99	72
Principals	2	20	8	80
Total Respondents	41	28	107	72

As illustrated in table 7, 39(28%) of SSMT 2 (20%) of principals responded positively. This accounted 41(28%) of the total respondents on the contrary, 99 (72%) of SSMT and 8 (80 %) of the principals answered that they didn't get the pre-practice training for action research according to this data, out of the total 99 SSMT(72 %)and SSMT, 8 (80%) principal did not get pre-practice training on action research. This does not include their study the university. Thus respondents without pre-practice training may be challenged when they started conducting action research in the school later on.

In order to solve the challenges, all teachers in general and secondary school mathematics teachers in particular and principals should get pre-practice training. To find out why teachers and principals did not get the pre-practice training, and in services training as well. On open-ended question was posed to the respondents. The majority of the respondent groups noted that lack of well trained experts, lack of initiation and sense of responsibility on the part of supervisors and teachers. In addition to this, they added luck of knowhow and systematic follow up on the part of sub-city level education office (SCLEO) experts and principals. The researcher interviewed the SCLEO as to why pre-practice training was not given to teachers in general and mathematics teachers in particular before they started conducting action research in secondary school.

Sub-city level supervisors (S_1) in the interview said that:-

"The school principals and supervisors were expected to give training for school teachers but the problem that I thought is that the transfer of experts has its own impact on practicing action research in secondary schools." (S_1, 14/10/2014).

Likewise, in the focus group discussion of teachers (FGD), one of the participants asserted that:

"Most of the teachers are still considering that their duty is only teaching, I believe that they need short term training about research work in general so as to change their thinking of teaching only" (23/10/2014).

Table 8, reasons for not receiving support in practicing action research.

No.	Items	SSMT		Principal			Sum
		N	%	N	%	N	%
1	There is no Research coordinator at any level for this purpose	9	7	1	10	10	7
2	Lack of commitment both in the teachers and administrators	50	36	7	70	57	39
3	Lack of budget for this purpose	37	27	2	20	39	26
4	Lack of expertise in research area	47	30	-	-	42	28
Total		138	100	10	100	148	100

As indicated in table 8, item 1, illustrated that 9(7%) of SSMT and 1 (10 %) of principals responded that there was no research coordinator in sufficient manner at any level for the purpose of support. This response accounted 10 (7 %) of the total respondents. Those who replied lack of commitment on both the teachers and administrators of the were considered as a major reason for the absence of assistance in practicing action research accounted. 57 (39 %). That is 50 (36 %) of the SSMT and 7 (70 %) of principals.

Regarding items 3 in the table 8, "lack of budget on the part of in practicing action research which considered as a minor reason for the absence of support which constituted 39 (26 %) of the total respondents. The last item in the same table which says "Lack of experts regarding research" as a reason for not receiving assistance in practicing action research accounted 42

(28 %). That is 42 (30 %) of SSMT and none of principals noted that lack of experts as a reason for the absence of assistance followed by a question. “Lack of commitment on both the teachers and Administrators”.

The interview made with sub-city level supervisor (S_2) revealed that:-

> *“The budget was very few for research work in the school, this may be due to less or attention given to action research. Hence there seems no body who works on the issues of action research with sense of ownership.”* (15/10/2014).

Supporting this idea ,one of the participant of FGD asserted that:

> “*The absence of any form of incentive or lack of sufficient budget from both the school Administration and sub- city level education office are the major problems that discouraged the teachers to take initiatives to involve in research activities”*

From this the researcher understood that lack of awareness and lack of professionals knowledge on the part of supervisors were the major barriers in order to conduct action research in an appropriate and relevant manner. In addition to this the shortage of budget and the absence of efficient coordinators were also cited as series obstacles in order to conduct action research in secondary school of Addis Ababa city administration.

Challenges /difficulties of Mathematics Teachers in Conducting Action Research.

Regarding challenges that affect in conducting action research in secondary schools the two respondents, Namely, SSMT and principals were asked to replay by saying ‘Yes” or “No” in the table below.

Table 9. challenges that affect SSMT in conducting action research.

Problems/challenges	SSMT		Principal		Total Respondent	
	N	%	N	%	N	%
Lack of available resources	7	5	-	-	7	5
Lack of motivation on the part of teachers	36	26	4	40	40	27
Lack of funds to conduct action research	8	6	-	-	8	5
Lack of coordination between teachers and school administration	12	9	-	-	12	8
Shortage of time to conduct action research	27	20	1	10	28	19
Lack of systematic follow up	6	4	2	20	8	5
Lack of incentives	11	8	-	-	11	8
Lack of awareness	31	22	3	30	34	23
Total	138	100	10	100	148	100

Accordingly, the sub-city level supervisors were interviewed on what major problems/challenges of mathematics teachers in secondary school encountered while practicing action research the interviewees revealed that the practices of action research in secondary school are still at its infancy stage. As a whole the problems raised by the experts were similar to what the principal forwarded. Accordingly an open ended question was presented to math teachers and principals responded their suggestion to overcome the problems for the future. Thus they suggested the following solution, all educational research should address interest of teachers and principals, teachers should be given personal benefits to motivate them teachers should be certified after completion of a certain action research; there should be a convenient place in order to conduct action research assigning trained and capable supervisors, the follow up mechanism should be consistent; An adequate budget should be allocated to visit other secondary schools and share experience with same reference books concerning educational action research should be available to all principals and teachers in general and Mathematics teachers in particular. Mentors should be continuously supported by well-trained researcher

and well trained research trainers should be available in the school as well as in different education sectors.

The extent to which secondary school Mathematics teachers involved in action research were very low or so limited. Majority of the research participants have reported that the effort made by mathematics teachers to do action research was almost in existent. Most of Mathematics teachers have distanced themselves from any research endeavor. Similarly another informants explained the research conditions of the teachers by saying "every individual teacher know he/she must do action research but we have lacked commitment and courage to make it. This implies that action research practices mathematics were not common and popular among secondary school mathematics teachers of Addis Ababa.

Secondary school mathematics teachers with long service year and experience should have to conduct research, and be models and advisors to the young teachers. However; this was not observed in the school.

In this connection one of my informants who is the sub city level supervisor (S_3) said that:-

> *"Current action research situation in the schools and teachers' participation to do research is rare case in our sub city, I can say that involvement of teachers in general and mathematics teachers in particular in action research activities is very low or insignificant. Most of the teachers have distanced themselves from any research endeavor, and as a result no model teacher who initiates you to involve in action research activities" (* $S_{3,}$ *16/10/2014).*

This view shows that action research practices were not common and popular among secondary school teachers of Addis Ababa city Administration. Moreover one of teacher ($T_{1)}$ expressed his idea in the interview as follows:

> *"I had never did any action research since I graduated. Now I have an intention to perform action research in the future."* ($T_{1,}$ 20/10/2014).

Teachers with long service years and experience should have to conduct action research however, this was not observed in the school.

Another research participant in the FGDs described his complaints with regard to lack of competence in research skill and problem in the following way.

> *"Some of teachers did not take any training about action research on the other hand the course we had taken at university was not adequate to do research and we have very little awareness about it, but we are obliged to do action research under the conditions we have lacked research skill and knowledge. It could not enable us to initiate research works in the school."* (23/10/2014).

According to the views of this informant; lack of quality and adequate prior training or shortage of knowledge on action research was obstacle to involve in it. Moreover, it was found out that shortage of research skill consequently turned the teachers to be less confident to involve in action research.

One of another my informant (T_2) in the interview said that:-

> *"I and other teachers have low level of interest in research for the main reason that we have very little training on action research teaching uses besides lack of adequate knowledge made many of us less confident to involve in research activities."* (T_2,26/10/2014).

In the same way other my informant in(T_3) the interview has also said that:-

> *"Many teachers do not have real interest and initiation in research activity because of the absence of incentives, or rewards as result they are poor in their research activity."* (T_3, 26/10/2014).

According to them, many of mathematics teachers used to related interest in doing research with promotion, or rewards, that is they claimed that they are not interested in research because there is no promotion or rewards expected of conduction action research.

In general, from the data, it can be concluded that teachers who have better knowledge and perception about action research tend to have better interest and commitment in it while teachers who have less knowledge or orientation tend to have less interest and commitment in

it. Therefore it appears that knowledge, skills, perception, interest and commitment in action research are very closely involved with each other.

It is essential for mathematics teachers to become familiar with the current educational issues in general, and with the current trends of action research in particular. Nonetheless, the findings of this study reveal that there was hardly worthy individual effort made by the secondary school teachers to improve their prior training, or to acquaint themselves to contemporary educational research methodology. Particularly to the techniques of action research.

In this regard ,for example, one of my informants in FGDs described the teachers' situation as follows.

> *"Most of the teachers do not strive to improve their research skill, they do not show significant efforts to update themselves and they do not strive to have techniques of action research through their own self effort and initiation and he said that the teachers simply engaged in their teaching commitments."(23/10/2014).*

Similarly, during the school observation and document analysis, the researcher observed that all teachers did annual lesson plan for only the lesson they teach in the class and all mathematics teachers do not have any plan of conducting action research in the sample school. Besides as the researcher observed the school environment of the sample school , in some school have a few computer which are not enough even for both secondary and preparatory students and in some other sample schools most computers were not functional.

In the document analysis of in a certain sample school, the researcher observed

that there were a written plan about research work in the strategic plan of the school but any written document about action research conducted by mathematics teachers were not observed.

Generally, informants' response and the observation results showed that however secondary school mathematics teachers prepare plan including action research many of them do not conduct regularly from the problem they face. Thus lack of proper implementation and omitting the regular plan of conducting action research made teachers hinders the effectiveness of their instruction to achieve the

intended objective. As a result, these have negative impact on students learning and achievement of mathematics.

Most research participants gave a similar idea with above mentioned regarding the teachers individual self effort to understand action research.

In general, the present study understood that most mathematics teachers did not make worthy individual self effort to update themselves through informal systems of learning about action research through individual reading, on research literature, accessing and learning from internet.

Regarding training from the school, Woreda and sub-city level education office and administration bodies, the study has indicated that there was no satisfactory training given to mathematics teachers. For examples one of the research participants described the situation by saying one of the major problems was that it is very rare or you cannot find or see expert who is capable of evaluating research works and of giving feed backs in the school or sub city level office.

From these perspectives, the need to improve the quality and relevance of training programs to both the appraise and the appraisers seems quite obvious because lack of training on action research may lead to the perception that action research is too complex.

Consequently mathematics teachers principals and sub city level supervisors were also asked to respond their own suggestion on the content and over all implementation procedures of action research some of the ideas put forwarded were

There should be well-trained experts at sub-city level who can give training and feedback regarding action resource, arranging training, seminars or workshops on education in action research methodology in order to boost the capacity of secondary school mathematics teachers, establishing advisory team at school and sub-city level, individual teachers need to strive to improve their research skill through self-effort and commitments, establishing mechanisms of motivation to all teachers in general and Mathematics teachers in particular towards action

research, and attempting to improve and enhance the support system both at the school and sub-city level.

The suggestions proposed seen to provide immediate responses to the challenges which have persisted so long in the research.

CHAPTER FIVE

5. Summary, Conclusions and Recommendations

This chapter comprises of the three parts summary, conclusions and recommendations. The first part of this chapter deals with the summary and major findings of the study the second part deals with the major conclusions, in this part I have attempted to present some concluding remarks and the last part also deals with recommendations according to the major results of the study.

5.1. Summary

The major purpose of this study was to assess the practice and challenges of secondary school mathematics teachers in conducting action research in secondary school of Addis Ababa. To meet this purpose, research questions related to doing action research, awareness and capability of conducting action research of mathematics teachers and in factors influencing M.T from involving AR and mechanisms to conducted AR for the for future in secondary school were considered. To address these basic questions of the study descriptive survey research method was employed. Based on this first secondary schools where selected by simple random sampling method from secondary schools of Addis Ababa city administration. An mathematics teachers were the respondents from the selected school. Thus 149 Mathematics Teachers were selected. Regarding school principals 10 were selected from sampled secondary schools by using availability sampling method. Ten sub-city level supervisors were selected from all sub-sites using availability sampling method.

To collect primary data questionnaire with open ended. And closed ended questions, interview and observations were employed. The quantitative data gathered from closed ended questions were organized edited and tabulated and then analyzed by using frequency and percentage.

The data collected through interview and open ended questions observations and document analysis were analyzed by using narrative description. On the basis of analysis the following major findings were drawn.

- Majority of the respondent did not get pre-service training out of their study in the university

due to lack of steady effort and strong sense of responsibility about action research from higher to lower level.

- Majority of the respondents responded that the school and sub city level education office were the major providers of support for action research in secondary school.
- According to mathematics teachers and principals who had not received support for practicing action research portrayed that “lack of commitment” and “Lack of expertise” on the part of concerned bodies. The major support provided to teachers and principals to practicing actions research were technical support, experience sharing and in some what material supply.
- The respondents replied that they didn’t receive any support in practicing action research in secondary schools.
- According to sub-city level supervisors, at the very beginning, when introducing continuous professional development program, all teachers conduct action research since it was one of the element in CPD. However the former positive attitude of teachers was changed. Particularly the absence of personal benefits and lack of certification after completing any phase of CPD.
- Induction, group activities and mentoring activities were the major strategies employed by secondary school teachers.
- Most of the respondents portrayed that their participation in the continuous professional development program motivated them. To apply continuous assessment, classroom management, active learning method of teaching self initiation and solving students’ problem. Accordingly, the effect of CPD on daily activities in encouraging action research was not satisfactory.

Challenges of Mathematics teachers in conducting Action research in secondary schools.

Conducting action research was encountered with many problems that affect its effective implementation. These include:

Lack of motivation on the part of mathematics teachers, lack of well-trained continuous professional development (CPD) trainers since Action research is one of the elements of CPD, lack of adequate budget, lack of awareness, lack of coordination between the teachers and school

administrates, lack of available resources and lack of systematic follow up are the major. Challenges that affect the practice of action research by mathematics teachers in secondary school.

Lack of initiation on the part of mentors, the absence of certification, lack of consistent support from the concerned bodies and heavy workload were added by the respondents as challenge as affecting the effective implementation of action research by the teachers.

5.2. Conclusions

Based on the analysis and summary of the major finding, the following conclusion were drawn.

- Teachers are the key actors to attain the intended quality of education through conducting action research. This obviously required positive attitude of teachers towards the practice of action research in secondary schools.
- The presence of consistent training and support from concerned bodies are decisive factors for practicing action research effectively by secondary schools of mathematics teachers in Addis Ababa.
- Lack of motivation or personal benefits on the part of mathematics teachers, lack of coordination between mathematics teachers and school administrators, lack of systematic follow up, shortage of well trained action research expert and shortage of adequate funds are highly affecting the effective implementation of action research by secondary schools mathematics teachers in Addis Ababa city administration.

Unless such problems are solved by one or more, it is difficult to expect the satisfactory improvements in day-to-day teachers' activities in general and practicing action research in particular.

In general, through there are encouraging impacts on the CPD programs on daily activities of teachers, because of the multiple problems encountered, one cannot boldly. Speak about the smooth and effective practicing of Action research by secondary school mathematics teachers in Addis Ababa.

5.3. Recommendation

Based on the major findings and conclusions drawn with respect to practice and challenges of Mathematics teachers in conducting Action Research in secondary schools, the following recommendations were suggested

- There should be highly qualified and well trained experts at sub-city level are who able to give support to the overall practice of action research to secondary school mathematics teachers. Having more sub-city level experts of Research, help to build their capacity to conduct training at school level, strengthening their continuous follow up to give immediate response
- Mentor should be consistently assisted so that they can build a potential of self-confidence and to promote reliable knowledge about mentoring action research practices.
- Lack of consistent support and systematic follow up affected in conducting action research, therefore, continuous and sustainable on - site support, awareness creation and feedback provision are mandatory.
- The teachers' need of training should be identified, diagnosis should be made in order to identify needs of teachers in secondary schools.
- The attempt to assign school-based research coordinators at school level should be strengthened in all secondary schools.

References

Abreham Zelalem (2004),Involvement of secondary school Teachers in Educational Research in Afar regional state: Addis Ababa: AAU

Addis Ababa Education office (2006 E.C) “Abstract”

AED/MOE,(2006). Action research in primary school in Ethiopia. Addis Ababa MOE

Allan Feldman and Jim Minstrell (2004): Action Research as a research methodology for the study of the teaching and learning of science .

Altrichter, H. et al. (1993). Teachers Investigate their Work: An Introduction to methods of Action Research. London; N.Y:

Amare Asgedom (2000). “The State of Educational Research in Ethiopia.” The Ethiopian Journal of Education, Vol. 20, No , pp. 19-48 IER:AAU

Aster Alemu (2004). An assessment of Factors Affecting Teachers to carry out Action reseach with special reference of the upper primary school Sidama Zone:Addis Ababa :AAU

Barbara Jaworski (2006): Mathematics Teachers research process , practice and the development of teaching :Oxford ,University of oxford

Best, John W. and Kahan, J. (1999). Research in Education (7^{th} ed). New Delhi: Prentice-Hall of India Private Ltd.

Carr, Wilfred and Kemmis, S. (1986). Becoming Critical: Education, Knowledge and Action Research. G. Britain and the Flamer Press.

Charles (1988). Introduction to Education Research. New York: Logman.

Cohen L. And Mannion (19 94), Research methods in Education(4th Ed). London:Rutaledge

Corey, Stephen Maxwell (1953). Action Research to Improve School Practices. New York: Horace Mann-Lincoln, Teachers College of Colombia University.

Degarege, Minale (19 99) “The nature of reseach” Addis Ababa, AAU

Derebssa Duffera (2000). “Factors Influencing Research Undertaking in the Institution of Educational Research (IER)”. In Amare et all eds.

Elliot, J. (1988). “Teachers as Researchers”. In John P. Keeves (ed). Educational Research, Methodology, and Measurement: An International Handbook. Oxford: Pergamon Press.

Firdisa Jabessa (2000). “Impediments to do Satisfactory Educational Research Work in Line with the NETP: The Case of Oromia Region”. Proceedings of National Conference on Current Issues of Educational Research in Ethiopia. Addis Ababa: AAU Pri. Press, pp. 43-68.

Hopkins, D. Charles (1993). A Teacher Guide to Classroom Research (2nd ed.). Philadelphia: Open University Press.

Hussen Eshetu (2000). “Determinants of Teachers’ Involvement in Conducting Educational Research: The Case of Secondary School Teachers in Dessie”. In Amare Asgedom et al. (eds). Proceedings of National conference on Current Issues of Educational Research in Ethiopia. Addis Ababa: AAU Printing press, PP. 235-248.

Kemmis, S. (1983). The Action Research Planner. Geelong: Deakin University Press.

McNiff, J. (2001). Action Research: Principles and Practice. London: TJ International Ltd Padstaw, Congnwall.

Merriam S.B(1998). Case Study Research in Education: A qualitative Approach. Sanfrancisco: Jossey Base Publisher

MOE (1994). Educational Sector Strategy. Addis Ababa: EMPDA.

MOE(1994). Education Sector Development Program,1997-2001 AA: MOE

Schmuck, R.A. (1997).Practical Action Research for Change. U.S.A (California): Pearson Skylight Training and Publishing, Inc.

Sarah Ultan Segal(2009). Action research in Mathematics Education;Bozema, Montana

Seyoum Teferra (1998). The Current Status of Research. Activities Among Addis Ababa Senior Secondary School Teachers. The Ethiopian Journal of education. Vol. 18 No. 1. Addis Ababa: AAU Printing Press.

Stenhouse, L. (1975).An Introduction to Curriculum: Research and Development. London: Heinemann.

Stuart J.S.(1991) Class room Action research in Africa:A Lesotha case study of carriculum and professional development in Lewin, K.M.Educational Inovations in developing countries. Malaysia;Macmillan Press.LED

Sukhia, S.P. (1983). Elements of Educational Research. New Delhi: Allied Publishers Pvt. Ltd.

TGE(Transitional Government of Ethiopia)(1994)Education and Training Policy.

Yalew Endawoke (2000). "Research Activities, Problems and Future Directions: An Investigation of Elementary and Secondary School Teachers' Involvement in Educational Research." Proceedings of National Conference on Current Issues of Educational Research in Ethiopia. Addis Ababa: AAU Printing Press, pp. 249-263.

Yeshimebrat Mersha (2000). "Assessment of Secondary School Female Teachers' Involvement in Research Activities in the Amhara region". In Proceedings of National Conference on Current Issues of Educational Research in Ethiopia. Addis Ababa: AAU Printing press. PP. 265-277

Yibeltal Asfaw (2006). Assessment of factors affecting Teachers to Conduct Action research in Anbo General Secondary School: Addis Ababa University

Appendix I

Addis Ababa University

College of Education

School of Graduate Studies

Questionnaire for Secondary School Mathematics teachers

The purpose of this questionnaire is to collect relevant data or information from secondary school mathematics teacher of Addis Ababa city Administration about their involvement in conducting action research and indeed, about factors facilitating or hindering their engagement in action research. To this end, your cooperation in taking part in this questionnaire is a paramount importance for the study. Since your responses will be kept confidential, please feel free to answer all questions or provide your opinion frankly as much as possible.

Thank you in advance.

Notice :

1. No need of writing your name in the questionnaire.
2. Put the mark "√" in the box in front of your choice.

Part 1.

1. The school Name _____
2. Sex A. Male ☐ Female ☐
3. Age A) 20-30 years ☐
   B) 31-40 years ☐
   C) above 41 years ☐
4. Qualification A) MA/MSc/MEd B) Bed/BSc ☐

5 Service Year in teaching profession

A) 1-5 years ☐ B) 6-10 years ☐

C) 11-15 years ☐ D) Above 15 years ☐

1. Teaching Load per week
   A) 1-10 Period ☐ B) 11-15 period ☐
   C) 15-20 period ☐ D) above 20 ☐

Part 2

1. Have you ever taken any research course before?

   A) Yes ☐ B) No ☐

2. Did you conduct action research after you graduate from college /university/

   A) Yes ☐ B) No ☐

3. How many action researches you conducted before

   A. 0 ☐ B. 2 ☐ C. 3 ☐ D. 4 E. more than four ☐

   F. no research at all ☐

4. How is your basic knowledge for conducting action research for different problems in education?

   A) high ☐ B) Medium ☐ C) Low ☐ none ☐

5. Do you have necessary skill in conducting action research?

   A) Yes ☐ B) No ☐

6. Do you think that action research is necessary for the subject mathematics?

   A) Yes ☐ B) No ☐

7. Are you capable of conducting action research now?

   A. Yes ☐ B) No ☐

8. Do your school create different mechanism for mathematics teachers in conducting action research? A) Yes ☐ B) No ☐

9. Are there necessary awareness in your school in conducting action research?

   A) Yes ☐ B) No ☐

10. Does your school encourage teachers to conduct action research?

    A) Yes ☐ B) No ☐

11. Does mathematics Department prepare yearly plan regarding action research?

    A) Yes ☐ B) No ☐

12. Does your school has sufficient budget in conducting action research?

    Yes ☐ B) No ☐

13. What is your commitment in conducting action research?

    A) High ☐ B) Medium ☐ C) Low ☐ D. No commitment ☐

14. Do you have enough time to conduct action research?

A) Yes ☐ B) No ☐

15. Are there supporting material or reference books which are very helpful to conduct action research in your school?

A) Yes ☐ B. No ☐

16. Is there any responsible body for reading and coordinating any study end research study in your school? Yes ☐ B) No ☐

17. In order to make any plan in your school action research

A) Necessary ☐ B) Not necessary ☐

18. Is there any clear school instruction in order to do action research?

A) Yes ☐ B) No ☐ C) I don't know ☐

19. Is there any expert or professional, who can help you conduct action research in your school?

A) Yes ☐ B) No ☐

20. Does the community or the society support to conduct action research in the school?

A) Yes ☐ B) No ☐

21. Is there an experience in discussing on the action research done in your school before?

A) Yes ☐ B) No ☐

22. Is the action research taking as one of the criteria in teachers carrier structure in your school?

A) Yes ☐ B) No ☐

23. Would you mention the support that the school contributes in conducting action research?

24. Would you mention the big problems that challenge you in conducting action research?

25. What are the other challenges in conducting action research in your school

a. _____
b. _____
c. _____
d. _____

26. What are the factors that influencing you from doing action research

Appendix II

Addis Ababa University

College of Education

School of Graduate Studies

Questionnaire for secondary school Principals

The purpose of this questionnaire is to collect relevant data or information from secondary school principals of Addis Ababa city Administration about action research. To this end, your cooperation in taking part in this questionnaire is a paramount importance for the study. Since your responses will be kept confidential, please feel free to answer all questions or provide your opinion frankly as much as possible.

Thank you in advance.

Notice:- 1) No need of writing your name in the questionnaire

2) Put the mark "X" in the box of poor choice

Part 1

1) The school Name _____

2) Sex A. Male ☐ Female ☐

3) Age A) 20-30 years ☐

B) 31-40 years ☐

C) Above 41 years ☐

4) Qualification A) MA/MSc /Med ☐ B) Bed/BSc ☐

5) Service Year in teaching profession

A) 1-5 years ☐ B) 6-10 years ☐

C) 11-15 years ☐ D) Above 15 years ☐

Part 2

1) Are you interested to motivate mathematics teachers to undertake action research in your school? Yes ☐ No ☐
2) Do you lighten the work load for those teachers who conduct action research in your school? Yes ☐ No ☐
3) Is there some form of incentive for conducting action research in your school?
   No ☐ B) Yes ☐
4) Do mathematics teachers conduct action research Yes ☐ No ☐
5) Do mathematics teachers have awareness of conducting action research?
   A) Yes ☐ B) No ☐
6) Does your school have plans or intentions to conduct action research?
   A. Yes ☐ B) No ☐
7) Is there any research coordinating unit or concerned body in your school?
   A. Yes ☐ B) No ☐
8) Are there adequate reference materials and documents that helps mathematics teachers to conduct action research in your school?
   A) Yes ☐ B) No ☐
9) Have you ever formed any seminar, workshop or in service training to update the teachers skill in conducting action research?
   A) Yes ☐ B) No ☐
10) Did you include the issue of action research while you have practicing in the school?
   A) Yes ☐ B) No ☐
11) Do you give support for mathematics teachers in order to develop their culture of doing in action research? A) Yes ☐ B) No ☐

12) How is the commitment of mathematics teachers in conducting action research in your school?
   A. Very high ☐ B. Medium ☐ C. less ☐ D. Poor ☐
13) Are there available resources in conducting action research for mathematics teachers in your school? A) Yes ☐ B) No ☐
14) Is there coordination between mathematics teachers and school administration in

conducting action research. A) Yes ☐ B) No ☐

15) Do you use action research conducted by teachers as a one criteria for teachers evaluation or teachers work performance in your school?

A) Yes ☐ B) No ☐

16. What are the factors influencing mathematics teachers from involving and doing action research?

APPENDIX III

Addis Ababa University

College of Education

School of Graduate Studies

Interview Guide for Mathematics Teachers

The propose of this interview is to collect relevant data or information from secondary school teachers of mathematics about their involvement in education action research and, indeed, about factors facilitating and/or hindering their engagement in research activities. To this end, your cooperation in taking part in this interview is a paramount importance for the study. Since your responses will be kept confidential, please feel free to answer all questions or provide your opinion frankly as much as possible.

Thank you in advance.

1) What is your idea in order to practice and improve conducting action research in the school?
2) What action research did you conduct up to now?
   - How many? Can you show me?
   - On what issues?
   - How you did it?
3) Why did you conduct action research?
   - Or for what purpose and you under taken action research?
4) What concrete practical steps or actions need to be initiated in the near future to improve your involvement in Action Research?
5) Why you didn't /don't undertake Action Research? (what factors hindered you to undertake Action Research in the period under discussion?)
6) How do you evaluate your competence in Action research practice?
7) Have you ever taken any research methodology courses? Was the training you had taken at college /university level adequate to conduct research in your profession?

8) If you hadn’t taken the course, how could you managed to conduct action research or to solve practical problems in your classrooms and/or school?
9) Have you ever participated in any in –service training, seminar or workshop to update your research skill? What is your view about?
10) Many school mathematics teachers may think that their primary task is teaching and that any research activity shouldn’t interfere in their primary task. What would you say to them

APPENDIX IV

Addis Ababa University

College of Education

School of Graduate Studies

Interview Guide for secondary school principal in Addis Ababa city Administration

The main purpose of this interview is to get valid information from school principal about secondary school teachers' involvement in educational action research my objective is to come up with suggestions for action that would contribute to the effort will be done in the future to enhance Mathematics teachers' involvement in action research at school level. In this regard, you will play an important role. That is why I am initiated to ask you some questions please answer the questions that I am going to ask you by sharing your experience and opinion. The data (the information you give) will be used only for research purpose and will be confidential and will not affect any body in any way.

Thank you for your kind cooperation.

1. How is the research (Action Research) status of mathematics teachers in your school?
2. How do you evaluate the past –present trends of Action Research practice by mathematics teachers in your school.
3. Many teachers might think that their primary task is teaching and may refrain themselves from research practices. So, what would you say to them?
4. How do you evaluate the research conditions of your school (in facilitating) teachers' involvement in Action Research?
5. Why mathematics teachers in your school didn't /don't conduct Action Research? (or, from your perspective, what are/ were the main problems that obstructed teachers to undertake Action Research)?
6. What concrete action can you suggest to alleviate the constrains and help mathematics teachers improve their involvement in Action Research in the rear future?

APPENDIX V
Addis Ababa University

College of Education

School of Graduate Studies

Interview Guide, for sub-city level supervisors

The officials are expected to play an important role in the effort being done today to enhance teachers' involvement in action research. That is why I wanted to ask you some questions, please answer the questions below by sharing your experiences. the information I get from you is a paramount importance for the study. Since your responses will be kept confidential, please feel free to answer all questions or provide your opinion frankly as much as possible.

1. How do you evaluate the Action Research status of secondary school mathematics teachers
2. How do you see the past- present, trends of Action Research practice by secondary school teachers?
3. Did /do secondary school mathematics teachers conduct Action Research? How? On what issue and? For what purpose? If not conducted, why?
4. How do you evaluate secondary school teachers' competence (knowledge and skills, perception, interest motivation, etc) in conducting educational action research ?
5. What procedures you were/are employing to evaluate the status or nature of Action Research process and out comes that have been produced by secondary school teachers.
6. How do you evaluate the support given by you (by the office) for teachers who take part in Action Research practice.
7. How much material and financial support and other facilities were given for the teachers?
8. Have you/you're office/ever organized and conducted an in service training, workshops or seminars to upgrade the teachers' research competences?
9. Is there a research work coordinating unit in the office? If any, how it functions?
10. Why secondary school teachers, you think, didn't /don't undertake Action Research?

(what personal and organizational /environmental factors hindered the teachers' involvement in Action Research?)

11. What concrete steps/actions should be initiated in the near future to get involved more teachers in research work?
12. What you and your office need to do to alleviate the revealing problems and to popularize and disseminate Action Research practice in the immediate future?

APPENDIX VI

Addis Ababa University

College of Education

School of Graduate Studies

Focus groups discussion (FGD) Guide

1) What factors (i.e. personal, institutional or environmental, etc) you think that challenges influence the mathematics teachers from conducting action research.
2) What conditions fulfill on the extent of practices of mathematics teachers in conducting action research.
3) What do you think on the goals of action research specific to the subject mathematics in the Ethiopia context.
4) How is the capability of mathematics teachers in conducting action research.
5) What should be the role of schools in conducting action research to the subject mathematics.
6) How is the contribution of education office in Action research.
7) How can you say about the knowledge and skills that are to be acquired through training and practice for conducting action research specific to the subject mathematics.
8) How is the necessary awareness of conducting action research of mathematics teachers in secondary school.
9) In your opinion how should be the materials and finical supports and other facilities are given for the mathematics teachers for the purpose of action research in the school.
10) What mechanisms you think in order to involve mathematics teachers in culture of doing action research.

Declaration

I Chehos Kebede put my work here and declare that this my original beginner study work and has not presented by any other person for award a degree in any other higher institutions and that all materials used for this thesis has openly acknowledged.

Sign _____ Date _____

Chehos Kebede

This thesis has been submitted for the examination with my approval as Addis Ababa University Advisor

Sign _____ Date _____

Dr. Solomon Areaya