THE IMPLEMENTATION OF ACTIVE LEARNING APPROACH IN TEACHING ALGEBRA IN SECONDARY SCHOOLS OF EAST WOLLEGA ZONE, OROMIA REGIONAL STATE.

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THE IMPLEMENTATION OF ACTIVE LEARNING APPROACH IN TEACHING ALGEBRA IN SECONDARY SCHOOLS OF EAST WOLLEGA ZONE, OROMIA REGIONAL STATE.

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ACRONYMS

BESO: Basic Education Strategic Objective

EFA: Education for all.

EMA: Educational Media Agency.

ICDR: Institute for Curriculum Development Research.

MOE: Ministry of Education.

MDGS: Millennium Development Goals.

NETP: New Education and Training Policy.

OEB: Oromia Education Bureau.

PASDEP: Plan for Accelerated and sustained development to end poverty.

TESO: Teacher Education System Overhaul.

TGE: Transitional Government of Ethiopia.

Abstracts

The major objectives of this study were to investigate practices of active learning, to assess the implementation of Active learning approach and to identify factors affect the implementation of active the active learning approach in teaching Algebra in secondary schools of East Wollega zone, Oromia regional state. Based on this related literatures were reviewed. The research design employed was descriptive survey with mixed approaches. The sources of data for this study were secondary school mathematics teachers, students, school supervisors and principals of the sample schools of the zone. The main data collection instrument was questionnaires for mathematics teachers, students, school supervisors and principals. In addition, supervisors' interview and classroom observations were used to support the data obtained through the questionnaire. Non-parametric statistical tools percentage and qualitative approaches were in order to analyse and interpret data. The study revealed that the school situations and classroom sitting arrangements, number of learners' per-classrooms, lack of specialized trained pedagogical centre coordinators, low facilities in schools, low instructional materials and interest of learners towards learning Algebra through active approach were hindering the implementation of active learning approach in secondary schools of the zone. Improvement is needed for school situations and increasing funding, providing classroom and make number of learners standard per-class, motivating and advising students to increase their interest and training pedagogical coordinators who support the teaching and learning activities in schools were recommended

CHAPTER ONE

Introduction

1.1 Back Ground of the study

Ethiopia is currently implementing its Plan for Accelerated and Sustained Development to End Poverty (PASDEP). The PASDEP's strategic vision is one of rapid and sustained growth primarily through large domestic investments and scaled up development assistance targeted at eliminating the poverty traps that have hindered the development of the country. Strengthening human resource capacity and achievement of the MDGs, of which education is a key element, is a cornerstone of the Government development strategies. To endeavours this implementing active teaching strategies are verydecisive. Especially in 21st century practicing and improving students' mathematical knowledge is very important. SinceMathematics is a tool in which students and youngsters get knowledge and experience about life, they learn how to deal with problems, and apply their knowledge into real life problems, they improve their ability about logical thinking and reasoning, and they are getting ready for their future.

Active learning approach is a process where a learner takes a dynamics and energetic role in his or her education.In active learning the students were partners in the process, while passive learning requires little personal involvements from astudent.Active learning, through which students become active participants in the learning process, is an important means for development of students'skills. In this process, students move from being passive recipients of knowledge to being participants in activities that encompass analysis, synthesis and evaluation besides developing skills, values and attitudes (Savin,et al.,2000).

The implementation of Active learning approach in teaching secondary school has always been a challenge for teachers of mathematics because it is extremely important that students become introduce in to complex and abstract mathematical system of algebra and learn concepts which can be successfully applied.

It is necessary that teachers better understanding of how students learn and recognize that the appropriate content, methods and context could be different in different environments. Implementation of Active learning commonly makes teachers act as guides to the learning process, motivators for further endeavours for student's .As a result of the learner's

participation, such learning is self-reinforcing, which should add to the retention of what is learned. The traditional approach that" only talking is teaching" is not acceptable anymore and it is not sufficient, because it completely ignores the cognitive level and degree of development of each individual student. The role of the teacher is to assist students in this construction process to acquire knowledge however, it is quite clear that simply talking and showing no matter how qualitatively it may be, probably will not significantly improve their learning of such abstract topics. It is recommended that student acquire knowledge by them. As mathematician we are aware of the significance inter connections of different ideas and concepts, which is difficult to recognize and understand. We should not forget that understanding of three kinds of inter connections develops through active and hard explorations of mathematical topics through permanent discovering of new inter connections and relations. Thus ,the primary role of a teacher in implementation active learning approach in teaching algebra in secondary school is to try to move students to take an active part during the class concerning important and difficult concepts ,either through the form of individual opinion or through the form of group discussions.

Meyeres and Jones(1993) have maintained that the implementation of active learning approach consists of three factors, which are interrelated. Theseare: basicelements, learning strategies and learning resources.The basic elements of active learning are: talking, listening,reading,writing and reflecting.These four elements involve cognitive activities that allow students to clarify the question, consolidate and appropriate the new knowledge. The second factorof implementation of Activelearning approach is the learning strategies that incorporate the above four elements. These are small groups, co-operative works, casestudies, simulations, discussions, problem solving and journal writing.Third factor of implementation approach is teaching resources that the teacher uses to encourage students to interact and practice actively in the activities. In a study carried out by Sivan et al.,(1991) students took an education through active learning and students-cantered learning approach. Students' perceptions of the effectiveness of these techniques were evaluated. In our country the number of researches carried out on implementation of Active learning approach in teaching secondary schools Algebra is not sufficient to determine whether it will be as successful as it is in the other countries. Therefore, we need to find answers to the following questions.

Do mathematics teachers have necessary skills to implement Active learning techniques in teaching secondary school? What are factors influencing the implementation of Active learning approach in mathematics classes? And are learners interested to learn mathematics through this approach?

Algebra is an important branch of mathematics; today it is studied not only in high schools and colleges but also in junior schools. Algebra is useful like the other branches of mathematics. Algebra by nature has different types and since the study is about secondary high school algebra it is necessary to differentiate high school algebra from the other types. The knowledge of algebra is useful in other mathematical topics like calculus, engineering and science and technology. For example in geometry, algebraic methods are used when solving geometric problems, especially when synthetic techniques become cumbersome, e.g., the synthetic proof of the Pythagoras Theorem which an average geometry student usually finds somewhat difficult to follow. Similarly, deductive reasoning of vertical, adjacent, complementary, supplementary angles in geometry also makes use of Algebra. Likewise, deriving sum of angles, interior and exterior angles. In analytical geometry, algebraic concepts are also applied. Again, in school algebra substitution plays an important role in problems involving calculus, sequences and series and nature of roots. Factorisation of algebraic expressions is also of importance in school algebra such as in solving of quadratic equations. In high school algebra, the knowledge and understanding of algebra contributes a lot to problem solving and drawing of graphs.

Algebra is one of the oldest branches of mathematics. There is historical evidence that the Babylonians were versed in its methods 4000 years ago. In 2000 B.C the Babylonians used algebraic methods in solving problems. However, they used no mathematical symbols other than primitive numerals. This lack of symbolism in algebra continued for many centuries. Gradually, some of the more common words used in mathematics were abbreviated, which led to a syncopated algebra. Symbolic algebra however, did not begin to emerge until 1500 A.D. One person who can be credited with the early development of symbolic algebra is the French mathematician.

The implementation ofActive learning approach in teaching Algebra is linked directly to critical components such as teachers, students, curriculum
content, learning strategies (methodologies), teaching resources, management and administration (Meyeres&Jones, 1993:3).

Improving the implementation of active learning approach in teaching Algebra through enhancing student learning achievement and outcomes because Ethiopia was one of a country who has a serious international commitment with the respecting Millennium Development Goals (MDGs) and with the signed educationfor all(EFA).

Therefore, in order to gained the improved quality of implemented active learning approach through the coordination of both school community as well as external stakeholders to produce competent, knowledgeable, skilled and committed man power in mathematics.

The effort to implement the active learning approach in teaching mathematics in secondary schools need to meet the learning strategies, teaching resources and basic elementsthat affecting quality of active learning approach in secondaryschools of the zone.

Active learning approaches shift the focus of activity from the teacher to the learners. These methods include active learning, in which students solve problems, answer questions, formulate questions of their own, discuss, explain, debate, or brainstorm during class; cooperative learning, in which students work in teams on problems and projects under conditions that assure both positive interdependence and individual accountability; and inductive teaching and learning, in which students are first presented with challenges (questions or problems) and learn the course material in the context of addressing the challenges.

To examine what is going on and to come up with some recommendation, the researcher's is interested to conduct this study.

1.2Statement of the problem

As critically indicated in Ethiopia Education and training policy document, the previous curriculum design and instructional process suffered from old and traditional methods (TGE, 1994). The curriculum organization emphasized academic knowledge and simple recall of facts by learners that was provided through official curriculum and presented by teachers' explanation using lecture method. Teachers dominate the classroom instruction, where students are passively listening. This encourages the concept of banking information in to the brain of the learner. It is a method where emphasis is given to quantity of learning instead of quality of learning, where scope is more important than depth. In other words, how much information is retained to the intention that to what extent it becomes meaningful and related

to the past experience of the learner? In response to these problems, the new policy of education and training (TGE, 1994:4) emphasizes the development of problem solving capacity and culture in content of Education, curriculum structure and approaches, which focus on the acquisition of scientific knowledge.

According to the views of Leu(1998:1), to make practical this policy document, extensive changes have been to reform the curriculum in different ladders of education, including secondary schools. Based on the general curriculum reform in the country, there have been continuous and revisions in the instructional approach to offer quality learning and practical the interactive, Active learning method.

The researcher of this study is doubtful whether or not the underlying paradigm shifts in the methods of teaching and learning, that have been introduced recently to secondary schools are well understood by all groups implementing them, particularly, mathematics teachers, school principals, school supervisors and learners. The researcher raises this problem from the fact that most secondary schools , mathematics teachers who are currently conducting training after first degree graduation(post graduate diploma students) may be interested to teach in the way that have been taught while they were in schools. In the same way mathematics teachers should be acquainted with the new approach of Active learning to practice as intend. Because mathematics teachers with necessary knowledge, skills and willingness actively involved in the classroom, they are seeking some things new, they are interested to ask and answer, need information to solve a problem. However, if they were not well-informed, the learners come to the encounter withoutcuriosity, without questions and interest in the outcome that leads to passive learning(Silverman, 1996).

All the above concepts and discussions clearly disclose that there is a gap between theory and practice in the implementation of Active learning instructional method. Thus, it seems imperative to assess the implementation of Active learning approach in teaching Algebra portion in secondary schools. The researcherwas also interested to conduct in the East Wollega zone of Oromia Region because the present post graduate diploma mathematics teachers assigned in the secondary schools were widely practiced Active learning approach during their training in higher institutions. However, the old method of focusing on lecture, chalkboard and textbook still prevails and the majority of teachers do not utilize the new approaches. Classroom conditions and school facilities do not permit the practical application of the new approach. The absence of qualified professional assistants in the instructional

process who could contribute to the implementation through giving related supervisory, lack of instructional materials, un standard number of learners in perclassroom and interest of learners towards learning mathematics through active methods seem to hinder the progress. In order to assess whether or not they were really implementing this training in to practice the researcher wanted to conduct this study.

1.3 Objectives of the study

The general objective of this study was to assess the implementation of Active learning approach in teaching Algebra in secondary schools of East Wollega zone, Oromia Regional state. Specifically it was aimed to:

- To assess the awareness and training of mathematics teachers, students, supervisors and principals on the implementation of the Active learning approach in teaching Algebra in some selected secondary schools of East wollega zone;
- To identify factors influencing the implementation ofActive learning approach in Algebra in secondaryschools of East Wollega zone;
- To assess how mathematics teachers apply the Active learning methods in Algebra classrooms;
- To assess the necessary skills and capability of mathematics teachers on teaching Algebra through active methods.

1.4 Research Questions

The following are the basic research questions, which are found to be relevant to guided the study.

1. Do mathematics teachers, students, supervisors and principals have necessary awareness and training about Active learning methods?
2. Do mathematics teachers have the necessary skills and capability of teaching Algebra through Active learning methods?
3. How do mathematics teachers apply active learning approach in their Algebra classrooms?
4. What are the factors influencing the implementation of Active learning approach in teaching Algebra classes?

1.5 The significance of the study

The study was to stimulate the zone,Woreda and other educational bureausto give more attentions concerning the implementations of active learning approaches in teaching algebra in their areas and how to implement in secondary schools.

It may inspire motivations, practices and concepts on the stakeholders so that it will lead better ways of teaching and learning this part of mathematics. This research will be expected to contribute to the existing understanding of the implementation of active learning approach in teaching algebra in Ethiopia secondary schools.

It would be help as an additional information source for other educators who will have interest in conducting research on the implementation of the Active learning approach in teaching Algebra in secondary schools.

1.6 Delimitations of the study

It is useful to investigate the implementation of Active learning approach in teaching Algebra in secondary schools, at national level or in different parts of the country, because the most reliable and valid information may be found if the research study includes a country context rather than a specific zone. However, the boundary of this study is delimited both in scope and depth. It is restricted to treat the implementations of active learning approach in teaching Algebra in some selected East wollega secondary schools. Because of time and financial constraints this study does not include preparatory and primary schools.

The study is limited only five secondary schools and hence the conclusions are limited to the population of the study.

1.7 Limitations of the study

Even though this research is carefully designed and planned, there are certain constraints that restrict the researcher. Limitations are those conditions beyond the control of the researcher that may place restrictions on the conclusions of the study and their application to other situations. The following points are some of the major limitations of the study:

- Geographical locations and distributions of sample schools of the study were not adequate for data collections;
- Lack of internet access and

- Lack of financial sources, time and other resource materials constraint the study.

1.8 Operational Definitions of terms

Active learning: Active learning is a process where a learner takes a dynamic and energetic role in his or her education.

Implementation: is how teaching-learning activity put in to practice in or out of a classroom by learners and mathematics teachers.

Active learning approach: is a process were learners actively involved in teaching and learning activity.

Secondary school: the upper of a divide recognized secondary school, comprising usually grade 9 to10.

Supervision: a system in the operation with distinct purposes, competencies and activities.

Supervisors: Are those persons providing professional support to schools' community including schools principals and teachers.

Class size: number of learners regularly scheduled to meet in administrative and instructional unit.

CHAPTER TWO

REVIEW OF THE RELATED LITERATURE

Introduction

This chapter focuses on review of related literature and research findings, which lays the conceptual frame work of the instructional approach in general and Implementation of active learning methods in particular. It reviewed perceptions and reactions on active learning, and factors that may influence the effective implementation of active learning in mathematics.

2.1 Philosophy of Instructional Approaches

Every instructional approach has its own basic philosophical epistemology. In this sense, epistemology is simple a philosophical term used to describe the concept of knowledge that guides the way we think the system we design and our action. The term instructional approach is interchangeably used with terms like instructional method and instructional technique of course, these terms are confusing. To avoid this confusion, ICDR (1999:61) defines them in the following way. Approach is a set of assumptions dealing with the nature of teaching and learning where as method is an overall plan for systematic presentation of knowledge based up on selected approach. Whereas, technique refers to specific activities manifested in the classroom that are consistent with the method and therefore in harmony with the approach. These three terms are thus related in hierarchical manner, with approach being most general and technique of most specific.

When we come to instructional notions in the contemporary literatures, we find two general notions as the basis of knowledge in general or learning of the individual in particular.

To sum up, a conceptual analysis of the various philosophical ideas underlying the use of instructional approaches is very vital to curriculum designers, text book writers and class room teachers because, directly or indirectly these perspectives influence the theories and methods used by classroom teachers.

2.2 Classification of Instructional Approaches

Different scholars use different types of classifications when referring to instructional methods, sometimes these different classifications are confusing and it is hard to differentiate. According to ICDR (1999:68) the following are among the common classifications of teaching- learning approaches. Teacher- centred versus students- centred method; Direct instruction versus indirect instruction and Traditional versus non- traditional method.

Thought these classifications of instructional methods use different terminologies, mostly they have a similar conceptual frame of reference in that the degree of students' participation in the instruction process is the common bases of all the above classifications.

2.2.1 Teacher- centred Approach

In the old models of teaching, often called teacher- centred, the teacher is the centre of the classroom activity. The teacher has been thought to hold most of the knowledge necessary for students to be successful. In this model, the teacher use the lecture method "chalk and talk" or other methods of teaching in which he/she in active and the students remain passive. When the teacher asks questions, the students were usually expected to recall or repeat information from the lecture or from the text books. This is thought to be the most effective method of teaching in order to get most of the information to the students (Borich, 1984). However, many scholars in the field of pedagogy emphasize its disadvantages rather than its advantages. Accordingly, the following points are some of the shortcoming mentioned by scholars. Since traditional approaches have no variety, they became monotonous and boring. The learning process depends on the talking of teacher where the learner becomes a passive listener.

Moreover, it inhibits active participation and research ability of the learner and encourages him or her to be submissive (Yallew, 1999:27).

The teacher-centred method gives emphasis to the teacher as a knowledgeable person of the subject matter. Although the role of the subject matter specialist cannot be underestimated, equally important factors are the students and their experiences whose role have not been recognized. Yet, the recognition of students' activities in learning does not go beyond lip service by educational authorities (Leu, 1999 in DestaAbera M.A Thesis). It focus on content, emphasizes knowing what students work as individuals and often in competition with each

other. Students are highly dependent on the teacher's activities and learning objectives are imposed; lecture dominates as the mode of curriculum delivery.

2.2.1.1 Features, Advantages and Draw backs of Teacher- centred Approach.

From the work of chirckering and Gamson (2002); ICDR(1999); the features of teacher-centred teaching are:

Teacher is the centre of teaching and learning process, leaving the students aside, most of the class is present material from the textbook or from the teacher's notes. The material is written on the board, and the students notes, most class time is spent with the teacher talking and students watching, listening and coping notes where individual work or assignments, and co-operations discouraged, and most of the questions are asked by the teacher, and teachers present information for the learners to learn, and learners demonstrate what they have learned this information with responses to questions. Most traditional classroom lacksfree wheeling thinking and open-ended discussion even though it is much more important in the teaching-learning process than flow of information (Brandle, et al. 1994: 4 in AmenuOljira M.A Thesis). From Kaplan (1990) in ICRD (1999); CliverCarre(1981) in Bentely and Watts (1995), the Advantage of teacher-centred teaching are: it helps to coverlarge amount of information in short period; it is effective to teach well-structuredinformation that can be taught in a step by step fashion; and help to teach new materials for disadvantage and learning disabled students. But, it does not permit to meet heterogeneous needs of the class, make students to be passive recipient; create a false sense of sense on teachers, students and parents….etc

1.2.2 Student-centred Approach

The purpose of education is to develop intelligence and skill to live. The old school curricula and instruction, which focuses on rote memorization, passive learning and lower order thinking, are found to be wasteful. The emerging new society is an information society. It needs flexible learners who are self -directed, capable of higher order thinking, and skilled in technology of communication (Nardos, 2000:1). The shortcoming of teacher-centred methods has led to bring about changes for the new learner-centred or active learning. The new methods pave the way for learner's active participation under the guidance of the teacher or in a personal initiative forms. This approach adheres to the strong assumptions of the learners to

be active rather than to be passive. In fact learning in this approach is associated with doing. The learner is actively involved, so that there can be more connections with the past learning and between new concepts.

The learner-centred approach is sometimes known as the indirect approach. Various studies assured that indirect methods are usually more effective than the direct teaching. The learner-centred approach or indirect teaching requires developing feeling for the appropriateness or various technique and methods for various kinds of learning situations, and expertise in a large variety of methods as well as good command of the subject matter. Changes are built one upon another. This approach focuses on process, emphasizes knowing how, students work independently in groups and teams collectively and cooperatively. Teaching sessions are flexible and are not always classroom based. Teacher is facilitator and a resource for students in a learning partnership (Ellis, 1998: 291-292).

2.3 Direct Versus Indirect Methods

Some educators classify teaching methods as direct and indirect methods of these educators Borich (1984), who characterized direct and in directed instructional methods as follows:-

2.3.1 Direct Instructional Methods

The direct methods are those methods used mainly by teachers to convey information directly to the learners. Here, the teacher mostly uses the lecture method. There are also some other methods that can be include in this methods some of these are:-

Programmed instruction, Computer assisted instruction, Peer, Criticism and Giving directions

2.3.2 Indirect Instructional methods

The indirect instructional methods are, generally speaking, learner- centred approach and these methods include:-

The guided- discovery method, the inquiry method, the group discussion, and using students' idea, and etc.

It is generally claimed that, the indirect methods could promote the development of critical thinking unlike the direct instructional methods that are used for disseminating information.

2.4Active, Learner- Centred methods

2.4.1 Definitions and Concepts

Many educators have noticed that teachers have not used the term active learning with consistency because in relation to teaching methods or learning activities, it is sometimes used to refer to the "mental experience" of learning.

But, Kyrincou (1998:39) notices that in essence, active learning is "how pupils learn" which is as important as the "content of what they learn". It consists of any learning activities where pupils are given a marked degree of autonomy and control over the organization, conduct and direction of the activity. Most usually, activities in active learning involve problem solving and investigational work. It may individualize or involve small group collaboration. Thus, basically, active learning is contrasted with expository teaching in which pupils are largely passive receivers of information which tightly under the teacher's control.

2.4.2 Origin of Active Learning Approach

The development of methods of teaching has been traced back to ancient Greece in various literatures. The most long lived and wide spread sets of teaching methods are those associated with the study of language and literature, Singh , 1989(in ICDR, 1999:62). Ancient educational methods emphasized memorization and analogical reasoning; a form of reasoning in which one thing is inferred to be similar to another thing in a certain respect, on the bases of the known similarity between the things in other respects. The scientific approach to teaching methods began in the 16th century by the Czechoslovakian educator and developed further by such educators like Johan Heinrich, Jean JacquesRousseau and Dewey later on. Also the Swiss psychologies Jean Piaget conducted a number of researches on children development.

2.4.3 The Importance of Active Learning

Chet et al., (1993) notice the role of active learning in solving the loss of attention and in responding to different learning styles of learners. According to them, the importance of active learning depends on two basic assumptions are:

(1) Learning is by nature active endeavour, and

(2) Different people learn in different ways

On the bases of these assumptions, they extended their argument that first students learn best when applying subject matter, in other words, learning by doing; and second, that teachers who rely exclusively on any one instructional approach often fail to help significant numbers of students learn better. As a result, both teachers and students end up with dissatisfaction.

Moreover, as Silverman (1994:4-5) states, active learning clearly addresses the different learning styles of the students, which many educators have realized. Principles of learning styles reveal that some students are visual, they like carefully sequenced presentations of information. They prefer to write down what a teacher tells them and they are quite in the classroom and seldom distracted by noise. But the auditory learners do not bother to look at what a teacher does or to takes notes. They rely on their ability to hear and remember. Whereas, kinaesthetic learners learn mainly by direct involvements in the activity. They tend to be impulsive, with little patience. They want to move about and do. Of course, only few students are exclusively one style of learner; rather, they share more than one. Thus, different active learning methods create the best match for students with different learning styles. Also, practically, in teaching- learning process, a teacher who tries to teach concepts directly is fruitless. Because, a teacher who tries to this way usually accomplishes nothing but empty verbalization, a parrot likes repetition of words by the child simulating knowledge of the corresponding concept but actually covering up a vacuum (Vygotsky, 1986 in Capel et al., 1995:229).

In line with the above ideas, ICDR, (1999: 65-66) lists some basic points on why active learning is considered to be so important.These are:-

Teaching is effective only when students are learning, learning is effective only when it is meaningful to students, learning is meaningful only when students can use it, connect it to their lives or actively participate in it, memorizing facts and bits of knowledge alone is not effective learning, it is to damage young learners, when one tries to teach them only by giving facts because it is preventing meaningful learning, learning facts alone does not prepare students to understand their environment or function effectively in it; it does not prepare them to understand and participate in a complex world, but learning must prepare students to solve problems and to use information from their environment and other sources to make a better life for themselves, their families and their communities (Dewey, 1949) and we must encourage students to use higher-order thinking skills (analyzing, comparing, drawing

conclusions) and move away from the exclusive use of lower-order thinking skills, which is memorizing (Borich, 1984).

Another educator, Kyricou (1998: 39) mentions the following educational benefits of active learning activities.

They are intellectually more stimulating and thereby are more effective in eliciting and sustaining pupil motivation and interest in the activities are effective in fostering a number of important learning skills involved in the process of organizing the activities, also, offer opportunity for progress, are less threatening than teacher talk activities and thereby foster more positive attitudes in pupils towards themselves as learners and towards the subject and cooperative activities in particular enable pupils to obtain greater insight in to the conduct of learning activities through observing the performance of their peers, sharing and discussing procedures and strategies.

To sum up, the use of active learning approach are many and diversified, but the basic contribution is that if students are actively involved in the learning, they will better able to understand new concepts and will learn more which is applicable, long lasting and meaningful in their lives.

2.5 Research findings on Active learning

Research findings consistently have shown that traditional lecture, demonstration and question answer methods, in which teachers talk and students listen dominated secondary schools namely, grade 9-10 and 11-12 and even widely practiced in higher institutions. These directions naturally do not encourage students to be actively participating in teaching-learning. But,practically, all learning is inherently active and that students can learn to extent that they are actively involved in it. In connection to the significance of active, participatory learning, Chikering et al. 1987, (in Bonwell and Eison, (2003), suggests that students must do more than just listen. They must read, write, discuss, or engaged in solving problems. In other words, to be actively involved in learning, students must engage in such higher-order thinking tasks as analysis, synthesis and evaluation.

According to the context of this research, instructional strategies that are promoting active learning can initiate students to involve in activities, or doing things and critically thinking about what they are doing that reveals the real learning.

Cross(1996), delivers a keynote that addresses a challenging issue to develop an environment in which students become actively engaged in learning. Thus, after decades of research focused up on teaching and learning strategy, the effectiveness of active learning model has been clearly documented. However, in the secondary schools there have been challenges to incorporate the new model of active learning in to their classrooms. Thus, some have embraced this approach to instruction with enthusiasms while others seem more cautious in moving towards adoption. Anyway, active learning occurs in an environment where the students are at centre and instruction is student-centred. On the other hand, passive learning occurs in setting where the teacher is the focus, as a result described as teacher-centred instruction.

Another researcher Halperin,(1994), comments on the domination of old instructional approaches in most secondary schools. He suggests that most activities, today in a majority of secondary and higher education continue to reflect an "old style" of instruction where students sit quietly; passively receiving words of wisdom being professed by the lone teacher standing in front of the class. He explains that certainly teacher-centred, passive learning seems richly to describe the minor orbits of the cosmos (students) revolving eternally about the Earth(teacher). In the teacher-centred passive learning, the teachers become the manager of the classroom with the learning process heavily dependent up on the pronouncement and enforcement of rules. Here, note that little is required or expected from the students to the very end. The students are presumably expected to ride the assembly line quietly and dutifully accepting all data transmission in similar manner as an automobile's skeletal frame moves towards the new car dealer's showroom. But practically, most cognitive psychologists and educators agree that instruction is effective when students are encouraged to become actively involved in their own learning. Besides, an allowance of time must be made for meaningful open interaction between students and teachers and groups of students that nurture the student's natural curiosity.

Other researcher, (Grinder, 1991, in Silverman, 1996:5) stresses on different styles of learning. He points out that in every group so that, an average of 22 are able to learn effectively as long as a teacher provides a blend of visual, auditory and kinaesthetic activity trough active learning technique. The remaining students, however, prefer one of the modalities over other two in that they struggle to understand the subject matter unless special care is taken to present it in their preferred mode. This implies that in order to meet these

learners' needs, teaching has to be multi-sensory and filled with variety, which is possible through active learning approach. Moreover, the research findings of SirakDemelash(2000) indicates that about 58% of the class activities in the teacher training institutes where inclined to teacher-centred while 42% where identified as learner-centred. Regarding factors hindering the implementation on Active learning, the study of FisehaAberha (2001) reveals that among other elements, teachers' lack of adequate pre-service and in-service training as well as the way, training materials prepared negatively affected the implementation of Active learning in secondary schools.

2.5.1Active learning in Ethiopian Educational contexts

The curriculum reform initiated in,(1994) in Ethiopia after the adoption of the New Education and Training policy has led to extensive changes in education. One of the changes is the paradigm shift in the model of teaching and learning which involves the shift from rote learning to active learning and the shifts from a linear to an integrated curriculum Lue, (1998:1). This change has brought a major paradigm shift in to our thinking about instructional methods, the underlying ideas like active learning approach, student-centred method, problem-solving, discovery learning. Students' sensitive learning, the use of higher-order thinking skills, etc. have been introduced through this reform. To state more precisely, the paradigm shifts from the traditional passive learning to the new model of participatory, Active learning. In other words, the shift is from positivist epistemologist to constructivist epistemologist, which involve a shift from learning through memorization and repeating information to learning through discover, analysing, problem solving and evaluating to create understand and new knowledge. Similarly, in teacher education system, there have been continual changes in the curriculum and teacher's profile since the education reform in the country. Particularly, at present, the teacher education program is guided by the TESO document (MOE, 2003). This document states that in the teacher education rote, passive learning has to be replaced with active, learner-focused education. It advocates a teacher education system that develops and in calculates higher-order thinking skills in graduates and it emphasizes, as teachers are essentially agents for positive societal change. Also, the New Education and Training Policy of Ethiopia require the development of the physical and mental potential and problem solving capacity of individuals. It is expected to cultivate the cognitive creative, productive and appreciative potential of citizens by appropriately relating education to environmental and societal needs (TGE, 1994:4). Thus, teachers to model

classroom teaching skills and methods that reflects and goes in line with the goals of new education and training policy. In real situation, however, there is an epistemological separation between theory and practice. Because, mostly, it seems teacher's performance in teaching skills is not adequate as the result of their in adequate training. Of course, teachers were less dominating about curriculum modifications and active methods in the classroom, although their standing in the classroom indicated otherwise. Because teacher's pedagogical positions are quite traditional; giving presentation of knowledge and pupil's abilities to think in abstract terms than concrete ways.

2.5.2The Application of Active Learning

2.5.2.1 To make students Active in the class.

For effective instruction, in the begging of any class, it is crucial to get students active from the start; otherwise, there is a risk of passivity. A new class opening activities are necessary to get students to become acquainted with, move about, engage their minds and look their interest in the subject matter. These experiences of getting students active at the outset of the class as Silverman (1996:32) puts are considered as appetizers to the full meal; because they give students a test of what to follow. Nevertheless, usually, on the contrary, most teachers choose to begin a class or a course merely with a short instruction, which does not help to develop a learning environment that involves students, promotes their willingness to take part in an implementing active learning and creates positive classroom norms.

To accomplish the above objectives and to get students active from the start in the class, Silverman suggests three techniques, namely, team building, on-the-spot assessment and immediate learning involvement.

Team building: it helps students to become acquainted with each other and create a spirit of cooperation and interdependence. This techniques promotes an active learning environment by getting students to move physically, to share their opinions and feelings openly and to accomplish something in which they can take pride, being active from the start in the class by developing the team spirit.

On-the-spot Assessment: This technique helps to know about the attitude, knowledge and experience of students prior to the new class. It is designed to help the

teacher to know about his/her class while at the same time involving students' right at the beginning. It allows the teacher to assess specific activities about the students and helps to get an overall picture.

Immediate learning involvement: This technique is designed to plunge students immediately in to the subject matter in order to build their interest, arouse their curiosity, and stimulate their thinking. Because students do nothing, if their brains are not ready. Thus, many teachers make the mistake of teaching too early, before students are engaged and mentally ready. To sum up, to make practical the above three techniques of new class opening, the level of threat, appropriateness to students norms and relevance to the subject matter need to be considered. Furthermore, any class new or regular should avoid hesitation and reservation from students and open to new ideas and activities. It is also important that the teacher should consider his/her audience and plan accordingly.

2.5.2.2 Using different forms of Active learning.

In involving the students in active learning can take different forms. According to EMA (1999:53), active learning takes three forms, namely, thinking, writing and doing.

Thinking: through active learning, the learners may be stimulated of think by being required to do different activities. For example, asked to answer the questions, to make mental notes, summarize interpret facts, make connections between facts, transfer knowledge, and information to daily life, solve problems and make inferences.

Writing:- involving the learners in writing activities is perhaps the most frequently used method in active learning. In this task, when required to a written activity, the learners do not have chance to be passive and dull; instead writing helps to consolidate learning and fix it in learner's mind.

Doing:- through doing, the teachers must try to improve the learners' skills in a practical way. The teacher may ask students to do different activities such as doing class work, experiments', making arts and crafts, reading, interpreting and drawing maps, interpreting maps and constructing tables, charts, and graphs, caring out project, conducting a research, writing report, solving problems and applying their skills in

real life. In relation to this, Heinich et al.(1996) discuss a number of activities that can be performed by learners by using a variety of instructional media. In short, these three forms of active learning requiring every learner to actively involved in different activities in the classroom. so that, avoid passivity and simple absorption of knowledge or facts.

2.5.2.3 Using the major Active, Learner-Centred Methods.

To be effective, teachers must use different Active learning methods. Because current thinking and practice in Education highly advocates the need to actively involve the learners in different active learning techniques. To this end, there are a wide range of methods and techniques for active, learner-centred learning. The major methods are explained below.

Inquiry learning: The inquiry learning method places a great emphasis on a process of learning; students learn by conducting an investigation. The experience itself is important than the results that are found. Inquiry experiences can take place in the classroom, in the library, or outside on a field trip. In inquiry learning, there must be a problem to solve, questions to ask and data to collect. The basic idea behind inquiry learning method is that all people have a natural instinct for curiosity when come across any problem. For any experience to be considered inquiry, there must be a focus on same problem and one of the great strengths of inquiry is its emphasis on experiences (Kaplan, 1990). On the other hand, inquiry learning does not work efficiently for learning lots of facts it consumes time and requires more preparation and continuous monitoring of learning by the teacher.

Discovery learning: Psychologists like Bruner (1966), who were well known advocates of discovery learning, argued that education should emphasize the structure of a particular discipline and important cases rather than fact.Instead of just memorizing certain facts, to discover them for ourselves, will be interested because, the information will stay with every individual long lasting and most importantly. Thus, one will know how to learn more information, that is, he/she will learn how to learn.

The discovery method of teaching is a frequent description of mode of instruction that is contrasted with other forms of instruction like traditional expository, guided didactic, teacher-centred, deductive or dogmatic. Discovery learning is the opposite of reception or being told or being passive. It is commonly equated with inductive learning when the subject proceeds from the specific to the general.

Problem-Solving: The problem-solving approach is no single strategy; rather it is a general strategy in which many different techniques are found. Problem-solving is a process of producing or closing a perceived problem gap. Where solution is proposed, its effect on reducing the gap can be evaluated and adjustments made accordingly, which is known as means-end analysis. In the process of problem solving activity, the most important thing is that pupils should generate more ideas about the stated problems for the major stages of the process (ICDR, 1999).

Role-Play: Role-play is all unrehearsed dramatization, which involves presenting a small spontaneous play that describes possible situations. In role-play, students rely on information in the classroom and real life (MeleseBedane, 1999).

Brain storming: Brain storming as explained by MeleseBedane (1999) is a technique in which everyone's response that applies to the topic is acceptable.

Field Trip: It may include variety of methods like field visit, attachment and inter relationship. This method involves moving the learners out of the classroom. It aims at promoting the experience of the learners and assisting them to acquire knowledge and skills directly from the real world. It requires selecting appropriate and relevant topic, meticulous planning and guidelines, arrangement and cooperation of most organization and sometimes material imputes. Regarding the importance of the field trip to teaching learning process, Melese (1999:17) emphasized that: It is learning value high as it relates to real situation, there is more opportunities to gain wide range of knowledge and skills, as it is practice oriented, learning becomes long lasting, learning can be tuned at the pace of individual learner and it gives a chance to apply and test in practice what has been learned in theory. Therefore, since field trip helps the learners to understand deeply what they

have learned theoretically in the class and help them to relate it with the real world situation, it is one of the most important methods that can help to implement the active learning approach.

Panel Discussion: Panel discussion is one of the participatory methods of instruction. In panel discussion or debates, there are generally two sides, each with opposing views (Walklin, 1989:95). Using, a question or proposition is put forward and each side takes it in turn to speak for or against the assumption. The participants (learners) are mainly concerned with destroying one another's arguments or putting forwards opposing interpretations of evidence under review during the debates.

Group Work: Group work is a part of collaborative strategies of teaching/learning. It is one of the best ways of encouraging active learning by arranging the learners' work together in groups. Regarding the value of group work Silverman (1996:6) emphasized that one of the key ways to attain a feeling of safety and security is to be connected to the other people and to feel included in a group. This feeling of belongingness enables students to face the challenges before them. When they are learning with others rather than alone, they have the emotional and intellectual support that allows them to go beyond their present's levels of knowledge and skill. Placing students in groups and giving them tasks in which they depend on each to complete the work is a wonderful way to capitalize on the social needs of the students.

Discussion: one of the important learner-centred activities is discussion in the classroom. Discussion can be organized by groups or for the whole class. There are three kinds of discussions: prescribed, guided and open. Prescribed discussion is characterized by predetermination of ideas concerning the content and outcome of the discussion by the teacher. There should be the intervention of the teacher where appropriate to steer the discussion along the line he/she wishes. At last, the teacher summarizes the results of the discussion, emphasizing to the direction, which he/she wishes to reach. Generally, discussion is the most widely used technique of instruction, especially as active learning approach.

Peer-Teaching: peer-teaching is a participatory, active and democratic strategy integrated in to the students own experiences that result in deep learning. Peer-teaching involves occasional use of students in the class who have experiences because of their good back ground in a particular area. Peer-teaching is also appropriate method of teaching to apply methodology in training program. The merit of peer-teaching is that each group or member benefits from each other's activities, sharing the experience. Pee-teaching can solve the problem of large class size and it may release teacher's time for personal research (Bennet et al. 1996: 38).

Project work: Project work can bring in to the classroom aspect and dimensions of life that the text books or other instructional materials do not. A project can emanate from the classroom or at home depending on the role that the teacher plays in the origin of project. In other words, whatever be the original conception of the material that goes in to the project belongs to sources outside the classroom. In project method, task or topics are selected, worked, organized and presented to the class.

Thus, projects do the function of bringing in to the classroom aspects and dimensions of experiences (Dewey, 1949) that are not ordinarily available to the classroom. The teacher may employ project method to directly enhance classroom teaching, when he/she chooses areas that are part of his/her work in the class (Mukalel, 1998:77). Similarly, Walklin (1987:235) notices that a project work may be set either as an individual task or as a small group undertaking.

2.5.2.4 Knowledge and Attitudes on Active Learning

For effective implementation of any new perspective, including active learning model, positive attitude on the issues and sound knowledge and skills in the area are very important. Particularly, the underlying ideas, concepts, merits and demerits of the new approach should be clearly understood by teachers, students, principals, parents, decision-makers and the community at large. In this review, the researcher only stresses on teachers, students and educational supervisors.

2.5.2.4.1 Teachers' knowledge and Attitudes.

It is critical that teachers' have a thorough understanding of the nature and characteristics of the appropriate teaching-learning methods to be used in conjunction with curriculum materials. Because, although to a certain extent some decisions may be determined for teachers by official syllabi, students' text books or teacher's guides, it is the teacher who is the ultimate implementer of the curriculum materials (ICDR, 1999:66). But, unfortunately, knowingly or unknowingly, some teachers discourage active, student-centred learning with ground that it brings an extra demand in the planning and preparation of lesson. Some teachers feel as it is bounded by over-crowded subject matter and thus, pressurized by the limited time them covering the portion in difficult or impossible. Even, they come to the conclusion that Active learning may be nice in the theory but, unrealistic in practice. These, all shows that there have been no enough and concrete perception about how to install active learning in classroom, which may leads to negative reactions (Capel et al.1995:229-230). These misconceptions show that teachers have not understood as Active learning enables them to spend more time with groups and individuals to give access to special needs of students and contribute to better and quality learning.

There are many factors that contribute to low perception and negative attitudes of teachers on application of active learning in the classroom.

2.5.2.4.2 Students knowledge and Attitudes.

The new instructional model, Active learning, intends to produce active and motivated learners who can cope with the demands of the modern world. Active learning methods encourage students' autonomous learning and problem-solving skills. It provides pupils with greater personal satisfaction, more interaction with peers, promotion of shared activity and team work, greater opportunities to work with a range of pupils and for all members of the class, to contribute and respond (Capel et al. 1995:230). Similarly, other Authors (Dary and Terry, 1993:38) have stressed the importance of the students past experience, which is a transformative rather than passive accumulation of knowledge. They noticed that unless learners consider the implications of the ideas for them in their own lives and decided to act, know and believe in new ways; they are likely to adopt a passive acquiescence to the students' learning has not made a different because it has not been transformative and at best resulted in some accretion of knowledge. Thus, it is possible to suggest that Active learning

approaches seek the emancipation of learners from the old belief that has dominated methods of teaching over last century. On the contrary, in spite of all contributions of active learning methods discussed above, the students may not have appropriate perception and have developed negative attitudes.

2.6 Curriculum Materials in Implementation of Active learning.

Most textbooks and manuals do not incorporate in an implementation of active learning methods. They only use one-way instruction. In one way communication, the learners reads what has been written but, in no way respondents to the materials. An effective instruction design, however, consists of a two-way process. That is, to say there is interaction between the writers of text and the learners. The learner is therefore, actively involved in the learning process (EMA, 1999:50).

2.6.1 Comparison of Active and Passive learning materials.

There are different active and passive learning materials in teaching and learning process. In order to differentiate them EMA (1999) compare in the following table.

Table1: Comparison of active and passive learning materials

No	Active learning materials	Passive learning materials
1	Two-way communication	One- way communication
2	Learner is actively involved	Learner is passively involved
3	Learner is aware of the structure	The structure is hidden
4	Learner is guided	The learner is self-directed
5	Dialogue is emphasized	Lecture is emphasized
6	Friendly and encouraging relation ship	Impersonal relation ship
7	Learners applies new knowledge and skills	Little application of knowledge and skills
8	Activities and exercise throughout the textbooks	No activities or only few activities at the end of the chapter
9	Assignments for making	No assignments or very little
10	Feedback is provided on learners' progress.	No feedback.

Source: EMA (1999:50).

2.6.2 The Need for Active learning materials

There are a number of reasons for using active learning curriculum materials as noticed in the manual. First, learners should not be forced to learn, thus the developers of the curriculums or the writers of the text needs to make every effort to make learning likely. In other words, for effective learning, the learner should be encouraged and motivated. Consequently, the writers of the curriculum materials have the responsibility of making the text interesting and lively. Moreover, active learning is best done a little of a time. This shows that the writers of the text book must take this in to consideration when developing the materials. In other words, activities, questions and exercises that have been incorporated in the text should ensure learning that proceeds in small steps. Also, to ensure the understanding of students, exercises, self-test and assignments are essential components to be included (Mukalel, 1998:118-119). Generally, active learning materials help the learners to learn effectively. It enables that curriculum developers and the learner build up a dialogue; it motivates learners continuously and encourage them through successfully completion of their work. It checks the learner's progress and enables them to pause and make mental notes of important information.

2.6.2.1 Continuous Assessment and Active learning

Continuous assessment is a type of assessment in which an individual learner is assessed throughout the course of instruction (Taneja, 1996:59). Continuous assessment is used to get information about students' achievements. It is effective use helps for further improvement of teaching and learning. Thus, it has to be considered as part of ever lesson to ensure that instruction is planned, meaningful and relevant to the learner's real life situations (OEB, 2000). As much as possible, it should happen in the course of students' regular engagement in activities rather than being sporadic and unnatural. It is expected to be interesting, engaging and motivating learners for further reading. It must evaluate a process and product and includes three domains of education, namely, cognitive, affective and psychomotor. In line with continuous assessment, making or grading is an important issue. Grading is a method where by grades are determined. It is a process of using a system of figures or symbols for reporting various aspects of pupils' progress (Taneja, 1996:122). The marking can be either subjective or objective. Usually, whether or not the mark given corresponds with the pupil's effort and abilities is debatable because the convert behaviour of pupil's can not be easily accessed and fairly by the techniques teachers use. As a result, there is difficulty in evaluating educational achievements for there are differences among educators or teachers in evaluating

and reporting student's progress, which leads to judging on students. Many of these judgements are difficult and unpleasant experience to make; for instance, giving low grades to students who have not succeeded in the assessment (OEB, 2000:25-27).

2.7 Factors Affecting Active Learning

It is common that like any educational issue in the teaching-learning process, active learning too may come across constraints during its implementation in the real classroom conditions. In general there are two types of constraints. These are: Human related and non human related factors.

2.7.1 Human Related Factors

2.7.1.1 The Training of Teachers

The success of educational process depends to a great extent on the character and ability of teachers. Teaching in the modern school must be vastly enabled to produce better-educated person than was found formerly. Teaching demands the ability to adapt boldly, to invent,and to create procedures to meet the ever changing demands of learning situation in order to enable to develop the continuous imaginative anticipation of mental process of the learner. Teachers must know much more about subject matter, methods of teaching the learner and his growth, the setting for and environment of learning, about the interaction between learner and environment. Therefore, the modern professional teacher must possess a system of principles and habits of thinking which guide the operational process. Scholars have suggested that, if education to be successful, next to curriculum, teacher training is of special significant, which needs consideration so as to maximize the development and changes in education Gerhard, 1982: 21 in DestaAbera M.A Thesis).

Teacher's pedagogical skills can be improved by emphasizing courses that develop the teacher's ability to reason about the content of instruction. Teachers should have a sound knowledge of the curriculum and be able to transfer it to the learners. They must be able to analyze critically the material to the interest and abilities of their students. Teachers must be able to organize and manage the classroom, evaluate discipline, and encourage students in manner that promotes better learning.

2.7.1.2 Teachers Attitudes

Teacher's attitude is the basic ground to act in a positive or negative way towards persons, ideas or events happening in the environment. And most educators are convinced the teacher attitudes are very important dimensions in the teaching process.

Kahan (1988: 2) asserts that students with teachers of positive attitudes towards teaching and the curriculum are found to be high level achievers in learning. And consider the teacher's attitudes as very important aspects in the teaching process and suggested that teachers' attitudes towards the subject taught is one of the common studied teacher characteristics. According to (Cooper, 1986: 6), teacher's attitudes are very important and have the direct effect on our behaviour; they determine how we view our selves and interact with the environment. Therefore, possession of a college degree not in any way ensure that teachers will be effective in their teaching unless and otherwise they have positive attitude to the subject and approaches of teaching.

2.7.1.3 The Role of supervision in facilitating the Implementation of Active learning Approach

Supervision is the service provided for the purpose of improving teaching and learning process. The effectiveness of supervision depends on the skills and competence of supervisors in working with the entire staff, classroom teachers and administrators. Supervision is a cooperative service designed to aid teachers rather than to report teachers (Smith, 1961: 403 in DestaAbera M.A Thesis). Studies support the role supervision carried out by the school principals and supervisors who are mainly responsible to make follow-ups on how the teaching and learning processes takes place in schools. It is important to understand that; supervision is a type of educational service rendered by a variety of school officials, principals, directories and head of departments and general and special supervisors (Monere, 1956: 1371). The scope of goal-centred supervision is indicated by current category of the factors conditioning the growth and achievements of pupils.

a. Factors resident in the pupils themselves internal capacities and past achievement
b. Factors resident in the teacher-personal qualities knowledge of subject matter, skill in teaching and etc.
c. The curriculum its social utility, interest, value, difficulty value and etc.
d. The materials of instruction, textbooks, teacher guides and supported materials.

Good supervision as now conceived are governed by principles such as:-

Based upon practice growing out of judicial blending of science, philosophy and ordinary experience, good supervision is democratic, creative and not prescriptive both in discovery and validation of educational facts and relationship in applying to the specific situation, proceeds by means of an orderly, cooperative planned and executed series of activities, is known by the results of it secures, and good supervision is guided by professional goals and standards (Ibid. 1372).

2.7.1.4 Teachers and principals as supervisors

The implementation of any curriculum demands the cooperative effort of the entire staff. The role of senior staff members and principals are an essential element of supervision activity, because they can give advice to staff about policies, and/or about role of responsibilities. The school teacher and the principals are the most available supervisors for entire professional inter staff development in supporting teachers who are untrained trying new teaching methods, leading staff discussion and so on.

Max as cited in (Dean Jean, 1992: 29) suggests four areas in which he saw himself offering support to teachers:-

1. Support at a basic level in providing practical ideas.
2. Teaching support given in the classroom, through demonstration, general teaching alongside the classroom teachers, team teaching and assisting in debate or dramatization of science.
3. Personal support for teachers, increase their confidence, being personal ambassador for their subjects.
4. Helping teachers to change the way thought sciences.

Supervision in education has to play major role in the staff development of the institutions at every level. The following important roles would be expected from supervision as related to the staff development of an educational organizations or schools.

To improve teachers' class room instruction to provide teacher's with objective feedback on the current state of their instruction, to diagnose and solve instructional problems to develop skill in using instructional strategies to evaluate teachers for promotion, tuner, or other decisions to develop a positive attitude about continuous professional development. (Ibid, 1998: 72-73).

2.7.1.5Interest of Learners

Learners' interest is very decisive in applying any new approach in teaching and learning process.

2.7.2 Non Human Related Factors

2.7.2.1 Class Size

Class size: refers to number of learners regularly scheduled to meet in the administrative and instructional unit, known as class or section, usually under the direct guidance of a single teacher (Monere, 1956:212). Class size concerns educators for various reasons because learning can only occur positively when lessons are under appropriate conditions both for the students and teachers. The classroom size has its own impact in facilitating or hindering activities of teaching and learning.

Silverman (1996:9), points out that the physical environment in a classroom can make or break active learning. Of course, no one set up or class arrangement is ideal; rather there are many options. The interior decorating of active learning is fun and challenging, especially when the furniture is less than the ideal. In some cases, furniture can be easily rearranged to create different set ups. If the furniture is movable, it could be possible to use different layouts for active learning even in the most traditional classroom environments. The same author has suggested ten different types of classroom layouts, which facilitate active learning approach. These layouts include: U shape, team style, conference table, circle, group-on-group, and work station, break out groupings chevron arrangements, traditional classroom and auditorium. Similarly, as AmareAsgedom (1998:294) explains, over-crowdies of classroom is one of the two highly observed critically problems of education of Ethiopia context. This problem has hindered student follow up, student participation, teacher-student communication and feedback in the classroom.

2.7.2.2 Shortage of instructional materials

As explained by Makulel (1998:137), instructional materials are all those materials that the teacher brings in to the classroom from time to time to facilitate his/her teaching to make work more creative and effective. The same author classified instructional materials that help the teacher and students as resourceful devices in the teaching and learning practices in to

three categories: 1) visual aids 2) audio aids and 3) audio-visual aids. He further noticed that instructional materials help the teacher add a new and concrete dimension to classroom teaching. Because, teachers and students dependent on the materials on the textbook and supplementary books can easily lead to stereotype mode of teaching. Thus, introducing teaching aids to the classroom helps to add a new dimension of teaching.

Instructional materials may be commercially available to prepare by students and teachers. In broader terms, the problems of instructional materials may involve a shortage of textbooks, teacher's guide, pedagogical centres, libraries, reference books and so on. The presence or absence of these materials may facilitate or hinder the implementation of active learning in the classroom.

2.8 Attributes of Active learning and Active learners

Bonwell and Einson (1991 cited in Wikipedia, the free Encyclopaedia, 2005) at (htt://courses-science. tau. edu./riodan/active-learning method), mentioned that some of the characteristics of Active learning are: students are involved in more than listening; less emphasis is placed on transmitting information, students are in higher order thinking (analysis, synthesis and evaluation); students are engaged in activities like reading, discussion, writing---; and greater emphasis is placed on students exploration of their own attitudes and values.

2.8.1 Preconditions of Active learning

During Active learning full participation of learners is expected in the teaching-learning process. For this to happen, Bentely and Walts(1995:15) stated that active learning needs; a non-threatening environments, that not discouraging action for effort of the pupil early involvement of pupils in the organization of the learning process since earlier to stamp their own direction on what is taking place, or initiate activities to their needs and influence events so that they feel it has some purpose for them, moreover, it needs teachers and pupils to establish some common goal about how learning is take place; opportunity for learners take decisions about the context of their own learning, continuous assessment and evaluation, which enables them to diagnose their strengths and weakness and take their own steps; and relevance and vocational.

In addition, Comps (1976) stated that the following six characteristics are need for active learning to takes places.

(1) The atmosphere should facilitate the exploration of meaning or learners must feel safe and accepted;

(2) Learners must be given frequent opportunities to comfort new information and experiences in search for meaning, but these opportunities needs to be provided in ways that allow these students to do more than just receive information and they must get a chance to comfort new challenges using their past experiences without the dominance of a teacher;

(3) New meaning should be acquired through a process of personal discovery, and the methods used to encourage such discovery must be highly individualized and adapted to the learners own style and pace of learning.

(4) The role of teachers and students in Active learning classroom;

(5) Active learning strategies that includes:-

A) Wait Time;
B) Students summary of another students' answer;
C) Fish Bowl;
D) Quiz or Text Question construction; and

(6) Assessment Techniques in the Implementation of Active Learning

Assessment refers to the process of collecting, interpreting, and synthesizing information to aid in decision making and it implies more than quantifying test results of pupils (ICDR, 1999: 192-193), or Assessment is collecting information on the progress of students learning using a variety of procedures (e.g. Chick list, formal test, creative writing---). MOE (2004:5).

Moreover, Bound et, al. (1993) argued that accomplishing active learning starts with involving the learners in making decisions about their programs. Thus, we have to reject the talent hunt model of assessment, because, this model according to (Dary, 2004) certify ability that is already there and rank students, but not take a very active role in helping students learning except in the crudest sink or swim motivation. Therefore, in contrast to talent hunt model, active evaluation that focuses on helping students learning or promotes active learning is necessary.

CHAPTER THREE

Research Design and Methodology

Introduction

In order to have a clear concept of the nature of the problem (The implementation of active learning approach in teaching Algebra in secondary schools),descriptive survey with both qualitative and quantitative approaches was employed because it appears suitable for refining the research tools such as questionnaires, interviews and classroom observation. Besides this, in conducting social research, qualitative design is preferred as it explores issues holistically by describing them deeply, comprehensibly and incredible manner (Creswell, 2003).

3.1 Research Design

This study is a descriptive survey design in order to learn the implementation of Active learning approach in teaching Algebra in secondary schools of East Wollegazone, Oromia regional state.

Best and Kahn (2002:107), stated that descriptive survey design is appropriate to collect data from a relatively large sample. This method is more effective to investigate the phenomena in assessing the implementation of Active learning approach in their natural setting because investigating implementation of the active learning approach need relatively large sample of the concerned population.

One of the other reasons for choosing this design is due to its appropriateness to the nature of the topic and to assess experience, performance and need from respondent on the challenges and opportunities that help to assess the implementation of Active learning approach in teaching Algebra.

The other reasons were:-

- This approach allows the researcher to obtain first-hand information from small sample representing large size population, and
- Also enables the researcher to have multiple method of collecting information or data to assess the current implementation of Active learning approach in teaching in secondary schools in the study Area.

3.2 Source of Data

The sources of data for this study were:-

- Secondary school Mathematics teachers and school Principals;
- Educational supervisors of the Woreda secondary schools and
- Secondary school (Grades 9-10) students.

3.2.1 Sample and sampling techniques

The zone has a total of 17 Woredas and these Woredas sub divided in to two upper and lower Clusters by their distance from the capital city of the zone,i.e those near to the centre were called upper and those far from centre were lower, then lower cluster was selected as a sample by using simple random technique, since the researcher found in this sample cluster. Four Weredas were randomly selected, Gida Ayana, Limu, Ebantu, and Harolimu. From a total of thirty (30) secondary schools in a zone eleven (11) of them were found in the selected sample cluster. From these five secondary schools were selected as a sample for the study by using systematic random sampling technique with a total population of 6627 from these 6327 were secondary school (Grades 9-10) students out of these 3393 were males and 2934 were females and 305 of them were selected as a sample of the study by using systematic random method, from these 159 were males and 146 of them were females, the reason of this was to assumemale students give matured information's.240 were mathematics teachers of the schools out these 216 were males and 24 were females, from these, 84 of them were selected as a sample of the study by using stratified sampling technique of these 72 of them were males and 12 of them were females (50% of the total females).30 were school principals out these 22 were males and 8 were females and 29 school supervisors out of these 28 were males and 1 was female. 15 school principals (5 Directors, 5 Vice- Directors and 5 Unit leaders thatare 3 from each school) and 5 school supervisors were selected as a sample of the study by using random and purposive sampling techniques respectively.

3.3.2. Summary of the sample respondents

Four different groups of respondents were participating in this study to diversify the information. Accordingly, 305 students from five sample secondary schools, 84 mathematics teachers from these sample secondary schools, 15 school principals and 5 school supervisors were included. These four groups of participants were explained in the following three tables.

Table1: Sample of students taken for the study

No	School name	Woreda	popⁿ	Sample	Sex		Total
					Male	female	
1.	Limu	Limu	1194	56	29	27	56
2.	Gida Ayana	Gida Ayana	1912	74	39	35	74
3.	Hinde	Ebantu	1512	65	29	36	65
4.	Haro Limu	Harolimu	1462	58	30	28	58
5.	Kelo	Ebantu	547	52	32	20	52
Tot.	5	4	6327	305	159	146	305

Table 1, indicates the sample of students taken for the study. Accordingly, four woredas and five secondary schools were selected as a sample size with the total of 6327 students and 305 students were taken as a sample size from these 159 of were males and 146 were females.

Table2: Sample of mathematics teachers taken for the study

No	School name	Woreda	Popⁿ	Sex		Tot.	Sample taken for the study		
1.	Limu	Limu	50	Male	Fem.		Male.	fem	Tot.
				48	2	50	20	2	22
2.	Gida	Gida	65	55	10	65	15	10	25
3.	Hinde	Ebantu	60	57	3	60	15	-	15
4.	Haro	Haro L.	52	52	-	52	14	-	14
5.	Kelo	Ebantu	13	10	3	13	8		8
Tot.	5	4	240	216	24	240	72	12	84

The above table indicated the sample size of mathematics teachers' taken for the study. From the total of 240 secondary school mathematics teachers, 84 of them were selected as a sample size based on the sampling techniques employed to this study. Out of 84 mathematics teachers' 72 of them were males and 12 of them were females as shown in the table above.

Table: 3 Sample of school principals and supervisors taken for the study

No	School name	Woreda	Sample of Both	Sample taken from principals			Sample taken from supervisors.		
1.	Limu	Limu	4	male	female	total	Male	Female	total
				2	1	3	1	-	1
2.	Gida	Gida A.	4	2	1	3	-	1	1
3.	Hinde	Ebantu	4	3	-	3	1	-	1
4.	Haro	Haro L.	4	2	1	3	1	-	1
5.	Kelo	Ebantu	4	2	1	3	1	-	1
Tot	5	4	20	10	5	15	4	1	5

This table shows the sample size of the schools principals and supervisors taken for the study. Accordingly, 15 school principals or 3 directors, 3 vice-directors and 3 unit leaders were participating in the study.

3.3 Research instruments

The instruments (tools) that used to collecting the necessary data were:

- Questionnaires,
- Interviews and
- Classroom observations**.**

3.3.1 **Questionnaires**

The questionnaires used were both closed and open-ended structured questions .The open-ended questions were used to enable the respondents to express their feelings without restriction and the closed-ended questionnaire was used for respondents to give answer easily. Four types of questionnaires had been prepared by researcher and approved by research supervisor. The first closed- ended part question was prepared for school supervisors who focused on their effort to assist mathematics teachers and make follow up on the implementation of the newly introduced approach and they had been requested to respond by selecting from the given item alternatives. Another two item (or both closed and open-ended)questions were also prepared for students and mathematics teachers and they requested to respond about school suitability, facilities, their training background, how they implementing this approach, the content and organization of the text books and teachers guide, finally closed-ended question was prepared for school principals. These questionnaires were designed to collect data from: Grade (9-10) students, mathematics teachers and secondary School principals and supervisors. Except the questionnaires for students which would be prepared in English language and translated to the regional language Afan Oromo in order to convey information without difficulties, all questionnaires were prepared in English language.

3.3.2 Interviews

Semi-structured types of interviews had been employed in the study to collect data from school supervisors because researcher needs their opinions in case of strengthen the responses on the questionnaire part and unstructured type of interviews was employed to collect information from school principals, since principals manage all the school activity then the researcher wanted their opinions deeply that is why un structured interview was employed for them. During the interview the researcher maintained the data by taking notes manually and one to one or individual interview was conducted to collect data from these respondents. To complete these interviews a total time needed was six hours and seven minutes, because the researcher takes ten to twenty minutes to interview an individual respondent.

3.3.3 Observation in the classrooms

To gather more reliable information, observation in the actual teaching and learning process was used as additional data gathering instrument. Observation check list also employed to collect data. A minimum of one period observation time was taken for collecting information in each sample schools focusing, mainly on Algebra portions, teachers' and students'

interaction, classroom teaching and learning activities and facilities. The classroom observation was structured only for teaching and learning of mathematics class.

3.4 Techniques of Data Analysis

The descriptive survey with both quantitative and qualitative data analysis method was used. The gathered data, were tabulated in to numerical data, and organized as well as interpreted. Based on the type of instruments that were employed and the nature of questionnaires set, the percentage was selected for analysis of data. In order to convey ideas to the reader in a way easily understandable, tables showing, the item alternative responses and respondent's number were converted in to percentage, then qualitatively analyzed and interpreted.

Furthermore, the interviews and classroom observations were analyzed qualitatively to strength the findings. Researcher used sup. 1, sup.2, sup. 3, sup. 4, and sup. 5 codes to analyze the school supervisors' interviews, Where sup. 1 was code given to Gida Ayana supervisor, sup. 2, was to Limu supervisor, sup. 3, was to Hinde supervisor, sup. 4 was to Haro Limu supervisor and sup. 5 was to Kelo codes respectively.

CHAPTER FOUR

PRESENTATION AND ANALYSIS OF DATA

The main objective of this study was to assess the Implementation of Active learning approach in teaching Algebra in secondary Schools of East Wollega Zone, Oromia Regional state. The main focuses were investigating on the school facilities to implement Active learning approach, to Assess the awareness of mathematics teachers and their students on the implementation of the Active learning approach, and to identify the understand of the school principals and supervisors about the implementation of Active learning approach. To this end, the researcher used three main research tools(questionnaire, classroom observation and interviews). The use of different tools helped in triangulating the findings obtained.

4.1Characteristics of the respondents

Different groups of respondents were included in the study to diversify the sources of information. Accordingly, 5 school supervisors, 15 school principals,(5 school directors, 5 Vice-Directors and 5 unit leaders), 84 mathematics teachers' and 305 students were involved in the study from secondary schools of the East Wollega zone, Oromia regional state. There were, (409) sample respondents. The questionnaires were distributed for 409 (100%) sample respondents. Besides to this, school supervisors were also interviewed in order to make detailed the information. However, from the total of 409 (100%) questionnaires were distributed for school supervisors, principals, mathematics teachers and students. 86.6%(354) of questionnaires were filled and retuned correctly and 13.4% (55) of the respondents did not appropriately return the distributed questionnaires. 4.5% (19) of them did not complete the provided questions to them and 8.9% (36) of them did not return the received question papers totally. From the total respondents those filled and retuned the questionnaires the school principals comprise 4.2% (15), school supervisors 1.4% (5), mathematics teachers 23.2% (82) and students comprise 71.2% (252). Furthermore, in order to gets basic information of the school on the implementation of Active learning approach in teaching Algebra classroom observation was conducted by using prepared check lists. So that, the data collected from different groups of respondents through different tools were analyzed and interpreted.

4.2 Awareness of teachers, students, supervisors and principals on Active learning.

The major sources of data for this study were teachers, students, supervisors and principals those actually engaged in the teaching-learning process of the secondary schools. An interpretation and analyzing of the data obtained from each items is presented in detail in the following pages.

Table 1: Students' necessary awareness about Active learning methods

No	Items	Respondents			
		Teachers		Students	
		f	%	f	%
1	Students' necessary awareness about Active learning methods?	82	100	252	100
	High	1	1.2	36	14.3
	Average	62	75.6	155	61.5
	Low	19	23.2	61	24.2

Any planned curriculum or any approach only becomes reality when the teacher's implement it with students' in a real classroom, careful planning and developments are important, but they count nothing unless students and teachers are aware of the product and have skills to implement in the real classroom. Teachers' and students' awareness is key and pre-condition to enable them to know why the approach is valid for enhancing the education of the country. An insight in the facts the use of active learning approach helps students to practice it wisely without hesitation. As data in table 1 indicated that the majority of teachers' and students' respondents, 75.6% and 61.5% of them were agree that the students' awareness about the Active learning approach was "average". Others respondents, 1.2% and 14.3% of both respondents respectively, agree that learners are well awareness about the Active learning approach and its importance. Lastly, 23.2% and 24.2% of them respectively, indicated that learners were poor awareness about Active learning approach. In this case, there may not be

bad expectation to have bad work performance related to implementation of the required approach. Because, when there is good awareness willingness is also good to use it as a primary choice for learning. Besides to this, the researcher asked an open ended question for those low aware learners why this so and they were said that “the school did not tell us the importance and drawback of this approach and the concept is new for us”.

Table 2: Supervisors’ orientation about implementation of Active learning approaches

No	Items	Respondents	
		School supervisors’	
		f	%
1	Supervisors’ had taken orientation about implementation of Active learning approach?	N=5	100
	Yes	5	100
	No	-	-
	Uncertain	-	-

Table 2 shows the responses of supervisors’ whether they had taken an orientation (training courses) about the leading principles of education in the country that is how to implement the Active learning approach in teaching secondary schools. According to the data in table 2, 5 (100%) of the respondents had taken an orientation. From the table, one can conclude that all the secondary school supervisors’ had trained how to implement the new method in teaching and learning. Therefore, the purpose and aims of the Active learning approach is clear for these supervisors’ so that, it is not doubtful that these supervisors’ make necessary effort for better school achievements and assist teachers’ and students’ to implement this new approach.

Table3: Length of orientations given to Supervisors' about implementation of Active learning approach

No	Items	Respondents	
		School supervisors'	
		f	%
1	Length of the orientation given?	N=5	100
	Less than a week	1	20
	One week	1	20
	Two weeks	-	-
	More than two weeks	3	60

As table 3 shows, the majority of the school supervisors' were trained more than two weeks. That means, 60% of them declared that they had taken more than two weeks and an equal number of respondents, 20% of them indicated they taken less than a week and two weeks only. From the table, one can assume that school supervisors' had taken enough orientation/training courses regarding how to implement the Active learning approach in teaching secondary schools of the zone.

Table 4: The extent of mathematics teachers' awareness about Active learning approach

No	Items	Respondents	
		School supervisors	
		f	%
1	Awareness of mathematics teachers'?	N=5	100
	Very well	-	-
	Well	5	100
	Poor	-	-

Planned curriculum become reality when the teacher implement it with students' in a real classroom, careful planning and developments are important but, they count nothing unless, teachers' are aware of the planned and have skills to implement it in their classrooms. Teachers' awareness is a key pre-condition to enable them to know the approach is a valid for enhancing the education of the learners. As data in table 4, indicates that all of the sample respondents, 5 (100%) of them were agree that the teachers' awareness about the active learning approach was "well" and no any sample respondents were respond to the teachers' awareness was "very well" or "poor". This may shows their knowledge toward active learning was positive. The concept was also proved by the researcher classroom observation see Appendix-E.

Table 5: More advice is given to learners about Active learning approach

No	Items	Respondents	
		Principals	
		f	%
1	Learners advice about Active learning approach	N=15	100
	Strongly agree	5	33.3
	Agree	1	6.7
	Undecided	1	6.7
	Disagree	2	13.4
	Strongly disagree	6	40

Table 5 shows, 40% of the sample respondents were indicated that, learners get advice about Active learning approach and, 53.4% of the sample respondents were disagree on the advice given to learners about the implementation of Active learning approach. From the table one can conclude that school principals were give less support to secondary school learners to implement the active learning approach.

Table 6: School principals gave awareness about advantage of active learning approach to learners.

No	Items	Respondents	
		Principals	
		f	%
1	Given awareness and advantage of Active learning approach to learners.	N=15	100
	Strongly agree	-	-
	Agree	7	46.7
	Undecided	-	-
	Disagree	8	53.3
	Strongly disagree	-	-

In table 6, the majority of the respondents were disagree on the awareness given to learners about advantage of implementing Active learning approach. And, some respondents, 46.7% of them agree on the awareness they were given to learners about it. From the table one can conclude that, the school principals did not give enough information about the advantage of Active learning approach to secondary school learners. In table 1, both teachers and students respondents, 75.6% and 61.5% of them were respectively, implied that learners awareness about active learning approach was medium but, even though, this might not be leads to bad conditions, it will need more effort to give students awareness.

4.3 Training of teachers, supervisors and principals on Active learning.

As Keoynes (1983:39 in DestaAbera M.A Thesis) mentioned it, students with teachers' positive attitude towards teaching and the curriculum are found to be high level of achievers in learning. Therefore, no matter how good curriculum materials are developed, and resources are available unless the teachers are with good attitudes for the subjects and the teaching, the methods with their students and the profession teaching will never be successful.

Table 7: Supervisors' levels of training before assigned to schools

No	Items	Respondents	
		School Supervisors'	
		f	%
1	Supervisors' were trained?	N=5	100
	Yes	2	40
	No	3	60
	Uncertain	-	-

Training is an important aspect in developing and increasing the human efficiency in order to attain objectives set. Organizations give pre-service training for their workers to enable them to work without minimum problems. As it was mentioned in table 7, 60% of the respondents engaged in supervisions were assigned without getting training and others, 40% of the people assigned to the school supervisions after they had taken training.

The assignment of people to define job without appropriate training might have its own negative impact in retarding its progress. The position and responsibility of supervisor is multidimensional as mentioned in the paragraph of this subtopic because, it deals in planning and coordinating instructional process. From the table, one can assume that, the majority of the school supervisors' were assigned for the school as a supervision without taking professional training that results in the retardation to employ the required new methods in the secondary schools of the zone.

Table 8: Length of training given to school supervisions

No	Items	Respondents	
		School supervisors'	
		f	%
1	Length of time taken to train supervisors'?	N=2	100
	Few weeks	-	-
	Few months	2	100
	One year	-	-
	More than one years	-	-

In table 8, it was an attempt to show for how long was the duration of training given for supervisors' that were agree on their professional training they had taken on table 7. All of the respondents, 2 (100%) agreed that the duration was very short and it was few months. According to the data on the table almost all the respondents had not taken enough training for an extended period of time. It was understood that training time can be shorten or longer based on the designed objectives. But, it is also essential to consider that, with comparable length of time of the possibility to deal with new ideas, master new findings, to introduce once-self will be greater than in training in shorter time. In addition to this, short training should be continuous to update the supervision with new knowledge and skills of how teachers' implement the Active learning method.

Table 9: Organized professional training for mathematics teachers' how to employ the Active learning approach by supervisors

No	Items	Respondents	
		School supervisors	
		f	%
1	Organized professional training for mathematics teachers'?	N=5	100
	Yes	1	20
	No	3	60
	Uncertain	1	20

Table 9 showed, whether the school supervisors' organized professional training to assist mathematics teachers' to employ the Active learning approach in Algebra classrooms or not. Accordingly, 20% of the respondents were agreed on the idea that given professional training for teachers' and the majority of the respondents, 60% of them did not agree and declared as they organized professional training for them and 20% of them again, did not give any response for the idea. Therefore, from the table we can assume that, the school supervisors' were not assists teachers' to implement the new method and this results impact on implementation of the approach in the secondary schools.

Table 10: Management training was given for school principals before they were assigned to the schools.

No	Items	Respondents	
		School principals	
		f	%
1	Management training was given to principals?	N=15	100
	Strongly agree	3	20
	Agree	1	6.7
	Undecided	3	20
	Disagree	6	40
	Strongly disagree	2	13.3

Table 10 shows, training back ground of school principals. Thus, as it was shown, 40% of them indicated that they were “disagree” about their training, 20% of them were declared “strongly agree” on the train given for them, 6.7% of them declared their opinions as “uncertain” and 13.3% of them were “strongly disagree” on training given for them before they were started administrative activities. The data on the table implies half of the school principals manage the schools without enough training and this might be affects the implementation of the Active learning approach in teaching secondary schools.

4.4 Implementation of Active learning approach.

The implementation of the active learning approach is very important in teaching and learning activities. In order to implement the desired approach: teachers subject skills, facilitating learners in to different group activities, teaching materials and teachers training back grounds are very crucial.

Table 11: Teachers’ have necessary skills to teach Algebra using active methods

No	Items	Respondents	
		Students	
		f	%
1	Teachers' have necessary skills to teach Algebra through active approach?	82	100
	Yes	194	77
	No	50	19.8
	Uncertain	8	3.2

As table 11 indicated that, the majority of the respondents were agree that their teachers have necessary skills and capability of teaching Algebra through Active leaning methods by rating, 77% of them were said "high" and others sample respondents, 19.8% of them said the teachers have no necessary skills to teach Algebra through the desired method. Finally, very few respondents, 3.2% indicated "uncertain". From the table above one can assume that the teachers in the secondary schools have necessary skills and capability of teaching Algebra through active learning methods. Also, the researcher classroom observations proved that teachers have necessary skills to apply the desired approach.

Table 12: Mathematics teacher's facilitates learners to participate in to different group activities during his/her Algebra classroom teaching.

No	Items	Respondents			
		Teachers		Students	
		f	%	f	%
1	Teachers' facilitates learners to participate in different group activities?	82	100	252	100
	Yes	47	57.3	203	80.5
	No	32	39	45	17.9
	Uncertain	3	3.7	4	1.6

In concerns to the significance of Active participatory learning, Chickering et al., (1987, in Bonwell, and Eison, 2003), suggests that students must do more than just listen. They must read, write, discuss in group, and engage in problem solving. Table12 shown that, 57.3% and 80.5% of teachers' and students' respondents indicated that, the teachers' helps learners in the classroom by participating in to different group activities. Group work is a part of collaborative teaching or learning strategies and it is one of the best ways of encouraging active learning by rearranging the learners work together in groups. In contrast to this, 39% and 17.9% of these respondents respectively agrees that mathematics teachers' were not helped learners to participating in different group work activities. Also, insignificant numbers of these respondents did not have any responses for the ideas.

From the table we had seen that, 80.5% of the students' respondents indicated the existence of different participatory activities in their classroom during Algebra classes.

In contrast to this, the researcher made classroom observations during mathematics classroom teaching. The result of this shown, most of mathematics teachers participating learners in to different group activities only sometimes and out of the five classrooms that researcher observed only one class which was frequently used different group activities.

Table 13: Frequency of supervision in the schools

No	Items	Respondents	
		School supervisors'	
		f	%
1	Frequency of Supervision activities in schools?	N=5	100
	Once in a year	-	-
	Twice in a year	-	-
	More than two times in a year	5	100
	When the need arises.	-	-

As, it was pointed out in table 13 that, supervision was made in the secondary schools and number of periods were very important, 100% of the respondents answered that there were supervisions more than two times in a year. Therefore, as we observed from the data the frequency was not limited so as to give professional assistance to teachers, to identify problems encountered by teachers and students implementing the active learning approach in teaching Algebra. To check if the school atmosphere is conductive for realizing the planned activities, supervisors are supposed to see all academic and administrative affairs of the schools. Supervision is a purposeful activity. It requires planned accomplishment rather than spontaneous.

Table 14: Frequency of applying Active learning approach by mathematics teachers

No	Items	Respondents	
		School supervisors	
		f	%
1	Frequency of applying Active learning approach?	N=5	100
	Always	-	-
	Sometimes	5	100
	Not at all	-	-

Table 14 shows the frequency of the mathematics teacher's applying the Active learning approach during his/her teaching classrooms. The total numbers of respondents, 5 (100%) of them were indicated that they were applying sometimes. The environment around the school

and the place in which each student living was a full of problems, which needs attentions to observe, to test and give solutions. Creative teachers' should be concerned about the approach that valid to solve these problems. The supervisors' level of training, interests of learners, scarcity of resources for successful instruction could be some of the reasons for unsuccessful implementation of the Active learning approach in the secondary schools.

Table 15: Numbers of mathematics teachers' employing the Active learning approach in teaching Algebra classrooms

No	Items	Respondents	
		School supervisors	
		f	%
1	How many of the mathematics teachers' implement the Active learning approach?	N=5	100
	All of them	-	-
	Most of them	2	40
	Few of them	3	60
	None of them	-	-

Table 15 shows, 40% of the school supervisors' respondents were said that most of them implement the Active learning approach during their Algebra classroom and the rest sample respondents, or 3 (60%) of them indicated that only few of them were employed the Active learning approach.

In addition to this, the researcher was interested to interview the school supervisors to deal the kinds of active learning approaches that the teachers' were used to implementing the active learning approach in their classrooms. Thus, all of them (sup 1, sup. 2, sup. 3, sup. 4 and sup. 5), were said that "few of them were used group discussion; problem-solving techniques, peer-teaching and brain storming were the methods they applied in their

classroom". Where, sup. 1, sup.2, sup. 3, sup. 4, and sup. 5 were the code that researcher was given to sample interviewed supervisors.

Therefore, from the above table and supervisors interviewed result we can assume that the majority of teachers' did not implemented the Active learning approach in teaching Algebra in secondary schools.

Table 16: A school principal assists mathematics teachers' to implement the Active learning approach

No	Items	Respondents	
		Principals	
		f	%
1	Principals assist mathematics teachers to implement Active learning approach.	N=15	100
	Strongly agree	4	26.7
	Agree	6	40
	Undecided	2	13.3
	Disagree	2	13.3
	Strongly disagree	1	6.7

Table 16 shows, 26.7% of the sample respondents were strongly agrees on the idea that they assists teachers' to implement the new approach, 40% of them also agree on it and the others respondents, 13.3% and 6.7% of them were respectively disagree and strongly disagree on the assistance given to mathematics teachers' to implement the Active learning approach. Finally, 13.3% of the sample respondents were said "undecided". From the table, one can assume that the majority 10 (66.7%) of them assisting teachers' to implement the desired approach and the result implies positive to the ideas.

Table 17: Principals Observations of how active learning approach in teaching Algebra classroom was implemented

No	Items	Respondents	
		School principals	
		f	%
1	Observed how active learning approach in teaching Algebra implemented in classroom.	N=5	100
	Strongly agree	1	6.7
	Agree	9	60
	Undecided	2	13.3
	Disagree	2	13.3
	Strongly disagree	1	6.7

Table 17 shows, principals' supervision of a classroom how mathematics teachers' implemented the active learning approaches in Algebra classroom. Accordingly, 60% of them were agreed that they supervise how it was implemented. Besides, 6.7% of them again, strongly agreed on the idea. And, 13.3% of the sample respondents were disagreed on their observation of how the approach implemented in Algebra class and 6.7% of them again, strongly disagree on it. From the table, the majority of sample principals were positively responded on their observation of the Algebra classroom to follow up how active learning approach was implemented. From this data, we can conclude that most of the secondary schools principals follow up whether the active learning approach was implemented in a classrooms or not.

Table 18: Do teachers act as a facilitators?

No	Items	Respondents

		School principals	
		f	%
1	If your response to question number 6 is agree did they act as facilitators?	N=10	100
	Strongly agree	1	10
	Agree	7	70
	Undecided	-	-
	Disagree	2	20
	Strongly disagree	-	-

From the table, majority of the respondents 8 (80%) of them were agreed that mathematics teacher's act as a facilitator, rather than an actor. And others, 20% of them were disagree that teachers' did not act as a facilitator, rather act as an actor in their classrooms but, this number of respondents relatively insignificant. Therefore, from the table we can conclude that teachers, facilitate learners in participating to different group works and they act as facilitators of their students.

Table 19: Teachers participating learners in to different group activities

No	Items	Respondents	
		School principals	
		f	%
1	Teachers' participating learners in to different group activities.	N=15	100
	Strongly agree	8	53.3
	Agree	4	26.7
	Undecided	3	20
	Disagree	-	-
	Strongly disagree	-	-

In concerns to this, in the related review literature of this study, Chickering et al., (1987, in Bonwell and Eison, 2003), suggests that students must do more than just listen. They must read, write, solve problems and discuss in groups. In table 19, 53.3% of the sample respondents were strongly agreed that teacher's participating learners in to different group activities. And others, 26.7% of them were again, agree that they were participated learners in to different group activities. Finally, 20% of them were undecided their concepts towards this idea. From the table, 80% of the respondents were declared positive ideas toward teachers' participation of their learners in to different group activities. In order to triangulating the concept see table 12 of both teachers' and students' responses on this issue. Accordingly, 57.3% and 80.5% of teachers' and students' respondents respectively, implied teachers' helps learners in the classroom by participating in different group activities.

4.5 Factors influencing the implementation of the Active learning methods.

It is common that like any educational issues in the teaching and learning process, active learning too may come across constrains during its implementation in the real classroom conditions. Some of them as mentioned by sample respondents are; number of learners in the

classroom, lack of instructional materials and interests of learners. This is somewhat positive to implementation of the approach.

Table20: The suitability of the school to implement the Active learning Approach.

No	Items	Respondents			
		Teachers(N=82)		Students(N=252)	
		f	%	f	%
1	School situation and classroom arrangements to implement active learning approach?	82	100	252	100
	High	2	2.4	13	5.1
	Average	38	46.3	102	40.5
	Low	42	51.3	137	54.4
2	Average numberof learners in aclassroom?	82	100	252	100
	30-40	-	-	-	-
	41-50	-	-	4	1.4
	51-60	14	17.1	45	18
	61-70	52	63.4	129	51.2
	Above 70	16	19.5	74	29.4
3	Is there a Library in the school?	82	100	252	100
	Yes	75	91.5	249	98.8
	No	5	6.1	3	1.2
	Uncertain	2	2.4	-	-

As indicated in the table, the majority of respondents, 51.3% and 54.4% of mathematicsteachers' and students respectively suggested that the suitability of the schools to implement the Active learning approach was low. Again, other respondents, 46.3% and 40.5% of them consider the suitability of the school was an average. Both the responses show that the situations are not conductive to learn and to teach using the Active learning approach. Suitability of the school includes availability of the classrooms, furniture's, appropriate number of students at a certain class level, facilities like: Libraries, school pedagogical centres, instructional materials, necessary human resources and so on. The suitability of the school has its own positive or negative impact in the process of realizing educational tasks. Intended objectives can be achieved in the right way whenever there are suitable school conditions. Table20, item2 shows the majority of teachers and students respondents respectively, indicated, 63.4% and 51.2% of them suggested that the number of learners in per classroom wasbetween 61-70. Similarly, 19.5% and 29.4% of the teachers' and students' respondents were respectively suggested that the number of learners in a classroom is averagely above 70 and very few of the teachers' and students respondents were said that the average number of students in one classroom is between fifty one to sixty. Nearly, none of the respondents were said that the number of students in a classroom is between 30-40 and 41- 50. Classrooms are actually designed under specific criteria's in order to accommodate a certain number of teaching and learning processes. There are set rules on how to use a class for effective teaching and learning process. The types and amount of materials to be used and methods to be employed depends up on it. Appropriate classroom size helps in facilitating teaching and learning. Accordingly, table3, item2 more than half of both mathematics teachers' and learners' accommodates an average number of students in per- classroom was between 61-70 and even the next significant respondents indicates that the number of students in per-class is above 70. This item shows the schools are with large class sizes having students between sixty to seventy per-classrooms. In teaching and learning large classes makes oral communication, participating students indifferent group activities and assigning learners in written works difficult. The teachers' can hardly make continuous follow ups of his/her students on how they tackling problems and suggests solutions for the activities given. As mentioned in the literature review part of this study class size is the concern of many educators. (Monere, 1956:212) stated that class size concerns educators for various reasonsbecause learning can only occur positively when lessons are under appropriate conditions both for students and teachers. Physical environment in the classroom can make or

break Active learning approach (Silverman, 1996:9). Again, item3 of the table above indicated that, the availability of the Libraries in each samples school. Accordingly, nearly all of the teachers and students respondents were said there is a library in each of their schools. That is, respectively, 91.5% and 98.8% of mathematics teachers' and students indicated the availability of Library in their schools and insignificant respondents, 3% and 1.2% of teachers' and students respectively, said "No" Library in their schools. One can assume from item3 of table 20 that almost all of the sample schools possess Libraries. To make the information detail the researcher asked whether these Libraries served both the students and teaching staff appropriately and the majority of both teachers and students respondents indicated that the Library served "Twice in a week" and few of these respondents were said that, the available Library served only the working day starting from two hours to eight hours with a limited number of Algebra books and nearly none of these respondents said the present Library serve "Daily(24 hours)".Libraries are resource centres for getting better and new knowledge, experience of another people of the past and current practices. Libraries serve to get many opportunities to see the work of the others and widen the horizon of once own knowledge and understanding. Students can do their best in searching truth and answer for the problems of the study assigned from their teachers. Skills of reading and practicing develop when there is frequent relation of the individual with reading materials available in school Library and if it is also sustainable. The ability of developing of searching new ideas, facts, and solutions, for posted activities will be possible when there are Libraries and reader service to learners at regular base.

Table21: Availability of Instructional materials to implement the Active learning approach in the schools

No	Items	Respondents					
		Teachers (N=82)		Students (N=252)		Supervisors (N=5)	
		f	%	f	%	f	%
1	Instructionalmaterials availability?	82	100	252	100	5	100
	High	2	2.4	5	2	-	-
	Average	29	35.5	94	37.3	1	20
	Low	49	59.7	153	60.7	4	80
	Not at all	2	2.4	-	-	-	-

Table21 shows, 2.4% of the total teachers' respondents, 2% of the total students' respondents and none of the school supervisors' respondents were agree that schools are well equipped with the necessary instructional materials other than text books. And the majority of the respondents, 59.7% of teachers', 60.7% of students and 80% of the school supervisors agree that schools were equipped with "Low" instructional materials while, 35.5% of teachers, 37.3% of students and 20% of the school supervisors were believed that their schools are equipped with "average" instructional materials and finally, 2.4% of the teachers, respondents indicated that the schools are equipped with no necessary instructional materials.

Text books, furniture are most of available materials in the majority of the schools, but there is shortage of supporting materials or teaching aids at the secondary schools. This was observed during the data collection and classroom observation times in these schools. Scarcity of the necessary instructional materials retards the effective implementation of the Active learning approach in teaching Algebra in secondary schools of the country. An active student self-learning through exploring concrete situation and resources is not possible

without having appropriate materials. Instructional materials availability is a major factors either enhance or to harm the whole process of education. With the absence of instructional materials learning tends to memorization rather than to help problem solving. In order to relate lessons in to practice, therefore, efforts to produce or supply instructional materials to schools are remain necessity. It is reasonable to expect the children use the materials and equipment regularly everyday use in the classroom and the greater range of basic source of materials the wide the possible scope of work, which develops the implementation capacity of the learners. Access of instructional materials contributes to facilitate the instructional processes in the schools. It increases students' participation and minimize the burden of teachers' talks and objectives of education can be realized easily with little. It motivates students learning and task accomplishments. To sum up, the schools are running with lower instructional materials either that can be distributed by higher authorities through purchase or be produced in the schools by the respective subject teachers and students.

Table22: Trained school Pedagogical centre coordinators

No	Items	Respondents	
		Teachers(N=82)	
		f	%
1	Coordinators are available for school pedagogical centres.	82	100
	Yes	7	8.5
	No	72	87.8
	Uncertain	3	3.7

Table22 shows that most of the school pedagogical centres do not have specially trained pedagogical coordinators who can plan, produce and enable to disseminate instructional materials. Pedagogical centres are necessary to enable schools to relate lesson to reality or give life to the instructional process. The researcher observation in the sample schools proved that there wereno trained teachers assigned in the schools pedagogical centres and there are

also no pedagogical centres in most of these sample schools. The presence of a pedagogical coordinator and his/her contribution is not only to the production and dissemination of instructional materials, but also, essential to the transfer of skills and technology to the teachers, students and schools to more practical and implementing the Active learning approach in teaching mathematics classroom.

Table23: Services rendered by the school pedagogical centres for implementing the Active learning approach

No	Items	Respondents	
		Teachers(N=82)	
		f	%
1	Does the school pedagogical centre serve all the times?	82	100
	Yes	6	7.3
	No	69	84.1
	Uncertain	7	8.6

As table 23 shows the majority of mathematics teachers' respondents, 84.1% of them implied that the school pedagogical centres do not give service for the school educational activities. Also, few number of respondents or insignificant numbers of respondents agree that the school pedagogical centres serve all the times. Hence, from the table, 84.1% of the respondents agree that the school pedagogical centres do not serve for educational activities and this implies that the contribution of coordinators to the implementation of Active learning approach in teaching Algebra in the secondary schools of the zone is missed.

Table24: Students' interests towards learning mathematics through Active methods

No	Items	Respondents	
		Teachers(N=82)	
		f	%
1	Students interests towards learning Algebra?	82	100
	High	1	1.2
	Average	16	19.5
	Low	65	79.3

According to data on table 24, 79.3% of the total respondents rates students interest to the subject they are teaching is "low". But, others respondents comprising only, 1.2% of them consider that they have high interest. The data on the table is somewhat a positive indicator because only, 19.5% of the respondents replied that the interest of the learners is "average" and this number is insignificant. This data may strike us why the majority of students are not with high interest to the subject, because high interesting leads learners to be more motivated to lessons. The interest to attend a lesson or towards learning Algebra through this method leads to them to be challenge, more aim oriented to learning and school activities. With the increase of students' interest to learning, there is also a comparable increase to implement the new approach to solve the given problems and try to give solutions.

Table25: Teacher interests towards teaching Algebra to implement the Active learning approach

No	Items	Respondents	
		Teachers(N=82)	
		f	%
1	Teacher interests towards teaching Algebra to implement the Active learning approach?	82	100
	High	50	61
	Average	29	35.4
	Low	3	3.6

The interest of learning can occur positively, when both the learners and the teachers are interested in the learning as well as teaching. In table24, we have seen that the majority of teachers' claim that the interest of students is "average" as rated by 79.3% of respondents. In table25, 61% of the respondents are interested in teaching Algebra to implement the new method while others 35.4% are with "average" interests and 3.6% of them said "No" interest of teaching mathematics in general and Algebra in particular to implement the Active learning methods.

The above data given in table8 shows that there is a positive attitude among the majority of the teachers' toward teaching Algebra to implement the new method.

In similar to this, the researcher classroom observations confirms that most of mathematics teachers' are interesting towards teaching mathematics in general and Algebra in particular even though, there are some factors that hindering them to apply their skills properly.

The result of such attitude is therefore; the success to apply the desired approach to implement the Active learning approach.

Table26: Reasons to dislike the teaching mathematics to implement the Active learning methods

No	Items	Respondents	
		Teachers(N=3)	
		f	%
1	Reasons for dislike teaching Algebra portion to implement the Active method?	3	100
	High task load	3	100
	Complexity nature of the subject	-	-
	Low respect of teaching it	-	-
	Bad working conditions	-	-

As it was indicated in table26, mathematics teachers were required to give reason why they have low interest in teaching profession and, 100% of these teachers' responded that "high task load" is the cause of why they dislike. To sum up, teacher's loss of interest to the profession affects badly the teaching- learning process. Therefore, as shown in table6, majority of the respondents indicated that they have high interest towards teaching Algebra to implement the desired method and only 3.6% of them indicated loss of interest towards teaching mathematics in general and Algebra portions in particular and this number is comparatively insignificant.

Table27: Challenges of teaching and learning mathematics through Active method

No	Items	Respondents			
		Teachers		Students	
		f	%	f	%
1	Challenges of teaching and learning Algebra through Active learning?	82	100	252	100
	High	44	53.7	128	50.8
	Average	33	40.2	97	38.5
	Low	5	6.1	27	10.7

Table27shows, how challenges and opportunities of teaching and learning Algebra by using the method of Active participatory, small group discussion, per-teaching and so on. Accordingly, more than half of both respondents agree that teaching and learning of Algebra through Active methods has “high” challenges by rating that 53.7% and 50.8% of mathematics teachers’ and students’ respondents respectively. Others respondents, 40.2% and 38.5% of them indicated that teaching/learning of mathematics in general and Algebra in particular through Active learning method have “average” challenges and opportunities. Finally, relatively very few teachers’ and students’ respondents, 6.1% and 10.7% respectively indicated that teaching and learning of Algebra through active methods need “low” challenges and opportunities.

In supporting the above ideas, the researcher was made classroom observations on the issues of challenges of teaching/learning Algebra through Active learning approach. As the observations result reveal that teachers and learners were frequently faced with different challenges and opportunities during teaching/learning of Algebra portion through Active learning approach.

This is because of many reasons as the researcher observed during data collection and classroom observation times. Some of these reasons were: number of students in the classroom was averagely between 61-70, lack of instructional materials and interests of learners to participate in this approach.

One can assume from the data given in the table above that teaching and learning of Algebra using the active learning method required high challenges in the secondary schools of the zone.

Table28: Mathematics textbooks, and teacher guides were developed with high quality in order to implement the Active learning method.

No	Items	Respondents			
		Teachers		Students	
		f	%	F	%
1	Textbooks and teacher’s guides were developed with high quality?	82	100	252	100
	Yes	59	72	158	62.7
	No	23	28	88	34.9
	Uncertain	-	-	6	2.4

The textbooks suitability as cited in table 28 is prepared at a high quality in order to implement the Active learning method because the majority of teachers' and students respondents, 72% and 62.7% of them respectively, agree that the text books and teacher guides were developed with high quality in order to implement the desired method. Others respondents, 28% and 34.9% of the teachers' and students did not agree on the idea that the text books and the teacher guides were developed with high quality in order to implement the Active learning methods and 2.4% of the learners did not indicated any response to idea and this number is relatively insignificant. Therefore, the text books preparation as mentioned in table 30 is somewhat demanding further improvement because, the chance to review or repeat, checking or re-checking, opportunity to learn at one own rate as mentioned by (Brown, 1980) is possible when they are prepared in the right way.

Table29: Availability of textbooks, teacher guides and different references in the school Library

No	Items	Respondents	
		Students	
		f	%
1	Availability of text books, teacher guides and different references in Library.	82	100
	High	-	-
	Average	96	38.1
	Low	156	61.9
	Not at all	-	-

Table 29 showed that, the availability of instructional materials like; textbooks, teacher guides and different related references in the school Libraries and then, the majority of the sample respondents indicated that the availability of these instructional materials in the school library is "low" by rating that, 61.9% and others respondents, 38.1% of them were said the existence of such materials are "average". Finally, there was no any respondents indicated,

the availability of these instructional materials in the school Library is “high”. Therefore, one can assume from the table that there are Libraries in the secondary schools of the zone, but there was a shortage of textbooks, teacher guides and different references in the available Libraries. The absence of reading materials in the school Library directly affects the learners independent and group work that directly hindering the implementation of Active learning approach in teaching Algebra in secondary schools.

Table30: Major factors influence the implementation of this approach

No	Items	Respondents					
		Teachers		Students		Supervisors	
		f	%	f	%	f	%
1	Factors influencing implementation of Active learning approach?	82	100	252	100	5	100
	Number of learners in class;	23	28.04	67	26.8	2	40
	Lack of resources/materials;	26	31.7	68	27	1	20
	Interests of learners.	22	26.8	67	26.8	1	20
	Others	11	13.4	49	19.5	1	20

As, mentioned in table9 of item2, suitability of the school includes; availability of classrooms, appropriate number of students in a classroom, furniture’s and facilities like; Libraries, school pedagogical centres, instructional materials, necessary human resources and so on. These all mentioned above have its own positive or negative impact on the implementation of active learning approach in teaching Algebra in secondary schools. Regarding to instructional materials Mukalel (1998:37) states instructional materials are all those materials that the teachers’ brings in to the classroom from time to time to facilitate his/her teaching and to make their work more creative and effective. The same author classified an instructional material that helps the teachers and students as resourceful devices in the teaching and learning process as; visual aids, audio aids and audio-visual aids. The interests of learners to learn the desired subject is very crucial to implement any approach in each grade levels.

According to the data on table 30, 86.6% of mathematics teachers', 80.5% of sample students' and 80% of school supervisors' respondents respectively implied that the major factors that mainly influences the implementation of the Active learning approach were:- number of students in a classroom see table9 item2, that the teachers' and students' respondents respectively rated by 63.4% and 51.2% that number of students in a specific classroom was between 61-70 which was very difficult to participate learners in to different small group activities as well as ambiguous to control for classroom teachers'.

Silverman, (1996:9), stated that the physical environment in a learning classroom can make or break active learning approach. The second factor is lack of instructional materials in their schools and the third factor that they indicated was lack of interests of learners to learn Algebra through Active learning methods. And others few respondents, 13.4%, 19.5% and 20% of these three sample teachers', students' and school supervisors' respectively indicated other factors and pointed out that shortage of school economy, monthly salary paid for teachers'and the value that the Government give to education are the major factors that influence the implementation of Active learning approach.

Besides to this, the researcher interested to interview by semi structured interview for school supervisors and unstructured interview for school principals. As they responded that the major factors that influencing the implementation of active learning were three in numbers these are; "numbers of learners in a classroom, lack of materials such as; instructional materials like; text books, teacher guide, Chairs, tables and so on and other materials". Finally, the third was interest of learners towards learning mathematics through active learning approach.

Also, the researcher classroom observation proved that the core factors that affect the implementation of the desired approach in teaching algebra in secondary schools were mainly related to, number of learners in a classroom which was over-crowded and impossible to participating learners in small group activities, and lack of textbooks. That means students taken textbooks by group three and that make learners difficult to do their homework, class work, assignments and group activities and last factor that the researcher observe was learners were less interest to learn Algebra through this method. To know the reason why they dislike the researcher asked an open ended question and most of them implied that "by its nature the subject need more effort, but we have no enough materials and time to practice it". Because, we share our time equally to others subjects. Similarly, some of them again said "the topic is

too complex to understand it". Thus, from table16 and classroom observation checklist, one can conclude that the major factors that influencing the implementation of Active learning approach in teaching secondary schools of the zone were: Large class size, Lack of resources like; teaching aids, textbooks, furniture's, chairs, Desks and different related references in the Libraries and lack of learners interests to learn Algebra using Active learning methods.

Table31: Appropriateness of class size to implement the Active learning approach

No	Items	Respondents	
		School supervisors	
		f	%
1	Appropriateness of class size to implement the Active learning approach?	N=5	100
	Highly appropriate	-	-
	Appropriate	1	20
	Undecided	-	-
	In appropriate	4	80
	Highly in appropriate	-	-

In table31, 80% of the sample respondents were indicated that the class size was inappropriate to implement the active learning approach and others, 20% of the respondents were agrees that the class size was appropriate to implement the active learning approach.

Similar to this, researcher interested to observe Algebra classroom during teaching and learning process. The result of this classroom observation showed that, the class size was not appropriate to implement the active learning approach because, number of students in a classroom was very large, classroom sitting arrangement was not appropriate to apply different group and individual activities.

From the table and researcher classroom observations, we can conclude that the class size was not favourable to implement the Active learning approach in the secondary schools of the zone.

Table32: Attitudinal reactions of mathematics teachers towards implementing the curriculum using Active learning approach

No	Items	Respondents	
		School supervisors	
		f	%
1	Attitudes of mathematics teachers towards the implementation of curriculum using Active learning approach?	N=5	100
	Very high	-	-
	High	3	60
	Medium	2	40
	Low	-	-
	Very low	-	-

As Keoynes (1983:39 in DestaAbera M.A Thesis), mentioned these concepts students with teacher's positive attitude towards teaching the curriculum are found to behigh levels of achievers in learning. No matter, how good curriculum materials are developed and resources are available unless, the teachers are with good attitudes for the subjects they have teaching. As shown in table32, the majority of the respondents (60%) were agrees that mathematics teachers have "high" attitudes towards the implementation of the curriculum using Active learning approach. And others respondents, 40% of them were agree that mathematics teachers have "medium" attitudes towards the implementation of the curriculum using active learning approach. In table32, more than half of the mathematics teachers' respondents (60%

of them) declared that they have “high” interests towards teaching Algebra to employ the Active learning approach. (See Appendix-B).

The researcher interviewed the school supervisors the major factors that affecting the attitudinal reactions of mathematics teachers those teaching mathematics through active learning approach and all of them said that, “there are many factors” but, sup.1, sup.2, and sup. 5 were said that: “amount of salary paid for them, lack of instructional materials such as; text books, teacher guide, and interest of learners in the classroom to learn Algebra through the desired approach de-motivated them”. In contrast to this, sup. 4 said “training background, the value given to teachers by government, economical background are the main factors that affect the attitudinal reaction of teachers in general and mathematics teachers in particular”, and sup. 3 said that “lack of professional workshop given to mathematics teachers is the core factor that hindering the attitudinal reactions of mathematics teachers”.

From these tables and supervisors interviews one can assume that teachers’ have positive attitudinal reactions towards implementation of curriculum using the required approach.

Table33:Availability of resources like: classrooms, textbooks, teacher’s guides and others related materials in the schools

No	Items	Respondents	
		School principals	
		f	%
1	Resources available in the school to implement Active learning approach.	N=15	100
	Strongly agree	2	13.3
	Agree	2	13.3
	Undecided	-	-
	Disagree	10	66.7
	Strongly disagree	1	6.7

The successes or failure of instruction is largely influenced by supported materials. Monhanty (1984) reported that, the teaching-learning process would become good when a number of relevant materials are used. Implementation of any learning/teaching approach cannot be effective unless, supported materials like: textbooks, teacher's guides and reference books are provided.

Textbooks are the most important materials for attending intended objectives. They are used as a means, not ends, by themselves. Textbooks are critical ingredients in learning the intended curriculum. They are media through which teachers' and students' communicate with each other in an effort toward the teaching-learning process. Besides to this, teacher's guides addresses specifically to teachers it describing the system and gives suggestions on how to use (Yalden, 1987). Lockheed (1991:50) also mentioned that teacher's guide also gives information on what to teach and how to teach. Regarding to this, table33 shows, 73.4% of the sample respondents were disagrees on the concept that resources are available appropriately to implement the Active learning approach. And others, 26.6% of them were agreed on the concept and this number was comparatively insignificant.

To triangulate this, see table21 of both teachers, students and supervisors responses on the availability of instructional materials to implement Active learning approach in their schools. Accordingly, 59.7%, 60.7% and 80% of teachers', students' and school supervisors' respondents were said that "the instructional materials like: textbooks, teachers' guide and related materials are low to implement this new approach".

To confirm these ideas, the researcher interviewed school supervisors the available resources other than student text books that facilitate learners to implement the active learning approach. Sup. 1, sup.3, sup. 4, and sup. 5, both said that "there are no sufficient instructional materials in our school to do so". And sup. 2,said that "Iam not volunteer to give any response on this idea" and researcher asked his reason and he was not volunteer. From these four groups of respondents and supervisors interview we can able to conclude that lack of resources was the major factor that hinder the implementation of the Active learning approach in teaching Algebra in secondary schools of the zone.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 SUMMARY

The purpose of the study was, to assess the implementation of active learning approach in teaching Algebra in the secondary schools of East Wollega zone, Oromia regional state. The obtained data from different sources of information were analyzed using percentage and the result of the study revealed the following findings. Majority of the mathematics teachers', students' and supervisors respondents suggested that the schools were large class size having students between 61-70 per-classrooms. 91.5% and 98.8% of mathematics teachers' and students' respondents respectively, indicated the existence of Libraries in the schools. But, these libraries give less service to learners and teaching staff as majority of teachers' and students' respondents were indicated. More than half percent of mathematics teachers', 60% of the students' and 80% of the school supervisors' respondents indicated that the schools were equipped with lower instructional materials. The majority of mathematics teachers' were indicated schools had not trained pedagogical centres coordinators who can plan, produce and enable to disseminate instructional materials and 70% of teachers' respondents indicated that students' interest to learn Algebra through active learning approach is low and also proved during researcher classroom observations. Majority of the teachers' and students' respondents were agreed that teaching and learning Algebra through Active method had high challenges. Majority of teachers and students' respondents were indicated the availability of text books, teacher's guides and different reference books in their school library were low. 86.6% of teachers', 80.5% of students' and 80% of supervisors' were indicated the major factor that mainly influences the implementation of active learning approach are: "number of students' in per-classroom, lack of resources and lack of students' interest to learn Algebra through Active learning approach". Majority of the principals and supervisors' were assigned to the schools without any training and it resulted in the retardation of the required active learning approach. All of the school supervisors' were agree that there were supervision activities in the school more than two times in a year and 100% of them were also agree that mathematics teachers' were well aware about active learning approach. Majority of the school supervisors' were indicated that teachers' had positive attitudes towards the implementation of the curriculum using active learning approach.

5.2 CONCLUSIONS

The implementation of the Active learning approach in teaching Algebra requires different but, inter related human and material resources. Without fulfilment of these essential elements realizing the expected objectives of education is found difficult.

5.2.1 In this study, majority of mathematics teachers', students, school supervisors' and principals' were indicated that the school situations and classroom arrangements were not conductive to implement the active learning approach. Besides to this, researcher classroom observation was also supported this idea. Therefore, the situation and classroom arrangements of the schools negatively impact the implementation of Active learning approach in teaching Algebra in secondary schools of the zone.

5.2.2 According to the data on this study, classrooms are overcrowded accommodating averagely between 61-70 students in per-classrooms. As 63.4% of mathematics teachers', 51.2% of students' and 80% of supervisors' respondents reported that classrooms are not appropriate for teaching and learning. Therefore, from the data it can be arrived at a conclusion that large class size has a strongly affect the implementation of the Active learning approach in teaching Algebra in secondary schools of the zone.

5.2.3 In this study, 59.7% of mathematics teachers', 60.7% of students', 80% of supervisors' and 66.7% of the respondents were agrees on the availability school facilities rated as low and supervisors' interviews also showed that there was shortage of instructional materials in the schools. Therefore, from these groups of respondents it can be arrived at a conclusion that lack of educational resources and pedagogical centres are the major factors that hindering the implementation of Active learning approach in secondary schools of the zone.

5.2.4 From the data it can be arrived at a conclusion that the interest of learners' towards learning Algebra through Active learning approach influenced the implementation of Active learning approach in teaching Algebra in the secondary schools of the zone.

5.2.5 From the finding it can be concluded that lack of training of the school principals, supervisors and awareness of learners' about advantage learning through Active method hindering the implementation of Active learning approach in secondary schools of this zone.

5.2.6 In sum, the findings from the entire investigation revealed that the Active learning approach was not being implemented in most classrooms selected for the study.

5.3 RECOMMENDATIONS

Educational achievements are the outcome of inter woven different factors. It is difficult to realize intended objectives, practice polices and guidelines without considering the various things that could contribute one way or the other for enhancing the education of the learners. In the previous pages of this study, it was attempt to assess the implementation of the Active learning approach in teaching Algebra and influencing factors in our secondary schools. The result of this study, calls on effort to render minimize to if not at all to avoid the problems encountering to practice the guiding principles of our educational system. Therefore, based on the above major findings, the following recommendations have been put forwarded:-

5.3.1 Woreda educational bureau, zone educational bureau and schools should given consideration for school situations and seating arrangements in the classrooms to cater for more participatory teaching and learning activities. School managements and community should see to it that classrooms are furnished with movable and less cumbersome desks. In their free time, mathematics teachers' have to try re-arranging desks and benches to facilitate students' to small group discussions and other active learning approaches.

5.3.2 In order for mathematics teachers' to able to practise Active learning approach in teaching Algebra classrooms, necessary steps should be gradually taken by schools to alleviate constraints that hinder its implementation. Class size was one of the major factors, which were considered as to hinder the implementation of Active learning approach in teaching Algebra in secondary schools. It is important to give attention to the quality of instructions. Quality of instruction should be the focus. The standard of accommodating limited number of students in one classroom may be used as a solution to reduce the problems of the implementation of Active learning approach. Educational planners should consider the importance of having limited number of students' to keep the quality of Education. The regional bureau, governments and community need to see alternative solutions to keep the standard population in the classrooms.

5.3.3 The school conditions related facilities needs to be considered seriously for the effective implementation of Active learning approach. Schools should be allocate a certain amount of budget and should make real presence of resources or instructional materials like: enough text books, teacher guides and related references in the school libraries year after year, step by

step. Concerned bureaus should take in to account budgeting for these materials either governmental or non-governmental bodies should also be involved in assisting schools.

School pedagogical centres should have trained capable and skilled human power that can plan, produce and disseminate low cost instructional materials and technology. At least assigning trained person at each Woreda level would minimize the problems that schools are facing and can enhancing the implementation of Active learning approach in schools in general and secondary schools in particular. Schools should be motivated to allocate reasonable budgets for the pedagogical centres for better practical works to support the instructional process. Besides, there should be an organized structure and skilled human power at region and zone level.

5.3.4 Although from common knowledge and some general awareness students' or learners' seem to know what are bad and good classroom learning practices with regard to Active learning methodology, they still seem to have little awareness about advantage of learning Algebra through Active approach. It is also axiomatic that students' are the most decisive change agents in any major educational innovation. Thus, if Active learning approach is to be practiced and promoted in the Ethiopian education system, the prior focus should be on the interest of learners' themselves. To this end, it is recommended here that due attention should be given to interest of learners' towards learning Algebra through Active learning approaches.

5.3.5 Principals training come first when thinking about school activities of a given society. The policy should adhere to have at least a degree graduated by leadership to assign to the school principals. Especially, directors and vice-directors of the schools in order to minimize these hindering factors of the implementing Active learning approach in the secondary schools of the country. It is also important to refresh both teachers' and principals' through short training to make them more aware and motivate about how to implement the active learning approach in the schools. Also, due attention should be given to learners' by school principals' about importance of Active learning approach.

5.3.6 As this piece of research is only an initial explorative work, the writer would like to suggest that future research should be undertaken with regard to whether and how the Active learning approach is being implemented in different secondary school contexts of Ethiopia.

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APPENDIX-A

Back Ground of Respondents

A. Teachers				Age range of respondents			Qualifications of respondents		
Sample Woreda	Respondents sex			21-30 Years	31-40 years	Above40 years	BA/Bsc BED	MA/MSC MED	Total
	Male	Female	total						
1.Limu	20	2	22	20	2	-	22	-	22
2.Gida Ayana	15	10	25	20	2	3	25	-	25
3.Ebantu	23	-	23	3	18	2	23	-	23
4.Haro .L	14	-	14	7	-	7	14	-	14
Total	72	12	84	50	22	12	82		82

Respondents service years				Weekly loads per teacher in a week				
1-5 years	6-10 years	Years Above 10	Total	15-20 period	21-25 periods	26-30 periods	Above 30 periods	Total Periods
10	41	31	82	62	20	-	-	

B .Students

No	Grade	Sex			Age ranges					
		Male	Female	Total	<18 Years	18-20 years	21-30 years	31-40 years	41-50 years	Above 50 years
1	Limu	29	27	56	5o	6	-	-	-	-
	Ninth	14	13	27	27	-	-	-	-	-
	Tenth	15	14	29	23	6	-	-	-	-
2	Gida Ayana	39	35	74	64	5	5			
	Ninth	19	19	38	40					
	Tenth	20	16	36	24	5	5			
3	Hinde	29	36	65	59	6				
	Ninth	13	16	29	29					
	Tenth	16	20	36	30	6				
4	Haro Limu	30	28	58	51	7				
	Ninth	15	14	29	29					
	Tenth	15	14	29	22	7				
5	Kelo	32	20	52	49	3				
	Ninth	16	10	26	23	3				
	Tenth	16	10	26	26	-				

c. School Supervisors and Principals

No	Respondents by sex				Age of respondents			Educ.back ground		Work Experiencesin years				
	Name Of school	Male	Female	Tot.	Years 21-30	Above 30 years	Tot.	BA/BSC BED	MA/MSC MED	Principals		Supervisors		Tot.
										1-5	Above 5	1-5	Above 5	
1	Limu	3	1	4	2	2	4	3	1	1	2	-	1	4
2	Gida	2	2	4	1	3	4	3	1	1	2	-	1	4
3	Hinde	4	-	4	4	-	4	4	-	-	3	-	1	4
4	Haro L.	4	-	4	2	2	4	4	-	1	2	1	-	4
5	Kelo	4	-	4	2	2	4	4	-	1	2	1	-	4
	5	17	3	20	11	9	20	18	2	4	11	2	3	20

DABALEE-E

YUUNIVARSIITII FINFIINNEETTI KOOLLEEJJII BARNOOTAA FI QO'ANNOO AMALAA

MUUMMEE SAAYINSII UUMAMAA FI BARNOOTA HERREGAA

QO'ANNOO BARNOOTA EEBBIFFAMTOOTAA

FINFIINNEE, ITOOPHIYAA.

GaafannooBarattootaa

Kaayyoongaafannookanaragaaleeqabatamaanbarbaachisoota'anqopheessuun,xiinxalaraawwii barnootaAljeebiraa (Algebra) si'aayinaanbarachuubarattootaakeessattibarataanhaalotakeessattiakka of danda'ugochuufitarkaanfiibarbachisaafudhachuunfurmaatakennuuf.Kanaaf,gaaffileehundaifaa fiamanamummaandeebisa.Gargaarsaa fi deebiiifaakennuukeessaniifgalannikeessanguddaadha.

Baay'eenisingalateeffadha.

Kutaa I odeeffannooWaliigalaa

1. Saala----------
2. Umurii----------
3. Aanaa----------
4. ManaBarumsaa----------
5. Kutaa----------fi daree---------

Kutaa II odeeffannooQorannoowaliinwal-qabatan

Qajeelfama:

Gaaffileearmaangadiitiifdeebiisirriinita'ajettaniiftokkootokkoosanduqaisiniifkennamekeessam allattoo"X"kaa'a.Gaaffileemuraasaafdeebiitokkooolkennuunnidandaa'ama.

A. Gaaffileehaalamanabarrumsaa fi meeshaaleewaliinwal-qabatan.

1. HaalliteessumadareebarnootaHerregaasi'aayinaanbarachuufnimijataa?

Ciminaan ☐ Gadaanaa ☐

Giddugaleessan ☐

2. Dareebarnootakeessankeessabarataangiddu-galeessaanmeeqa?

30-40 ☐

41-50 ☐

51-60 ☐

61-70 ☐

70 ol ☐

3. Mannikitaabaamanabarumsaakeessankeessajiraa?

Eeyyee ☐ Lakkii ☐

3.1 Deebiingaaffii3[ffaa]keessaneeyyeeyoota'eyeroomeeqatoorbeettifayyadamtu?

Toorbeetti al-tokkoGuyyaahundaa ☐ ☐

Toorbeetti al-lama ☐ Kanbiro ☐

B. Gaaffileehaalabarataa fi hubbanoowaliinwal-qabbate

4. Mala si'aayinaanbarachuubarattootaairrattihubannooammamiiqabdu?

Baay'eeGadaanaa ☐ ☐

Giddu-galeessa ☐

5.Meeshaaleenbarbaachisumanabarumsaairraaargattankitaababarataahaalaaggamijira?

Baay'eeGadaanaa ☐ ☐

Giddu-galeessa ☐

6.Cimina mala si’aayinaanbarachuun mala barsiisaagiddu-galeeffatecaalaaqabumannibarumsaakeessanisin gorse beekaa?

EeyyeeTasayyu ☐ ☐

Lakkii ☐

6.1 Deebiingaaffii 6ffaaeeyyeeyoota’eciminniiisaamaali?

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7. FedhiinbarnootaHerreggaabarachuufqabdan?

CimaaGadaana ☐ ☐

Giddu-galeessa ☐

7.1 Deebiingaaffii 7ffaagadaanaayoota’emaaliif?

Uumamumaanbarnootichidadhabbiiguddaawaangaafatuuf ☐

Uumamumaanbarnootichicimaawaanta’eef ☐

Ga’umsadhabuubarsiisaa ☐

Kanbiroo ☐

8. Tattaaffii fi carraanbarnootaAljeebiraa mala si’aayinaanbarachuu?

CimaaGadaana ☐ ☐

Giddu-galeessa ☐

9. Barsiisaankeessan mala si’aayinaanAljeebraabarsiisuufdandeettiifi ga’umsaqabaa?

EeyyeeHinbeekamu ☐ ☐

Lakkii ☐

10. BarsiisaanHerregaakeessanakkaisingareenhirmaattan, gareenibsitan fi rakkoohiiktanyeroobarnootaAljeebiraanimijeessaa?

Eeyyee ☐ Tassayyuu ☐

Lakkii ☐

11.KitaabnibarataabarnootaHerregaa, qajeelchibarsiisaa, mala si'aayinaanbarachuufqulqullinaqabaa?

Eeyyee ☐ Hinbeekamu ☐

Lakkii ☐

12.ArgamnikitaabaAljeebiraa, qajeelchibarsiisaa fi qajeelchoottingaragaraamanadubbisaamanabarumsaakeessanijiraa?

Ciminaan ☐ Gadaanaa ☐

Giddu-galeessa ☐ Hinjiru ☐

13.Rakkooleeciccimoo mala si'aayinaanbarnootaAljeebiraa (Algebra) barachuufdhiibbaataasisanbarreessi?

14.Rakkooleejirajettaniiyaaddankanarmaanolittihinibsamiinyoojiraatanbarreessi? ----------
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