

**IMPLEMENTATION OF LEARNER CENTERED APPROACH IN
CHEMISTRY LESSONS: THE CASE OF PREPARATORY SCHOOLS
OF EAST WOLLEGA ZONE**

**BY
MESTAWOT ATEW**



**A THESIS SUBMITTED TO:
THE DEPARTMENT OF CHEMISTRY
SCHOOL OF APPLIED NATURAL SCIENCE**

**PRESENTED IN PARTIAL FULFILMENT OF THE REQUIREMENT
FOR THE DEGREE OF MASTERS OF SCIENCE IN CHEMISTRY**

**OFFICE OF GRADUATE STUDIES
ADAMA SCIENCE AND TECHNOLOGY UNIVERSITY**

**SEPTEMBER, 2017
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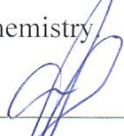
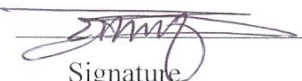
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APPROVAL OF BOARD OF EXAMINERS

We, the undersigned, members of the Board of Examiners of the final open defense by **Mestawot Atew** have read and evaluated his/her thesis entitled “**IMPLEMENTATION OF LEARNER CENTRED APPROACH IN CHEMISTRY LESSONS: The Case Of Preparatory School of East Wollega Zone**” and examined the candidate. This is, therefore, to certify that the thesis has been accepted in partial fulfillment of the requirement of the Degree of masters in chemistry

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I hereby declare that this MSc Thesis is my original work and has not been presented for a degree in any other university, and all sources of material used for this thesis have been duly acknowledged.

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ACRONOMY

ETP- Educational and Training Policy

ICDR: Institute for Curriculum Development Research

ICT- Information and Communication, Technology

LCM-Learner-Centred Method

MOE- Ministry of Education

TGE- Transition Government of Ethiopia

ABSTRACT

The focus of this study was to investigate the degree of implementation of learner-centred approach and the major challenges or constraints which can affect the implementation of learner centred method in chemistry, in selected preparatory schools found in East Wollega Zone. The research design used for this study is descriptive survey and the sampling technique employed for the study is simple random sampling technique for students and available sampling technique for teachers and school administrators. The study used 262 students, 20 teachers and 8 school administrators from four preparatory schools found in three Woreda of East Wollega zone. The collected data were analysed using both quantitative and qualitative techniques. To collect the necessary data for the study questionnaire, interview and focus group discussion were employed as the main data collecting tools. The quantitative data was analysed using mean, standard deviation, one way ANOVA and regression analysis. As the study revealed that the degree of implementation of learner centred approach was low. Most teachers used the lecture method of teaching in chemistry lesson. Some of the challenges inhibit the implementation of this methods are lack of adequate school facilities like presence and implementation of laboratory, library and ICT centres ($\beta=0.715$), curriculum prepared for grade level ($\beta=0.45$), lack of teachers training and awareness ($\beta=0.41$) and class size ($\beta=0.214$) respectively affects more than other factors in chemistry. Finally based on the above findings some recommendations have been recommended.

Key terms-.learner-centred approach, teacher-centred approach, cooperative learning, concept- mapping, direct instruction, indirect instruction

CHAPTER ONE

INTRODUCTION

1.1. Back Ground of the Study

It is an indisputable fact that education plays a vital and decisive role in the overall development of any society. For an education system to be effective, a clear direction, which is compatible with the objective socio-economic realities of a given country need to be devised. Governments and leading parties in all countries, attempt to design relevant educational policies and strategies side by side to other sectors of social development and their means of implementation would generally be based on the need of the individual as well as the society at large (Chauhan, 1996)

Education is a way of developing the desirable habits, skills and attitudes, which makes an individual a good citizen. In the process of education, we try to shape the behaviour of young children in accordance with the aim and goals of the country (Turuallem, 2003). The successful contribution of education to the overall growth of a country strongly depends on its quality (Dejene, *et.al*, 2007).

In Ethiopia, the existing federal government has formulated an educational and training policy. If citizens are contribute efficiently in the overall development of the society, they need to be shaped in such a way that they would have the capacity for problem solving ability to their environment. Thus, it has been stated in education and training policy of Ethiopia that the general objective of is to develop the physical and mental potential and problem solving capacity of the individual (TGE, 1994).

In spite of the above objective stated, the practice to realize the set of goals seems unsatisfactory. The present Ethiopian government also recognizes the inadequacy of educational system to prepare the learner for useful participation in the community. The government thus developed a new education and training policy that states, among other things the education system is entangled in complex problems of relevance, quality, accessibility and equity (Wudu *et. al.*, 2009).

The presence of well-developed educational curriculum, teaching material and organization do not ensure the behavioral change on the part of students unless the necessary attention is given to teaching-learning methods or the process of its implementation. There is no best method of teaching, since students have diversified needs, interests, capacities, and understanding levels. Since there is no single strategy or method is considered best for every subject at all time, it is best to be flexible as well as use a combination of methods. (Kaplan, 1990), asserts further; each subject and grade level has specific teaching-learning method that is determined by the nature of the specific subject matter or discipline, the objective of the lesson, the psychological background of the learner, etc. In order to effect fruitful learning and to achieve the intended learning outcome, educational experts, students, and the school community have to jointly create better teaching-learning atmosphere. Researchers use a variety of classification with respect to teaching-learning method. One of the major educational teaching approach that has become essential component of education and receiving universal importance is learner- centered instruction. Learner centered teaching encourages students to reflect on what they are learning and how they are learning it (Weimer, 2002).

In traditional societies, the aim of teaching-learning was preservation of the accumulated stock of knowledge. But, the main aim of modern teaching-learning is not just the acquisition of knowledge alone. It is the awakening of curiosity, the stimulation of creativity, the development of proper interests, attitude and values and the building of essential skills as independent study (Agrawal, 2004). The Ethiopian Education and Training Policy (1994) also gives emphasis to the improvement of the individuals and society problem solving capacity at all levels. The attention given to the development of problem- solving skills in the education policy of the country is timely and proper since problem solving plays central role in all science and in most other fields. There is also an increasing need to teach improved problem solving skills to students who must be adequately prepared to cope up with a world characterized by growing complexity, rapid change, and vastly expanding knowledge. These scholars explained both intellectual and technological development reveal that the present time is favorable for evaluating the current student centered approach and its relevance to experimental education.

Teachers also have a crucial role to play in nurturing and supporting each child's creative potential, and can contribute to this by exemplifying creativity in their own teaching. The

teacher education institutions also have a key contribution to make in providing teaching staff with the knowledge and competence required for changes, such as the skills needed to promote learner-centred approach, collaborative work methods and the use of modern learning tools, particularly those based on ICT(Wudu et al.,2009).

To improve education, a well-developed teaching methodology of student centered skill is highly required for its importance for students in all fields and professions. To fulfill this, the curriculum should be developed in such a way that instructional methods be aimed at improving problem solving ability (Esen, 2007).

To ensure quality education and promote the new educational policy in line with active learning, the following necessary elements (components) are needed. These are: availability of school facilities, applicable teaching learning methods like problem solving method, project method, inquiry or discovery methods, group work tasks, field trip, experimentation, role plays, dramatizations, reflection, brainstorming (Kaplan, 1990). chemistry as a subject and a field of study must incorporate the above elements to bring behavioral change in learners.

However, it has been observed that there is a problem in the implementation of student centered teaching learning methods in Schools. In our country, the implementation of learner centred approach revealed that teachers doesn't reveal in using this approach. For instance, research documented MOE, (2003) has shown that teachers in Ethiopia were weak at practical teaching using LCM. (Yalew, 2004) reported that teachers be apt to employ frequently the traditional teacher-centred approach of teaching. Similarly, in his study on 'Quality of teaching- learning in Ethiopia primary schools', reported that currently traditional lecture method, in which teachers talk and students listen, dominate most classrooms. The finding of another researcher work by Bedada (2002) revealed that majority of the first cycle primary school teachers apply the lecture method frequently as they haven't been trained in the learner-centred teaching approach. Most teachers use traditional methods of instruction. Because almost every teacher gives a lecture and uses text books as guide to follow. This problem has a negative impact on students' academic performance and established learning. So, the aim of this research is to investigate degree of implementation of learner centered teaching learning methods and challenges in implementation in chemistry lessons the case of selected preparatory schools of grade 11and 12 students in Dire Jato preparatory school, Catholic Kidane Mihirete preparatory

school from Nekemte Town, Sire preparatory school from Sire Woreda and Arjo preparatory school from Arjo Woreda.

1.2 Statement of the Problem

Quality of education determines students' academic performance. That means students academic performance and quality of education go hand-in hand and they depend on each other. Regarding this, Borich, (1988) explain the quality of education is determined by quality of teaching methods which in turn determines students' academic performance. He also argued that quality of instructional materials, effective school management, good learning environment, quality of teachers, home related factors of the students and other conditions contribute much for quality education. Besides parents socio-economic status, the class room teacher is the most influential in student's education and also teachers are the key to educational reform (Moore, 2000).

It has been observed that the poor enrolment of students in chemistry was as a result of the way students back ground was laid. The manner chemistry teachers' present chemistry concept is one of the serious problem for the effective teaching of the subject. (Avwiri, 2011)

Chemistry is a very difficult subject for student especially the pioneer one until they build a better and right understanding of basics and fundamentals, they acquire the skill, to handle the subject very well. (Mustafa and Murset, 2013).

Similar findings were reported by Amesbury (2006), that chemistry is the study of matter. This is often a very challenging subject for students. Concerning this point, different studies demonstrate that concepts in chemistry are very difficult for students to grasp since they involve abstract thinking. To this effect, students in chemistry classroom do not perform to the level they are capable of. One variable that may play a part in the performance is the method teachers used to deliver the content.

To ensure meaningful learning in chemistry lessons , it is essential to follow student centered approach. However, even if student centered teaching approach is very mandatory in teaching chemistry many students, teachers, and other educational professionals fail to implement this approach practically(MOE, 2003). The implementation

of learner-centred approach is by far preferred over the teacher centred approach to produce self-directed and self-initiated learners, and teachers who possess excellent problem solving abilities. Hence, the problem in implementation indicate that, it requires well designed and reinvestigation. The methodology, although widely phrased in all documents associated with the teacher educational reform in Ethiopia, but poorly understood concept in practice (Dejene, *et.al*, 2007).The point being stressed here is that, teachers lack good methodological skill. The researcher is also eager to find out the existing problems and degree of implementation of learner-centred approach in chemistry classroom.

This study, attempts to investigate the degree of implementation of learner- centered approach in selected preparatory schools of East Wollega Zone.

Research Questions

- To what extent are chemistry teachers in preparatory schools of East Wollega Zone implementing the learner-centered approach?
- What teaching techniques are very often employed by chemistry teachers to enhance their studentsacademic performance in the preparatory schools of East Wollega Zone?
- What are the major challenges of chemistry teachers in implementing the learner-centered approach in East Wollega Zone?

1.3. Objectives of the Study

1.3.1 General objective

To investigate the extent (degree) to which student centred teaching approach are applied in teaching chemistry lessons in preparatory schools of East Wollega Zone.

1.3.2 Specific objectives

- Examine the degree to which chemistry teachers implement learner centred approach in preparatory schools of East Wollega Zone

- Find out the teaching technique very often employed by chemistry teachers in the preparatory schools of East Wollega Zone..
- Assess the challenges that chemistry teachers face in the implementation of learner-centered approach in chemistry lessons in the preparatory schools of East Wollega Zone.

1.4 Significance of the Study

It is believed that this research has the following importance and contribution:

- 1) It helps chemistry teachers and students to recognize the challenges that can be faced in implementing learner-centered approach that brings active learning.
- 2) The study will provide valuable information concerning the degree of implementation of learner centred approach
- 3) It also initiates educational professionals, teachers, supervisors, and students to be concerned about the implementation of learner-centered approach and students' academic performance.

1.5 Delimitation of the Study

The study was conducted in East Wollega Zone which is found in West Oromia region. . The study is de limited to four preparatory schools selected from three Woreda found in East Wollega Zone. The stated Woreda or the specific site of the study are; Sibu Sire Woreda, 50km. distance from Nekemte on the way to Addis Ababa, Woreda one in Nekemte town and Jima Arjo Woreda which is located on 48 km. from Nekemte on the way leading to Jima through Bedele. The researcher will attempt to investigate the degree of implementation of learner centred approach. This study is not looking at the implementation of learner centred approach in other subjects.

1.6 Limitation of the Study

There are possible weaknesses being acknowledged in this study. Few respondents didn't return the questionnaire on time. The researcher overcome these limitation by repeatedly asking the respondents.

Another challenge that has been encountered was limited experience of the researcher. However, the researcher overcome these limitations by repeatedly asking guidance from advisors and friends.

1.7 Operational Definition of Terms Used in the Research

Learner-centred approach-a situation in which students are cooperating with the teacher and with the other students on particular learning tasks

Teacher-centred approach-is one where activity in the class is centred on the teacher or teacher is actively involved in teaching while the students are passive listener.

Learner controlled-is a strategy that shift power from the instructor to the learner. Power, or control is atopic often avoided in discussion of instruction

Teacher controlled-exercising teacher authority as class room manager to teach more effectively or control students thought.

Methods-the general principle used by teacher to enable student learning

Techniques-a way of carrying particular task or performance of scientific procedure means efficient way of doing

Strategies- plan or method for achieving a particular goal or the skill of making or carrying out plans to achieve goal. System thought, feeling and action, which are systematically oriented toward attainment of the goal. (Jasmina, 2016).

Advance organizer-a statement made by teachers before a presentation or before having read textual material that provides a structure for new information to be linked to prior knowledge (Arends, 1997).

CHAPTER TWO

REVIEW OF RELATED LITERATURE

This chapter deals with some of the major and relevant information / literatures/on the implementation of learner-centred approach and describes many important issues relative to the success of this practice.

“The more teachers understand about how students learn the more effective they will be in achieving high rates of successful performance in problem solving.” D.S. Mason and D.F. Shell (1997) as cited in Jordan, Joni, (2011).

2.1.Basics of Teaching-Learning and Method

Before explaining teaching method, it is essential to define the word ‘teaching’ itself. Scholars define the term teaching in different ways. A more summarized definition is that, teaching is the process of helping, guiding, directing, motivating and encouraging students to learn the content of the subject under discussion (Borich, 1988). Therefore, to teach means to help students to get knowledge and skill. Moore, (1992) suggest that, teaching is an attempt to assist students in acquiring or changing some skills, knowledge, ideas, attitude or appreciation.

Learning is essentially the process of creating meaning from the real activities of daily life. By embedding subject matter in the ongoing experiences of the learners and by creating opportunities for learners to transfer the subject- matter in the context of real world challenges, hence, knowledge is acquired and learning transfers from the class room to the realm of practice.

Teaching -learning method is the way, style and technique that the teacher uses as a means of imparting resources to his/her students in order to bring behavioral change, (Borich, 1988). This means, teaching - learning method is the tactic and technique through which the teacher share his /her experiences to his/her students so as to enable students bring the expected behavioral changes.

Teaching is an interpersonal interactive activity, typically involving verbal communication, which is undertaken for the purpose of helping one or more students learn or change the ways in which they can or will behave (Tirualem, 2006).

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. Modern/traditional, student-centred/teacher-centred, direct instruction/indirect instruction.

2.2.1 Teacher centered teaching method

This method is sometimes called the traditional method because the teacher takes most of the time given and dominates classroom activities. Moreover, it was assumed that teachers were the only knowledge providers. The students were simply passive listeners. The learners were not given chances of participating in learning (Sotto, 1994). This teaching /learning method hinders learner's creativity, thinking and participation of students. It is highly teacher oriented (Arends, 1994). Good examples of this method are lecture, demonstration and note giving.

Dejene (2007) suggests that teacher-centred approach usually takes the form of 'listen and learn' model. The teacher maximizes delivery of information and control of the class with little or no involvement of students. Some advantages of teacher-centred approach is:-large volume of information is delivered in short period of time, content organization and pacing is totally controlled by the teacher, provides forum for expert experiences and testimony, appropriate for large number of students quick and easily asses methods generally can be employed. On the other hand it has the following limitations: - Knowledge controlled by the instructor, one way communication, not conducive for critical thinking, promote passive learning, and cannot accommodate large number of students.

2.2.2 Student centered teaching method

Learner centred approach broadly encompasses method of teaching that shift the focus of instruction from the teacher to students. In this method, students are given more time to solve basic problems and render the solution. That means, the learners are active enough

to discuss, compare, analyze, draw conclusion, report and research. This doesn't mean that teacher hasn't any role. The teacher

has enormous roles in helping, directing, guiding and motivating the students. Learners' academic performance needs the teachers' support. Examples of student centered teaching-learning methods are role play, dramatization, discussion, experimentation, project approach, pair work, micro teaching, individual presentation, etc.

Amesbury, (2006) suggests that, student centred instruction [SCI] is an instructional approach in which students influence the content, activities, materials, and pace of learning. This learning model places the learner in the centre of the learning processor methods of teaching that shift the focus of instruction from the teacher to the student. The instructor provides students with opportunities to learn independently and from one another.

Aggarwal, (2004). In a modern society knowledge inevitably ceases to be something to be received passively. It is something to be actively discovered. If this is rightly understood it would involve a revolution in traditional education.

The educational reform after the adoption of the educational and training policy in 1994 called for an extensive change. "It emphasizes the development of problem-solving capacity and culture in the content of education, curriculum structure and approach, focusing on the question of scientific knowledge and practicum".

Dejene et al. (2007) learner centered approach promote learning by feeling. In many parts of the world, the result of educational research have been used by many teachers to craft teaching methods that are innovative, interactive, student-driven, and responsive to a variety of learning styles. The student-centered approach requires active participation from teachers and students. The student is considered responsible for his learning and much of the responsibility for learning is put on the students. Some advantages of the learner-centered method are:- High student participation in the learning process, students are owners of knowledge Provides real life connections, enhances critical thinking and learning ability, appropriate for multiple assessment strategies. However, it has a limitation. Such as, more difficult to implement with large number of students, can be more time consuming than lecturing, not effective for all curricula, students may be

resistant to trying new approaches to learning. This idea illustrates that, even if learner-centred approach has a great importance in teaching-learning process it is difficult to implement the methodology if the number of students are above standards, not effective for some topics in the content of instruction, the teacher or students may be resists this approach.

2.2.2.1 Inquiry learning

Inquiry is a difficult word to define; policy makers, educators, and researchers do not have a common definition of inquiry. The National Science Foundation (1996) as cited in (Charles & Holloway, 2015) has defined inquiry instruction as: - the diverse ways in which scientists study the natural world and propose explanations based on the evidence derived from their work .Inquiry also refers to the activities of students in which they developed knowledge and understanding of scientific ideas, as well an understanding of how scientists study the natural world.

Deep understanding of most science concepts comes with inquiry-based learning that requires students to investigate the nature of science. Important process of skills such as recording data, communicating, and measuring can be seen in traditional based instruction: however, the higher level processing skills of redacting , inferring, hypothesizing, experimenting, and identifying and controlling variables can only truly occur through inquiry-based experience.(Mastropieri and Scruggs, 1994).as cited in(Charles & Holloway,2015)

Student centred inquiry could be an effective methodology for learning abstract concepts under the provision that the instruction supplies adequate guidance and incorporates enough instruction so that the students don't feel lost.(Hammett,2005).

2.2.2.2 Discovery learning

Discovery learning is another approach of student- centred method. (Bruner, 1970), the best know advocator of discovery learning, as cited in Kaplan, (1990) is that, education should emphasize the structure of a particular discipline and important cases rather than facts. If instead of just memorizing certain facts, we discover them for ourselves, we will be interested, the information will stay with us always, and most importantly, we will

know how to learn. Discovery learning is the opposite of “Reception” or “being told” or being passive. Discovery learning is commonly equated with inductive learning when the subject proceeds from specific to the general.

Students be taught the structure of academic principles or the major concepts, principles and methods of inquiry. Each field has its own way of thinking and of going about solving problems. Farther, he argues that lessons must be structured so that students can actively use their cognitive abilities to learn new material. This approach is so important for students to understand. . Discovery learning is a potent motivator and more satisfying to the student than other methods of instruction. Practice in discovery learning teaches a student to acquire information and skills through problem solving. Discovery learning then will improve problem solving skill. If a student has discovered some principle, the principle can be readily transferred to new areas. (Kaplan, 1990).

The discovery learning model requires that the students participate in making many decision about what, how, and when learning is to be learned and even play a major role in making much decision. (Tirualet, 2006)

2.2.2.3 The Problem- Solving Approach

Many educators feel that the problem solving approach is one of the most effective of all instructional strategies. It can be used for both group as well as individual learning. It is the most effective approach for teaching higher-level thinking processes, helping students to construct their own knowledge and the social and physical world around them. The essence of problem-based instruction consists of presenting students with authentic and meaningful problem situation that can serve as springboards for investigation and inquiry (Arends, 1997). Problem-solving approach is defined as formulating of previously learned rules to create a solution. It is what happens when routine or automatic responses do not fit the current situation. (Tirualet, 2006)

Problem based learning, as a student-centred instruction attempts to engender active learning by using methods such as cooperative learning, open ended assignments, critical thinking exercises, simulation and problem solving activities. This approach leads to students being more challenge and being given more choice and control over instructional activities, which can enhance intrinsic motivation. It is a strategy in which students

collaboratively solve problems and reflect on their experience. The characteristics of problem based learning can be summarised as:-

Learning driven by challenging, open-ended, ill-defined, and ill-structured problem;
Students generally work in collaborative group; Teachers take on the role as a facilitator of learning (Achuonye, 2010)

In addition to the definition given above for the problem-solving approach it can be defined as a process of producing or closing a perceived problem gap. When a solution is proposed, its effect on reducing the gap can be evaluated and adjustments are made accordingly. It is also believed that problem solving ability is developed by giving individuals frequent opportunities to solve different problems.

2.2.2.4 The Project Method of Instruction

A project is a natural, like learning activity involving the investigation and solving problems by individuals or group of students. Ideally project work should consist of task in which a student sets out to achieve some definite goal of real personal value. It is also the application of knowledge or practical application of research leading to tangible result. It is based on existence of real life problem, which needs a solution (Sunzuma, *et.al*, 2012).

It is best if students formulate their own project plan and then execute and evaluate the whole project. But teachers should help their students in selecting project work planning the project, or in providing related reading materials and so on. It is important for teachers that every student should formulate a project completely on his own; then only approval needed be given by the teacher before the students attempt to do it. To this end definite criteria should be developed by teachers both to guide the students' effort as well as to evaluate and approve project plans before any attempt by the students (Sunzuma, *et.al*, 2012)

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 that are not ordinarily available to the classroom. (Dewey, 1949).

In the student's text book, simple projects are given to allow students stabilize and relate what they have learnt in the class to the real life situation in their locality. The projects will also help students practice simple scientific research methods. Therefore, the teacher is expected to give students the best possible guidance and assistance during the project activities. Students should be asked to write reports for each project activities. A report may contain: The problem (as an introduction) the methods used (interview, observation, library) the information gathered; and the conclusion made by the student with suggested solutions to the problem and /or recommendations.

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 background in a particular area. The merit of peer-teaching is that each group or member benefits from each other's activities, sharing the experience. Peer-teaching can solve the problem of large class size (Dessalegn, 2014).

2.2.2.5 Modelling Method

Modelling method emphasis on using models and modelling instruction. Barker, (2012) States that, the instructional objective of modelling is designed to engage students in understanding the physical world by using models to explain, predict, design, and control physical phenomena. It is very engaging for the students and gives them the confidence and self-esteem. Modelling proved to have a positive gain in Chemistry concepts as well as improved students' attitudes about learning Chemistry misconceptions. Modelling instruction is also a reasonable method economically for any teacher who wants to utilize it in his classroom.

2.2.2.6. Concept Mapping

Concept map or conceptual diagram is student centred, active teaching method. It can encourage student-teacher interaction when they create a map together by discussing. Mustafa and Murset, (2013) Suggests that, concept maps are one of the most important teaching and learning tool that promote meaningful learning in chemistry education. Some

of the benefits and uses of concept mapping are: It helps the student to organize their thought, visualize the relationship between key concepts in a systematic way, reflect on their understanding, etc. There are several benefits and uses of concept mapping for both teachers and students. Such as a method of learning, it helps students in learning chemistry both in classroom and laboratory and allow learners to think deeply about chemistry by helping them in building a better understanding and organize what they learn.

2.2.2.7 Group Discussion

Group discussion is one of the teaching strategies that is ideal for encouraging critical thinking on the part of the learner. It is useful or engaging average and less than average students in the learning process. Group discussion can be organized in the form of large groups, small groups or in pairs. During classroom discussion the teacher is expected to perform a number of moderating functions. Such as, orient students to the objective of the discussion, review or summarizes, alters the flow of information and ideas to that which will be most productive to the goal of the lesson, combines ideas and promotes compromise to arrive at a fine consensus (Turualem, 2003).

2.2.2.8 Cooperative Learning

In recent years, studies involving cooperative learning, one kind of student-centred approach have emerged as an internationally important area of social science. Cooperative learning can be defined as a learning approach in which students help one another on an academic subject, in small mixed groups formed both in class and out of the class environments, which helps individuals gain more self-confidence and develop their communication skills and problem solving and critical thinking abilities, and through which all of the students actively participate in the learning-teaching process. The cooperative leaning method makes a more positive contribution to developing students' academic achievements compared to the traditional (Suleyman, 2011).

2.1.2 Direct instruction and indirect instructional method

2.1.2.1 The direct instruction approach

Among the various methods representing the traditional approach of teaching direct instructional model is the most widely practiced. Research in direct instruction shows that students achieve more in classroom in which their teachers actively teach and actively supervise them than in classroom in which their teachers leave them alone to work on their own for long periods of time (Temechegn, 2001). Direct instruction is synonymous with 'expository teaching' and 'didactic teaching.'

Borich, (1988) defines direct instruction as a 'model of instruction that involves explanation, examples, review, practice and feedback on the context of lecture format.' Direct instruction is a teacher-centred strategy that uses teacher's explanation, modelling, combining with student practice. The concept of 'teacher-centred' however, doesn't imply that students remain passive in direct instruction classroom practice. In addition to demonstrating and explaining the material to be learned effective teacher employs other classroom teaching such as questions, giving practice, as well as feedback in order to induce active student involvement. (Turualet, 2006)

Arends (1997) suggests five phases regarding the general flow of direct instruction lesson, which are; providing the objective, demonstrating or explaining the material to be learned, provide guide practice, checking for students understanding and providing feedback for extended practice and transfer

According to Temechegn, (2001) there are six fundamental practices used in this model: Review, check previous day's work (and re-teach if necessary), Present new content or skill, guide students practice (and check for understanding), feedback and corrective ness (and re-teach if necessary), independent student practice and weekly and monthly review.

From the above modelling, we can see that such sequence of instruction requires importance of the teacher. In light of the above discussion direct instruction model is primarily teacher-centred which utilizes the lecture format and involves large amount of teacher talk, question and answer, review and practice as well as immediate correction of students' errors. (Turualet, 2006)

2.1.2.2 Indirect Instruction Approach

Indirect instruction is one of the methods that fall under progressive approach to teaching. Unlike the direct instruction which have the objective of teaching rules, facts and action sequence, indirect instruction strategies focus on the teaching of concepts, patterns, and abstraction. The term 'indirect' signifies here the idea that the learner acquire a behaviour indirectly by transforming materials in to a behaviour that differ from both the stimulus and previous responses given. Borich (1988) indirect instruction is an approach to teaching and learning which the process of learning is inquiry, the result is discovery and the learning context is a problem. In classroom practice it doesn't seek for one best answer but encourages students to come up with their own varied conclusion, which will eventually lead to student-student or student-teacher discussion. Teachers' assistance is also in this process.

Borich (1988) indirect model is helpful in providing the behaviour of students are most likely to apply when they become adult. Some of these are:- provides a means of organizing content in advance, provide conceptual movement using inductive and deductive methods, uses questions to raise contradictions; this include probing for deeper level responses, extending discussion and passing on responsible to the class, encourage students to use exercises and relevance from their own experience, allows students to evaluate the appropriateness of their own response and then provide guidance as necessary cues, question or hints to call attention to inappropriate responses use discussion to encourage critical thinking.

2.2 Student Motivation

Student Motivation Approach: Researchers are of the opinion that quality teaching is found in the school and it is being carried out by qualified teachers who can motivate students to learn under diverse conditions. Motivation is regarded as one of the qualities of achieving good teaching and learning in schools. Student's motivation to learn can be defined as meaningfulness value, and benefits of academic tasks to the learner regardless of whether or not they are intrinsically interesting. Nwachukwu (2009) states that students are more effective learners if they are intrinsically motivated towards learning than if they are extrinsically motivated. When students are well motivated it makes teaching/learning to be effective. The appropriate motivational techniques should be used to arouse the

interest of students towards chemistry learning. Also, the use of appropriate disciplinary measures by teachers can motivate the students to learn. A teacher should be a good role model for the students to emulate. A keen and competent teacher is always certain of good response. He should be punctual and regular to class so as to encourage the students to learn. A teacher who is always punctual in class will through this action encourage even the most perpetual let comer to keep to time for classes. The teacher should make sure the class is well controlled otherwise teaching will be ineffective. (Avwiri, 2011)

2.3 Matching Curricular Offerings with Levels of Mental Development

The curricular and the level of mental development of the students must be considered for teaching of chemistry to be very effective in our schools. Who to teach and what to teach is very important for teaching in schools, if the teacher is to impact knowledge. (Nwachukwu, 2009), states that knowledge has various levels of obstruction which can be grasped by the child whose mental development is in keeping with the levels of knowledge given them also, the teachers should be concerned about the entering behaviour of the student which is the foundation new knowledge can be built upon. The curriculum should be prepared in such a way that the students could hope to cover it with real understanding. The background and environment of the students should reflect their knowledge development which is very vital for an effective teaching of chemistry. Since any knowledge acquired has levels of obstruction, teachers should know the level of mental development of the students and make sure that his/her teaching technique suits such students level so that they can give feedback. When there is no feedback it means the teaching is not effective. For instance, the teacher cannot teach Gas Law and Gas Equation the combination of Boyle's and Charles's Law to junior secondary school students such topic will be difficult for the student to understand because it is above the level of their mental development. The teachers as experts who have good exposure and experience in chemistry are expected to foster the adjustment of students, matching curricular offerings to levels of mental development, understand students' basic cognitive and social problems, making curricular specifications relevant, and motivate the students to learn the subject. For an effective teaching of chemistry the mental development of the students must suit the activities to be carried out otherwise teaching will be ineffective. The student strength and interest of learning will die off, if the mental development did not suit the level of student (Avwiri, 2011).

2.4 Teacher Opinion about Learner-centred Method

In the teaching of chemistry, teachers are expected to have a good level of competence and mastery of the subject before introducing it in the classroom. This will enhance effective teaching of the subject. Teachers need to develop the interest and attitude of the students with regard to the subject through his/her method of teaching. (Avwiri, 2011).

Bonwell and Eison, (1991) acknowledged that, teachers think that an active learning method is very important in retention and comprehension of the course material and utilize the students data and knowledge base. It gives opportunity to students to provide personal insight and interpretation (develop their own answers). In addition, it allows students to experiment with ideas, to develop concepts and to investigate concepts in to system. Most teachers believe that learner-centred method is very important for students' learning. It gives a chance for students to help each other, gives opportunity to do practical work, to be active participant, and creative. In addition it also helps in increasing students' achievement. (Wudu, 2009).

2.5 Theoretical supports of learner-centred approach

The learner-centred classroom practice has several theoretical and philosophical underpinning to support its advantage and viability. For example psychological constructivism or Piagetian constructivism bases its support for this approach on the following assumptions. The purpose of education is educating the individual child in a fashion that supports the child's interest and needs; the child is the subject of the study, and individual cognitive development is the emphasis; and learning is primarily an individualistic enterprise (Temechehn, 2001).

The current paradigm shift [with respect to teaching and learning approach] in educational system of Ethiopia focus on all levels is the need for shift from teacher-centred, which is backed by objectivism, to student centred i.e. constructivism. Constructivists do not believe in the idea of teaching as transmission of information from teacher to students. They also argued that the mere knowing and understanding of fact cannot be taken as learning, for such kind of knowledge remain inert. Constructivists claim that learning takes place when learners are able to use the knowledge and skill they have constructed in unfamiliar context or in real world of work. To this end, they believe that learners should

learn by doing. Learners should construct knowledge themselves both individually as well as in group.

The instructional theories underlying the forerunning teaching approach was behaviourism and cognitivist. In the past, behaviourism was once the best and dominant theory of classroom instruction though currently considered as traditional. Therefore, for behaviourists to educate people is just to help them to modify their observable behaviour. They also give undue emphasis to the teacher than the learners. They believe that it is the teacher who knows what is important and need to be learned by learners. As a result, behaviourists favour teacher-centred methods such as lecture, demonstration and so on. . (Adula & Kassahun, 2010).

According to Jim (2010), Experience makes it increasingly clear that purely verbal presentations - lecturing at large groups of students who passively expect to absorb ideas that actually demand intense deductive and inductive mental activity coupled with personal experience - leave virtually nothing significant or permanent in the student mind.

2.6 Constraints in Implementing Learner-centred Methodology

Jim, (2010) mentioned obstacles in using learner centred approach learning instructional strategies includes:

Teachers can't cover as much course content in class within the time available admittedly, the use of in class active learning strategies reduces the amount of available lecture time that can be devoted to instructor provided content coverage. Use more time intensively, in class active learning instructional strategies can ensure that students learn important course content through pre-class reading and writing assignments, formative in class quizzes, brief in class activities completed individually, with a partner, or in small groups, classroom examinations, etc..

Devising active learning strategies takes too much pre-class preparation - Though the preparation time needed to create new active learning instructional strategies often will be greater than the preparation time needed to "recycle old lectures."

Large class sizes prevents implementation of active learning strategies - Large class size may restrict the use of certain active learning instructional strategies (e.g., it is difficult to involve all students in class discussion in groups larger than 40) but certainly not all. For

example, dividing large classes into small groups can allow for productive in-class discussion activities.

Most instructors think of themselves as being good lecturers (and, therefore, see no reason to change) - Though many view lecturing as a useful means of transmitting information, attending a lecture does not necessarily give rise to student learning. Evidence of this can be seen clearly in the disparity between what an instructor thinks he or she has taught effectively and the actually proportion of course content his or her students successfully demonstrate they have understood and remember on their examination papers.

A lack of materials or equipment needed to support active learning approaches - The lack of materials or equipment needed to support active learning can be a barrier to the use of some active learning strategies but certainly not all. For example, asking students to summarize in writing the material they have read or to form pairs to evaluate statements or assertions does not require any equipment.

Mathewos, (2016) most secondary school Chemistry lessons are characterized by chalk-and-talk and little practical work. Moreover, most secondary schools have no science laboratories and the few that have them are ill-equipped and poorly maintained, respectively, and materials can also serve as a primary influence on how teachers should teach science practical. In addition to that teachers-related factors that influence practical work in chemistry are teachers' poor knowledge of practical work, full-time occupancy of chemistry teachers by the theoretical classes, absenteeism of the teacher at practical classes, late commencement of teaching practical class; lack of awareness and motivation from school managements and unsafe working environments in the schools. Laboratory-related factors are a lack of separate chemistry laboratory, lack of equipment in the laboratory and too short period allocated for practical work. And also low attitude of students towards practical works in chemistry.

Students resist non lecture approaches because active learning alternatives provide a sharp contrast to the very familiar passive listening role to which they have become accustomed. With explicit instruction in how to actively participate and learn in less traditional modes, students soon come to favour new approaches. An excellent text entitled "Helping Students Learn in a Learner Centred Environment": While trying any new instructional approach will always entail a certain level of risk (for both the instructor and his or her students), it helpful to start by first using low risk active learning instructional approaches.

2.7 Characteristics of good teaching

According to (MOE, 1996) Qualities of good teaching can be summarized as -

A process which creates a positive relationship between teachers and students by sharing knowledge, attitude, and skills. It also characterized by encouraging students, to be active participant in teaching-learning process to bringing behavioural change. It develops self-confidence of teachers and students. Teachers also a good role models by attracting attention of the learners to allow a better understanding.

A good teacher selects a good teaching -learning method to deliver the content of the subject matter beautifully and logically, In fact, there is no one best teaching method in pedagogy. A wise teacher uses the combination of the varieties of the teaching methods. Similarly, learners are the products of the selected teaching - learning methods. If the selected/ teaching or learning method is productive, the learners become fruitful. A good teacher also helps students to explore new idea about their lives, their school work, and their relationship with others and create an environment where students and teachers are partner in learning, sharing ideas openly and communicate honestly with one another. (Joyce, et al., 2009).

As teachers we can't teach our students everything in the given time so we have to train them to teach themselves independently. The students should be encouraged to develop autonomous learning, because, this is the best way for students to dig out problems and find solutions. Student centered method adds spice for learners academic success and performance. They do and perform more and more when they are highly exposed to the real world. Analysis of the literature suggests that students must do more than just listen: they must read, write, discuss, or be engaged in solving problems. (Bonwell and Eison, 1991).

2.8 Mis-conceptions concerning student centred method

The role of the teacher using student centred method is sometimes misunderstood. It would be inaccurate to say that students are simply handed a problem and allowed to use their own method to solve problems. Students cannot discover things unless they have the skills and knowledge. Besides this, every step of the students' performance may require

supportive instruction from the teacher. In addition, even after students are ready for the discovery experience they may need help in formulating questions, or require guidance in some form or another.

2.9 The School Infrastructure

Any school system comprises different elements which are unavoidable or missing for effective learning and teaching process. Among such component of the school that worth to be mentioned are the building with its proper class sites, lab rooms with the necessary equipment's, and chemicals, appropriate ICT centres, library, etc.

These and others unmentioned have their respective prominent roles without which the school system could be maintained and achieve its aim for which it is established. The mal-functioning or absence of any of these elements poses a hurdle on the general functions of the school system in particular in learning and teaching process. As the learning activities realized in class rooms, it is affected by size, design, shape and the way rooms are equipped for the purpose. Concerning this point (Hugh, 1982) stated the following:-

School must provide adequate space and facilities for all the activities which are necessary to meet each pupils changing educational needs. The school building must be constructed and equipped to reflect a homey and intimate atmosphere in which pupils may live and work. Also laboratories are very important educational facilities for varies subjects particularly in teaching chemistry. It is the area where the students perform the practical application of their theoretical knowledge by practicing the performance. Hence, the students develop interest and self-confidence in under taking their studies. Besides this the availability of different models and teaching aids further foster their potential in experimentation, research and innovation in their future carriers. In its real sense the absence of such centre for the process of learning entails students to be detached from practical actives and to remain mere theoreticians and even hating the subjects, and as a consequence becomes incapable to develop their potential and unable to develop self-confidence. For our purposes along with other school facility, that deserve to be mentioned are libraries, and ICT centre. Both are stores of knowledge from which we can derive the information we need. These are centres out of the class room that the

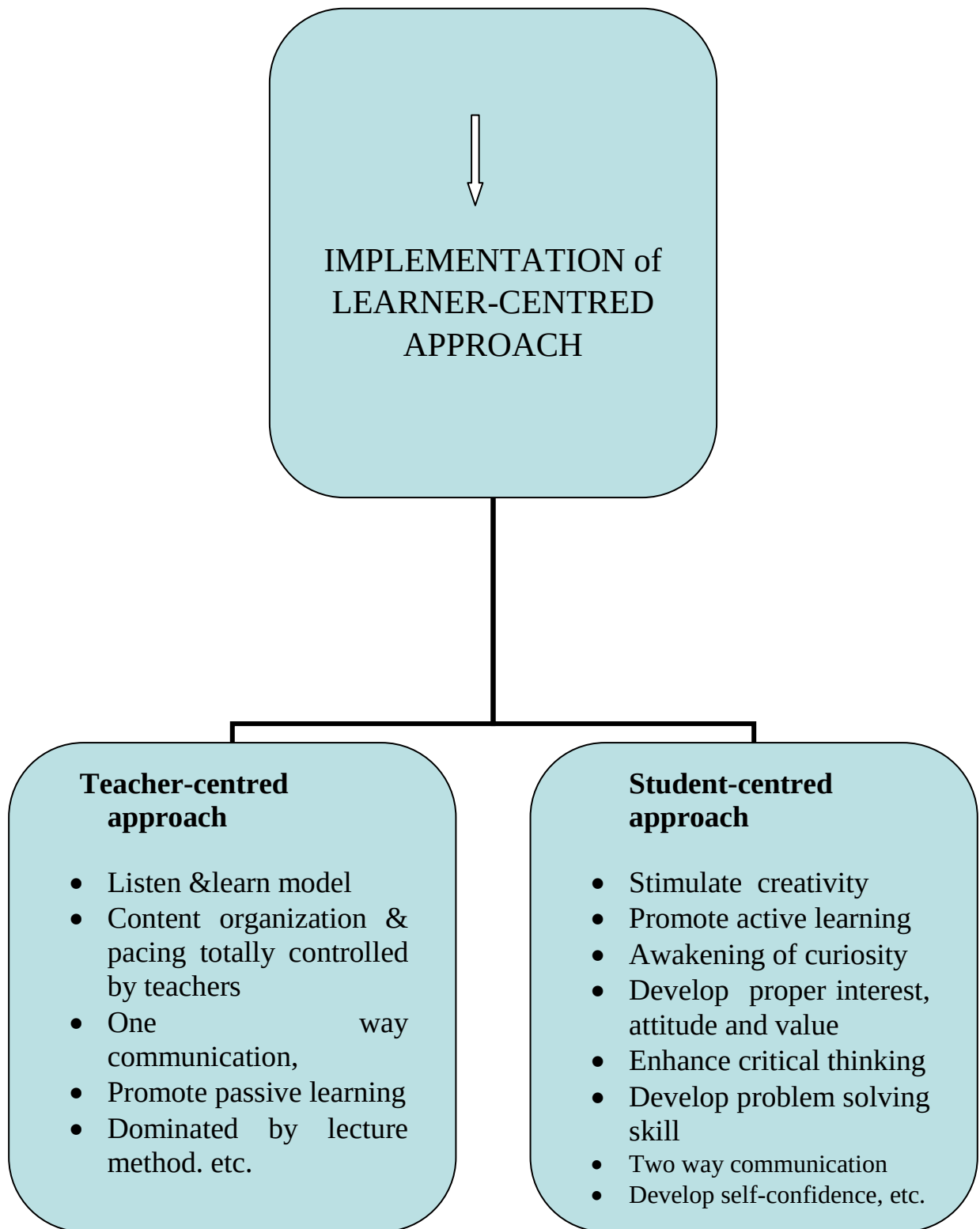
students regularly ought to utilize in order to enrich, and develop their potential and skill of harnessing information they require in their learning.

2.10 Learner Centred 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 or Assessment is collecting information on the progress of students learning using a variety of procedures such as formal test, creative writing, etc. MOE (2004).

Learner-centred assessment practice and procedures improve teaching and learning by enhancing students' performance if principals with representative of the school community design and implements an assessment system that support all student's needs. School staffs, students, and other stakeholders discuss how assessment helps learning and use the information gathered to improve teaching and learning. In learner-centred assessment teachers use multiple assessments according to the guideline, assessment criteria. Assessment tools are culturally and developmentally appropriate and free of bias. Teachers also review and record each student's progress in meeting the curriculum outcome. Grade level teachers meet to discuss the student achievement at the national level, school level, classroom level, and individual level to inform school to make decision. Assessment information is used to evaluate the effectiveness of teacher dedication and accountability. (MOE, 2010)

2.12 Conceptual Framework



Adapted From Agrawal, 2004

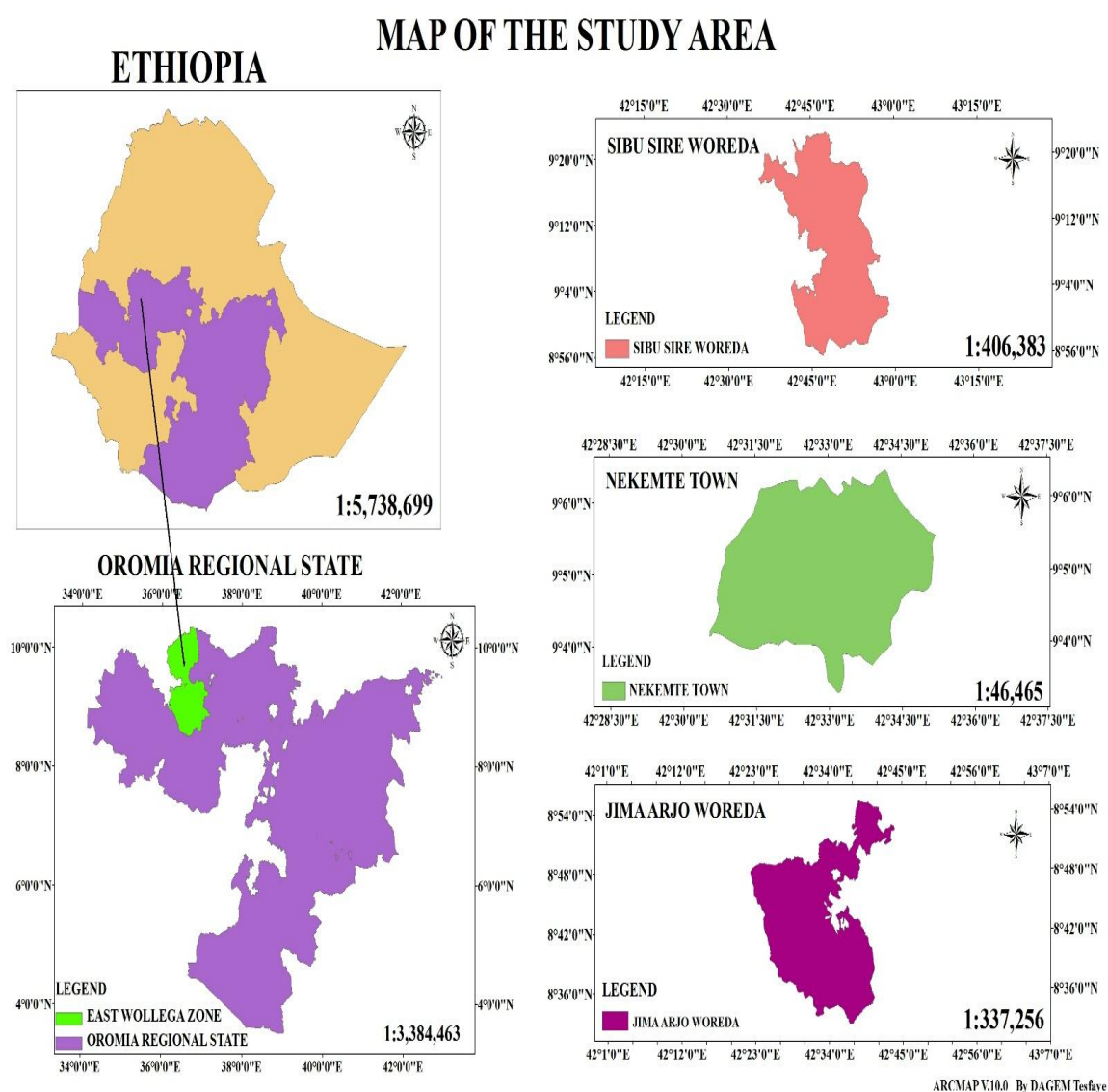
CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Study Area

The study was conducted in East Wollega Zone which is found in West Oromia region. Its capital city Nekemte is located about 300km. away to the west from Addis Ababa. The study is limited to four preparatory schools selected from three Woreda found in East Wollega Zone. The stated Woreda or the specific site of the study are; Sibu Sire Woreda, 50km. distance from Nekemte on the way to Addis Ababa, Woreda one in Nekemte town and Jima Arjo Woreda which is located on 48 km. from Nekemte on the way leading to Jima through Bedele.

FIG. 3. 1 Map of the Study Area



3.2 Research Design

The purpose of this study was to investigate the existing problems in the implementation of learner-centered approach and the degree of implementation in chemistry lessons particularly in Dire Jato , Catholic Kidane Mihirete , Arjo and Sire preparatory schools. So, descriptive survey design was employed. Descriptive survey research aims to describe behaviors and to gather people's perceptions, opinions, attitudes, and beliefs about a current issue in education and answers the question 'what exists'(Roger and Victor,2006).

The method enables the researcher to have access to use multiple instruments for gathering information. It also provides a quantitative or numeric description of trends, attitude or opinions of a population. According to Gay Mills and Airasian (2009), descriptive survey studies are carried out to obtain information about the preference, attitude, practices, concerns or interests of some group of people.

3.3 Data Types and Sources

In order to achieve the objective of the study, sources of data were obtained from primary sources which includes chemistry teachers, students and school administrators So, the total population of the study includes:-

- ✓ 1,345 – Students from Dire Jato, catholic kidane mihirete, Sire and Arjo preparatory Schools.
- ✓ 20 - Teachers from all schools stated above.
- ✓ 8 – School administrators from the above four schools.

3.3 Sampling Techniques

The study was conducted in four preparatory schools found in East Wollega Zone. It includes three governmental school and one non-governmental school. Out of these Dire Jato preparatory and Catholic Kidane Mihirete preparatory Schools are from Nekemte, Sire preparatory School is from Sibu Sire Woreda and Arjo preparatory school is from Jima Arjo Woreda.

There exist different sampling techniques. For this study simple random sampling technique was selected for students and availability sampling technique was selected for teachers and school administrators. Accordingly 20 teachers and 8 school administrators were selected from four preparatory schools stated above. Concerning students, a sample of 20% was selected from the total population. The sample size out of the given population is 269 students were selected and filled the questionnaires in addition, 6 students and 4 teachers were selected for focus group discussion. Totally a sample of 307 respondents were selected.

3.4 Instruments of Data Collection

The study employed a number of data collection instruments used to obtain descriptive information on the implementation of learner centred approach. These are:-

1. **Questionnaire-** questionnaire is considered as the heart of a survey because large samples could be included to obtain reliable results. In addition collecting data through questionnaire is relatively economical. Therefore, the major purpose of the questionnaire was to assess the implementation of learner-centred approach in chemistry lessons in Dire Jato preparatory, Catholic kidane mihirete preparatory, Arjo preparatory and Sire preparatory schools. The questionnaires include both open-ended and close-ended questions. The close-ended types were prepared in the form of five Likert scale measurements (strongly agree, agree, neutral, disagree and strongly disagree). But, the open ended were in the form of that the respondents could give their additional suggestions, feeling, perception and intentions related to the issue. Before the final preparation of the questionnaire each item was tried in the pilot test.

2. **Interview:** - interview permits greater depth of response, which is not possible through any other means. It is a potential means of pure information transfer if the interviewer does his job well (establishes rapport, ask questions in an acceptable manner, etc.), and the respondent is sincere and well-motivated (Morrison, 2007). The purpose of the interview was to collect more opinion that is supplementary so as to substantiate and triangulate questionnaire responses. The appropriate interview which had a relation with the study were prepared and the necessary answers were given by the concerned individuals.

3. **Focus group discussion-**This data collecting instrument is intended to meet the research objective in natural setting. It is a process by which the researcher learn about the

view, behaviour, and habits of the study participants by actually being with them in the natural setting. The focus group discussion was held with a group of participants in order to extract the data on the exercise of learner-centred approach from the students and teachers. The responses were collected using short notes. Finally the discussion were summarized and analysed.

3.5 Procedures of Data Collection

Both the questionnaire and interview were prepared based on the basic research questions and review of related literature .Before administering the questionnaire to respondents', a pilot test was conducted in Dire Jato secondary school which is out of the sampled school and excluded during the actual data collection and improvement and modification were made depending on the comments collected during the try out. At last, the questionnaire was set in its final form. Then, questionnaires were distributed to respondents after a brief orientation about the purpose of the study was given to them. Respondents took the questionnaire to their home and finally, the filled questionnaires were collected from the respondents with the help of assistant data collector.

To get the desired information the researcher discussed with the respondents of the interview to arrange a suitable time and place so that they may be at ease during the interview period. Knowing some of the daily routine of the interviewees is essential.

3.6 Method of Data Analysis

The data were analysed more of quantitatively and triangulated by qualitatively based on the responses collected through questionnaire. The quantitative data collected through close-ended items were tallied and filled in to SPSS version 20 and interpretation was made with the help of percentage, mean, standard deviation and one way ANOVA. The percentage was used to analysed the back ground information, whereas the mean and standard deviation are derived from the data as they serve as the basis for interpretation of the data as well as to summarize the data in simple and understandable way. The interpretation was made for all five point Likert scale measurements (strongly agree, agree, neutral, disagree, and strongly disagree)

After having collected the necessary data by questionnaire, interview, focus group discussion the researcher had analysed the data using percentage and other statistical methods. The data could be illustrated by table, charts and graphs.

The study had used a mixed method approach that focused on collecting, analysing and combining quantitative and qualitative data to explain the result. Data which collected from teachers, students and principals included focus group discussion, interview and open ended questionnaires were analysed qualitatively. The qualitative analysis was done as follows. First, organizing and noting down the necessary information obtained through interview, focus group discussion and open-ended questionnaire items of the different categories were made to assess the variables with reference to the basic research questions. Then transcribing and coding the data to make the analysis easy. Close ended questionnaires were analysed quantitatively.

3.7 Validity and Reliability

Checking the validity and reliability of data collecting instruments before providing to the actual study subject is the core of assure the quality of data. To insure content validity of instruments, initially the instrument was prepared by the researcher and developed under close guidance of advisors, who were involved in providing their inputs for validity of instruments. Hence, the construction of items also checked by English teachers. Moreover, the questionnaire were pilot tested at Dire Jato secondary School by test retest method. The percentage agreement between two was calculated to check the reliability of them; and it was found that about 81.3% which indicate good correlation between them.

3.8 Ethical Consideration

In order to collect data successfully and smoothly, the researcher has asked permission from school principals, voluntary consent of the participants and the researcher created a healthy rapport with respondent expressing that their response are decisive for the successful accomplishment of the study.

CHAPTER FOUR

PRESENTATION AND ANALYSIS of DATA

This part of the research report deals with the presentation, analysis and interpretation of data collected on the implementation of learner-centred approach in chemistry lessons in selected preparatory schools of East Wollega Zone. It contains two major parts; the first part presents the general characteristics of the respondents and the second part deals with the result of findings from the data gathered through the questionnaire, interview and focus group discussion based on evidence. Here the main research questions are answered based on the collected data. For the sake of clarity of information graphs and tables support some of the findings of the study.

General Characteristics of the Respondents

TABLE 4. 1: Participants Number by Woredas and Schools

			Questionnaire		Interview	Focus group discussion
Zone	Woreda	School	Students	Teachers	School administrators	Students & teaches
East Wollega	Nekemte	Dire Jato	30	4	2	6
		Catholic	62	5	2	4
	Sibu-Sire	Sire	60	5	2	-
		Arjo	110	6	2	-
Total	3	4	262	20	8	10

As it is depicted in table 4.1: 262 students and 20 teachers were selected and filled the questionnaire, 8 principals interviewed and one focus group was carried with 10 members were taken as a sample of the study. In each Woreda sample schools were chosen; that is two schools from Nekemte, one school from Sire Woreda and one school from Jima Arjo Woreda were taken. So, a total of four schools were chosen as a sample. Generally as Table 4.1 shows that from the total 262 students which selected in responding the questionnaire, 92 students (35.1%) were from Nekemte, 60 students (22.9%) were from Sibu Sire and 110 students (41.98%) from Jima Arjo Woreda.

TABLE 4. 2: Sex, Status of the Respondent Students, Teachers and Principals

Name of the schools	Questionnaire				Interview		Focus group discussion	
	Students		Teachers		School principals		Teachers & students	
	Male	Female	Male	Females	Male	Female	Male	Female
Nekemte Catholic Kidane-mihiret	32	30	5	-	2	-	4	-
Dire Jato prep.	17	13	3	1	2	-	4	2
Arjo prep.	73	37	5	1	2	-	-	-
Sire prep.	37	23	5	-	2	-	-	-

4.1 Presentation and Discussion of Data from Students Questionnaire

One of the major tool employed in this study was students' questionnaire. The main purpose for devising this tool was to generate information from students regarding the classroom practices as well as major challenges in implementation of learner-centred approach in chemistry lesson. The first part illustrates that the degree of implementation of learner centred approach.

TABLE 4. 3: The Degree of Implementation of Learner-centred Approach in Chemistry Lesson

No	Item	OP	AL	US	ST	RAR	NEV	TOT	M	SD
1	Teachers create a learning environment by organizing different activities for group discussion	F %	14 5.3	26 9.9	83 31.7	101 38.5	38 14.5	262 100	3.47	1.03
2	Teachers facilitate the teaching-learning process by adjusting enough time for practical activities and participation	F %	11 4.2	50 19.1	50 19.1	78 29.8	73 27.9	262 100	3.58	1.20
3	Teachers using different models, charts and diagrams to support the instruction.	F %	9 3.4	23 8.8	71 27.1	58 22.1	101 38.5	262 100	3.84	1.13
4	Teachers encourage students to take responsibilities for their own learning	F %	54 20.6	59 22.5	56 21.4	45 17.2	48 18.3	262 100	2.90	1.39
5	Teachers give a project work individually or in group to initiate learning by doing	F %	17 6.5	23 8.8	49 18.7	52 19.8	121 46.2	262 100	3.90	1.25
6	Teachers using role model to initiate students participation	F %	64 24.4	56 21.4	55 21.0	47 17.9	40 15.3	262 100	2.78	1.39
7	Teachers Helping students in doing experiments during lab. Session	F %	7 2.7	8 3.1	6 2.3	33 12.6	208 79.4	262 100	4.63	0.88

Key: AL = Always, US=Usually, ST=Sometimes, RAR=Rarely, NEV=Never, F=Frequency, M=Mean, SD=Standard deviation

To explore the above idea in selected schools seven items were given to students to answer on five scale: where 1-always, 2-usually, 3-sometimes, 4- rarely and 5-never and the rating scales were ≤ 1.5 =very high, 1.6-2.5=high, 2.6-3.5=moderate, 3.6-4.5=low, >4.5 .

As illustrated in the above table the respondents were asked to judge the degree of implementation of learner-centred method in chemistry lesson. So, the first questionnaire item under this part stated as the degree of implementation of group discussion in chemistry lesson to facilitate active learning, out of the given respondents 14 (5.3%) responding always, 26 (9.9%) responding usually, 83 (31.7%) responding sometimes, 101 (38.5%) responding rarely and 38(14.5%) responding never. From this data it is possible to conclude that 84.8% of the respondents answered some times, rarely and never. This indicates that the degree of implementation of group discussion by facilitating a participatory teaching-learning environment is low. The next questionnaire item (2) stated as, controlling different activities such as different practical activities and participation of students, 11 (4.2%) responding always, 50 (19.1%) usually, 50 (19.1%) some times, 78 (29.8%) rarely and 73 (27.9%) responding never. As the data revealed that, majority (76.8%) of the respondents agreed that, the role of chemistry teachers in facilitating active learning through student participation is low.

The next questionnaire item (3) stated as ‘How often teachers using different models, charts and graphs in chemistry lesson.’ concerning this point 9(3.4%) responding always, 23(8.8%) responding usually, 71(27.1%) responding sometimes, 58(22.1%) responding rarely and 101(38.5%) responding never. The data clearly shows that, even if so many concepts in chemistry lessons are abstract, teachers practically didn’t use this method or techniques to bring meaning full learning. As we observed from data, 101 of the respondents answered never. The result contrary to (Mustafa and Murset, 2013). Suggests that, concept mapping is one of the most important teaching and learning tool that promote meaningful learning in chemistry education.

Questionnaire item (4) stated as ‘Teachers role in encouraging and supporting students to take responsibility for their own learning’ concerning 54 (20.6%) responding always, 59(22.5%) responding usually, 56 (21.4%) responding sometimes, 45 (17.2%) responding rarely and 48(18.3%) responding never. Majority of the respondents agreed that teachers supports and encourages their students in taking responsibility for their own learning. Questionnaire item (5) stated as, ‘How often teachers gives a project work in chemistry

lesson individually or in group to encourage learning by doing.’ Concerning this point out of the given sample, 17(6.5%) responding always, 23(8.8%) replied usually, 49(18.7%) responding sometimes, 52(19.8%) responding rarely and 121(46.2%) responding never. As observed from data, majority (173) of the respondents replied rarely and never even if this method is very important in chemistry lesson to increase students’ activity. Questionnaire item (6) stated as, ‘How often chemistry teachers use role models to initiate students’ 64(24.4%) responding always, 56(21.4) said usually, 55(21.0) replied sometimes, 47(17.9%) said rarely and 40(15.3%). The result indicates that, majority of the respondents agreed that teachers used the method.

Questionnaire item (7) as illustrated in above chart, ‘How often teachers encourage and helping students in doing practical work during laboratory session.’ Concerning this point 7(2.7%) responding always, 8 (3.1%) responding usually, 6 (2.3%) responding some times 33(12.6%) responding rarely and 208 (79.4%) replied never. The result clearly indicates that, almost 92% of the respondents replied rarely and never. This implies that the degree of implementation of experimental activities is very low in chemistry lessons. The statistical result revealed that especially laboratory activities in all sampled school $M=4.6$ & $SD=0.88$, another activities which hindered the degree of implementation of learner-centred method is that the techniques in using models, charts & diagrams $M= 3.84$ & $SD=1.13$, facilitating project work $M=3.9$ & $SD=1.25$ & facilitating different activities to increase students participation $M=3.58$ & $SD=1.20$ mostly affect this method. The result coincides with Amesbury (2006), which revealed that students in chemistry lesson don’t perform to the level they are capable. One variable is that the methods teachers used to deliver the content.

TABLE 4. 4: Techniques and Strategies used by Chemistry Teachers to enhance their Students' Academic Performance

No	Item	OP	SA	AG	NEU	DA	SDA	TOT	M	SD
8	Chemistry teachers are committed in facilitating cooperative learning	F	39	52	28	78	65	262	3.30	1.41
		%	14.9	18.4	9.9	29.8	24.8	100		
9	Teachers are motivate students before delivering the lesson	F	60	84	23	62	33	262	2.71	1.37
		%	22.9	32.1	8.8	23.7	12.6	100		
10	Teachers are guiding and supporting students in doing activities by giving clear direction	F	36	57	31	92	46	262	3.20	1.28
		%	13.7	21.8	11.8	35.1	17.6	100		
11	Teachers are Facilitating group discussion to improve active learning	F	27	45	38	104	48	262	3.39	1.25
		%	10.3	17.2	14.5	39.7	18.3	100		
12	Teachers are committed in using different methods of teaching during chemistry lesson	F	41	47	27	80	67	262	3.32	1.43
		%	15.6	17.9	10.3	30.5	25.6	100		
13	Teachers encourage students in participation in teaching learning process	F	46	49	37	82	48	262	3.14	1.38
		%	17.6	18.7	14.1	31.3	18.3	100		
14	Teachers supporting each students when they are doing exercises by giving feedback	F	53	77	33	59	40	262	2.83	1.38
		%	20.2	29.4	12.6	22.5	15.3	100		

Key: OP=Option, F=Frequency, SA=strongly agree, AG=Agree, NEU=Neutral, DA=Disagree, SDA=strongly disagree, M=Mean, SD=Standard deviation

To explore the above idea in selected schools seven items were given to students to answer on five scale: where 1-strongly agree, 2-agree, 3-neutral, 4- disagree and 5-strongly disagree

This part focused on techniques and strategies used by chemistry teachers to enhance students' academic performance. The first questionnaire item (8) stated as the activity of

teachers in coordinating cooperative learning to facilitate active learning, 39 (14.9%) responding strongly agree, 52 (19.8%) replied agree, 28 (10.7%) said neutral, 78 (29.8%) said disagree and 65 (24.8%) replied strongly disagree. The result indicates that only

34.7% of the respondents have agreed with the idea, the rest or majority of the respondents replied that teachers didn't facilitate cooperative learning during chemistry lessons. The next item (9) stated as the intention of chemistry teachers motivate and initiate students' before delivering the instruction. Therefore, 60 (22.9%) responding strongly agree, 84 (32.1%) agree, 23 (8.8. %) Neutral, 62 (23.7%) disagree and 33 (12.6%) responding strongly disagree. As the data implied that majority of the respondents agreed that teachers initiate and motivate their students before delivering the instruction. The next questionnaire item (10) stated that, teachers helping and supporting students by giving clear and specific direction for activities so, respondents replied that 36 (13.7%) strongly agree, 57 (21.8%) agree, 31 (11.8%) neutral, 92 (35.1%) disagree and 46 (17.6%) strongly disagree the result revealed that majority of the respondents agreed that, teachers didn't implement this technique in chemistry lesson. Concerning item (11), the role of teachers in facilitating group discussion to improve students participation, 27 (10.3%) strongly agree, 45 (17.2%) responding agree, 38 (14.5%) neutral, 104 (39.7%) disagree and 48 (18.3%) strongly disagree. Majority of the respondents agreed that, practically this method is not implemented as expected.

The next questionnaire item (12) stated that, using different teaching methods in chemistry classroom, 41 (15.6%) of the respondents said strongly agree, 47 (17.9%) responding agree 27 (10.3%) neutral, 80 (30.5%) responding disagree and 67 (25.6%) strongly disagree. As observed from the data majority of the respondents agreed that teachers didn't use different teaching methods in chemistry lesson. The next item (13) is the role of teachers in encouraging practice and participation of students in doing different activities. Respondents replied that 46 (17.6%) strongly agree, 49 (18.7%) responding agree, 37 (14.1%) neutral, 82 (31.3%) disagree and 48 (18.3%) strongly disagree. From the data majority of them agreed that teachers didn't create a situation for their students' participation in teaching learning process as expected. The next questionnaire item (14) concerning the role of teachers in supporting students in giving feedback 53 (20.2%) strongly agree, 77 (29.4%) agree, 33 (12.6%) neutral, 59 (22.5%) disagree and 40 (15.3%) strongly disagree. The result indicates that, majority of the respondents agreed that

teachers did this activity in chemistry lessons. The result coincide with (Yalew, 2004) reported that teachers be apt to employ frequently the traditional teacher-centred approach of teaching. From this and statistical data, it can be concluded that most of the time teachers didn't implement those activities and methods of teaching which foster learner centred approach in chemistry lessons.

TABLE 4. 5: Students Response about Major Challenges in Implementing Learner-centred Approach.

No	Item	OP	SA	AG	NEU	DA	SDA	TOT	M	SD
15	School environment and the class size is conducive for learner centred approach	F	29	52	25	93	63	262	3.42	1.33
		%	11.1	19.8	9.5	35.5	24.0	100		
16	Teachers are interested and committed in implementing active learning in chemistry	F	51	54	23	65	69	262	3.18	1.50
		%	19.5	20.6	8.8	24.8	26.3	100		
17	School principals are interested in facilitating LCM to improve students' academic performance	F	36	77	47	67	35	262	2.95	1.28
		%	13.7	29.4	17.9	25.6	13.4	100		
18	Students are interested in doing group work rather than individual work	F	30	64	28	86	54	262	3.27	1.33
		%	11.5	24.4	10.7	32.8	20.6	100		
19	Students are interested in learning chemistry	F	104	70	14	47	27	262	2.32	1.41
		%	39.7	26.7	5.3	17.9	10.3	100		
20	Laboratory, library& ICT centres are available and the school community utilize the resource effectively	F	33	58	23	76	72	262	3.37	1.41
		%	12.6	22.1	8.8	29.0	27.5	100		

Key-SA=strongly agree, AG=Agree, NEU=Neutral, DA=Disagree, SDA=strongly disagree, TOT=Total, OP=Option, F=Frequency, M=Mean, SD= Standard deviation

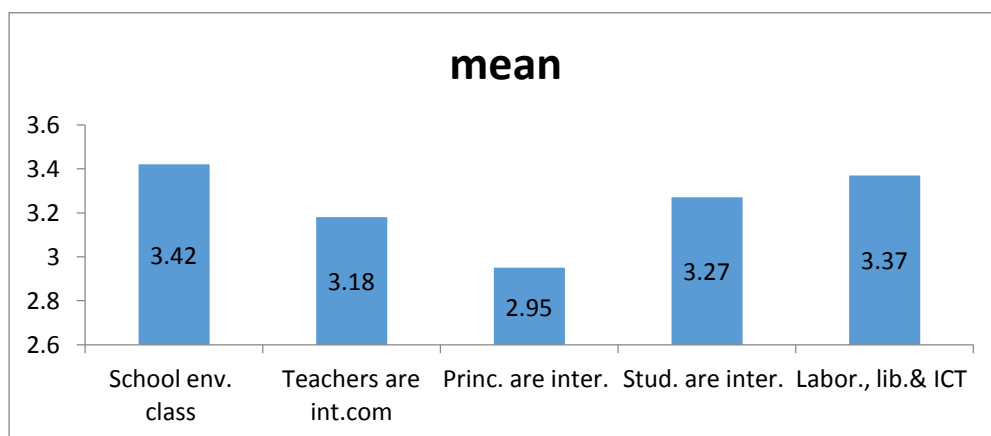


FIG 4. 1: Students Response Concerning Major Factors Affecting Learner Centred Approach

Mean value rating scales were ≤ 1.5 =very high, 1.6-2.5=high, 2.6-3.5=moderate, 3.6-4.5=low, >4.5 very low

In this part the major challenges of chemistry teachers in implementing learner- centred approach in chemistry lesson could be analysed, so it describes to what extent the school environment, teacher's attitude, students attitude, willingness of the school administrators' and the presence and effective utilization of library, ICT centres and laboratory could affect the implementation of learner-centred approach in selected preparatory schools.

As table-4:5 illustrates that, concerning the first questionnaire item (15) stated as, the school environment and class size are conducive for implementation of learner-centred approach. 29 (11.1%) responding strongly agree, 52 (19.8%) replied agree, 25 (9.5%) responding neutral, 93 (35.5%) said disagree and 63 (24.0%) responding strongly disagree. Majority of the respondents agreed the absence of conducive school environment. The next questionnaire item (16) stated as teachers are interested and committed in implementing active learning is that, 51 (19.5%) responding strongly agree, 54 (20.6%) replied agree, 23 (8.8) said neutral, 65 (24.8%) responding disagree and 69 (26.3%) said strongly disagree. The result indicates that majority of them disagree. From the questionnaire and interview confirmed that they do have positive attitude towards learner centred method but they lack in practical implementation. The result coincides with Wudu, et al. (2009).

Questionnaire item (17) stated as attitudes of school administrators towards learner-centred approach in facilitating school environment 36 (13.7) strongly agree, 77 (29.4%)

responding agree, 47 (17.9%) neutral, 67 (25.6%) disagree, 35 (13.4%) strongly disagree. The result shows that almost school administrators have positive attitude toward learner centred approach. However, as confirmed from interview they do have positive attitude toward learner-centred approach but lack continuous follow up in order to be practically implemented. The next questionnaire item (18) stated as students are interested in group work rather than individual work, 30 (11.5%) replied strongly agree, 64 (24.4%) responding agree, 28 (10.7%) said neutral, 86 (32.8%) replied disagree, 54 (20.6%) strongly disagree. The result indicates that majority of students were not interested in group work. The next questionnaire item (19) stated as students interest towards chemistry lesson. 104 (39.7%) replied strongly agree, 70 (26.7%) of the respondents said agree, 14 (5.3%) replied neutral, 47 (17.9%) responding disagree, and 27 (10.3%) strongly disagree. The data revealed that majority of respondents agreed that they have interested in learning chemistry. The next questionnaire item (20) stated as the presence and utilization of laboratory, library and ICT centres in the sampled schools; 33 (12.6%) responding strongly agree, 58 (22.1%) replied agree, 23 (8.8%) said neutral, 76 (29.0%) replied disagree and 72 (27.5%) responding strongly disagree. The result indicates that majority of the respondents replied that the above stated school infrastructures were not present or functional as expected.

On the other hand the result from interview confirmed that, library, laboratory and ICT centres are present in Catholic Kidane-mihiret and Sire preparatory schools. However, the practical implementation was poor even if available rooms are presents for this purpose. Practically there were no enough reference books, computers, chemicals and lab technicians to implement lab. activities and other active learning methods which promote learner centred method. As observed from statistical value concerning school facilities $M=3.42$ & $SD=1.33$, the presence and practical implementation of laboratory, library and ICT centres, $M=3.37$ & $SD=1.41$ and teachers commitment in implementing learner centred approach $M=3.18$ & $SD=1.50$. Respectively hindered the implementation of active learning. The result coincide with (Mathewos, 2016) - The lack of materials or equipment needed to support active learning can be a barrier to the use of some active learning strategies but certainly not all.

Table 4. 6 ANOVA SUMMARY OF DIFFERENCES IN FACTORS AMONG TEACHERS AND STUDENTS RESPONSE

ANOVA					
SUM(tetranaw + teinte + scfac + diratt + chemdif + libiab + texbopre) (FILTER)					
	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	107.317	6	17.886	1.881	.160
Within Groups	123.633	13	9.510		
Total	230.950	19			

As illustrated in the above table, if any difference in between variables, statically significant, one way ANOVA analysis was conducted at 95% confidence interval using SPSS version 20. To check mean difference between groups, the result indicates that, 95% confidence interval ($F = 1.88$, $\text{sig} = 0.16$) it can be concluded that the difference between mean values of variables from students response and teachers response concerning major challenging factors were insignificant. Because the value of $\text{sig. } F > 0.05$.

4.2 Presentation and Discussion of Data from Teachers Questionnaires

One of the major tools employed in this study was a teacher's questionnaire. The main purpose for devising this tool was to generate information from teachers with regarding to the degree of implementation of learner centred approach, methods and techniques used by chemistry teachers and challenges in implementation of learner-centred approach. The first part discussed about the degree of implementation of LCM, the second part discussed about methods & techniques used by chemistry teachers, part III of the questionnaire stated or discussed about major challenges such as teachers training, teachers commitment, school environment and class size, school administrators attitude concerning the implementation of learner-centred approach, students interest in learning chemistry, the presence and practical implementation of laboratory, library and ICT centres including the curriculum prepared for grade level.

TABLE 4. 7 :Teachers Response Concerning Degree of Implementation of Learner Centred Approach

No	Item		AL	US	ST	RAR	NEV	TOT	M	SD
1	Teachers are facilitating a learning environment by organizing a group discussion	F	-	2	6	10	2	20	3.60	0.82
		%	-	10	30	50	10	100		
2	Teachers facilitate the teaching-learning process by adjusting time for practical activities and participation	F	1	3	3	7	6	20	3.70	1.21
		%	5	15	15	35	30	100		
3	Teachers prepare their lesson plan that address the targeted performance objectives & emphasize on students activity, problem solving skill	F	6	5	4	5	-	20	2.40	1.18
		%	30	25	20	25	-	100		
4	Teachers using resource materials like models, charts and diagrams to bring meaningful learning	F	2	4	3	9	2	20	3.25	1.29
		%	10	20	15	45	10	100		
5	Teachers gives a project work individually or in group to initiate learning by doing	F	-	1	3	8	8	20	4.15	0.87
		%	-	5	15	40	40	100		
6	Teachers use teaching aids and other supportive materials to improve teaching and learning process	F	-	-	4	12	4	20	4.00	0.64
		%	-	-	20	60	20	100		
7	Teachers Helping their students when they are doing exercises and gives feedback	F	-	5	8	5	2	20	2.80	0.95
		%	-	25	40	25	10	100		
8	Teachers helping their students in doing experimental work during laboratory session	F	-	1	3	6	10	20	4.25	0.91
		%	-	5	15	30	50	100		

Key: AL=Always, US=Usually, ST=Sometimes, RAR=Rarely, NEV=Never, F=Frequency, M=Mean, SD=Standard deviation

As illustrated in the above table, this part discussed about how often chemistry teachers implement learner-centred approach in chemistry lesson.

Questionnaire item (1) stated as ‘How often chemistry teachers arrange group discussion in order to facilitate active learning, for this activity 10% of the respondents replied

usually. 30% replied sometimes, 50% responding rarely and 10% replied never. The result shows that, majority of the respondents replied sometimes, rarely and never. This indicates that most of the time students are not actively participate in group work as expected. The next questionnaire item (2) stated as, 'How often teachers arrange time for students to practice and participation.' Concerning this point 5% replied always, 15% said usually, 15% replied some times, 35% said rarely and 30% said never. This data also indicates that almost majority of the respondents agreed that time arrangement for students' participation is low. The students didn't get enough time to practice and participate in teaching learning process. The next questionnaire item (3) stated as preparation of the lesson plan in accordance with the need of students, 30% said always, 25% replied usually, 20% said sometimes, and 25% said rarely. The result indicates, majority of the respondents agreed that teachers prepared their lesson plan.

Questionnaire item (4) stated as, 'How often teachers uses different models, charts and diagrams in chemistry lesson.' Concerning this idea 10% of the respondents replied always, 20% of the respondents said usually, 15% of the respondents said sometimes, 45% of them said rarely and 10% said never. So from the data we conclude that teachers didn't use this method most of the time in order to bring meaningful learning.

Regarding item (5) stated as, 'How often teachers give a project work for students individually/in group.' From the total sample 5% replied usually, 15% replied sometimes 40% responding rarely and 40% said never. Such result indicates that majority of the respondents answered sometimes, rarely and never. This reveal that teachers in the study didn't used this method most of the time. The next questionnaire item (6) stated as, 'How often teachers uses teaching aids and other supportive materials to initiate their students.' Concerning this idea 20% of them said some times, 60% of them answered rarely and 20% of them said never. This data shows that, majority of the respondents didn't use teaching aids most of the time to encourage or motivate students.

Questionnaire item (7) stated as, 'How often teachers control their students in doing exercises and gives feedback.' Concerning this point 10% of the respondents said always, 25%of them replied usually, 40% of the respondents said sometimes, 25% of them replied rarely. As the result indicates that, majority of the respondents answered that the degree of implementation of this technique was medium. Questionnaire item (8) stated as, 'How often teachers support students in doing experiments during laboratory session.'

Concerning this idea 5% of the respondents said usually, 15% said sometimes, 30% of the respondents said rarely, 50% of them replied never. The result indicates that the degree of implementation of practical activities were low. The result coincides with Mathewos, (2016) most secondary school Chemistry lessons are characterized by chalk-and-talk and little practical work. Moreover, most secondary schools have no science laboratories

TABLE 4. 8: Teachers Response Concerning Techniques and Strategies Used by Chemistry Teachers to Enhance Students Academic Performance

No	Item		SA	AG	NEU	DA	SDA	TOT	M	SD
9	Teachers are committed in coordinating several learning activities such as cooperative learning to increase student interest and motivation	F	1	2	3	10	4	20	3.70	1.08
		%	5	10	15	50	20	100		
10	Teachers guide students by giving a clear and specific direction for different activities	F	4	7	4	4	1	20	2.55	1.19
		%	20	35	20	20	5	100		
11	Teachers using instructional strategies that are provides students with tasks that require problem solving skills and practical activities	F	3	3	-	8	6	20	3.55	1.46
		%	15	15	-	40	30	100		
12	Teachers identifies the need of students and provide individual support in chemistry lesson	F	3	4	-	7	6	20	3.45	1.50
		%	15	20	-	35	30	100		
13	Teachers facilitate inquiry learning during chemistry lesson to increase students' participation.	F	2	4	2	6	6	20	3.50	1.39
		%	10	20	10	30	30	100		
14	Teachers utilize d/t kinds and procedure of assessments and mechanisms of feedback to enhance students achievement	F	6	8	1	3	2	20	3.6	1.42
		%	30	40	5	15	10	100		

Key- SA= strongly agree, AG=agree, NEU=neutral, DA=disagree, SDA=strongly disagree
TOT=total, F=frequency, M=Mean, SD=Standard deviation

As shown in the above table questionnaire item (9) stated as teachers' commitment in coordinating several learning activities in chemistry lesson, 5% responding strongly agree, 10% responding agree, 15% neutral, 50% disagree and 20% strongly disagree. The result indicates that majority of the respondents were disagree. The next item (10) stated as guiding students by giving clear directions 20% replied strongly agree, 35% responding agree, 20% responding neutral, 20% said disagree and 5% replied strongly disagree. The data illustrates that majority of the respondents agreed that teachers uses this techniques in chemistry classroom. Questionnaire item (11) stated as time allocation for theory and practical activities 15% responding strongly agree, 15% replied agree, 40% responding disagree and 30% responding strongly disagree. The data shows that majority of the respondents agreed that lack of practical activities. The next item (12) stated as giving individual support for students 15% responding strongly agree, 20% replied agree, 35% responding disagree and 30% responding strongly disagree. The result indicates that majority of the respondents replied that this technique was not implemented as expected.

Questionnaire item (13) stated as facilitating inquiry learning to increase students participation in teaching learning process, out of the respondents 10 % said strongly agree, 20% replied agree, 10% said neutral, 30% said disagree and 30% said strongly disagree. The result shows that majority of the respondents disagreed concerning this idea. The last questionnaire item (14) under the role of teachers in chemistry classroom is that using different kinds of assessments and feedback to improve students' academic performance. So, 30% of the respondents replied strongly agree, 40% said agree, 5% replied neutral, 15% said disagree and 10% said strongly disagree. The result indicates that majority of the respondents agreed that teachers used this technique.

Table 4. 9 TEACHERS RESPONSE CONCERNING THE MAJOR CHALLENGES IN IMPLEMENTATION OF LEARNER CENTRED APPROACH

No	Item	OP	SA	AG	NEU	DA	SDA	TOT	M	SD
15	Teachers have enough training and awareness in facilitating active learning in chemistry lesson.	F	1	4	2	9	4	20	3.55	1.19
		%	5	20	10	45	20	100		
16	Teachers are interested and committed in implementing learner centred approach	F	4	4	4	5	3	20	2.95	1.39
		%	20	20	20	25	15	100		
17	School environment and class size is conducive for the implementation of LCM	F	-	3	2	9	6	20	3.90	1.02
		%	-	15	10	45	30	100		
18	School administrators provides necessary support and encouraging teachers towards the implementation of LCM	F	-	9	3	5	3	20	3.10	1.16
		%	-	45	15	25	15	100		
19	Students are considered chemistry is a difficult subject .	F	3	3	1	10	3	20	3.35	1.34
		%	15	15	5	50	15	100		
20	Library, laboratory and ICT centres are available & it is practically applicable	F	1	2	1	8	8	20	4.00	1.17
		%	5	10	5	40	40	100		
21	The curriculum Prepared for grade level is conducive for learner centred learning	F	2	6	1	8	3	20	3.20	1.32
		%	10	30	5	40	15	100		

Key-SA=strongly agree, AG=Agree, NEU=Neutral, DA=Disagree, SDA=strongly disagree, TOT=Total, LCM=Learner-centred method, F=Frequency

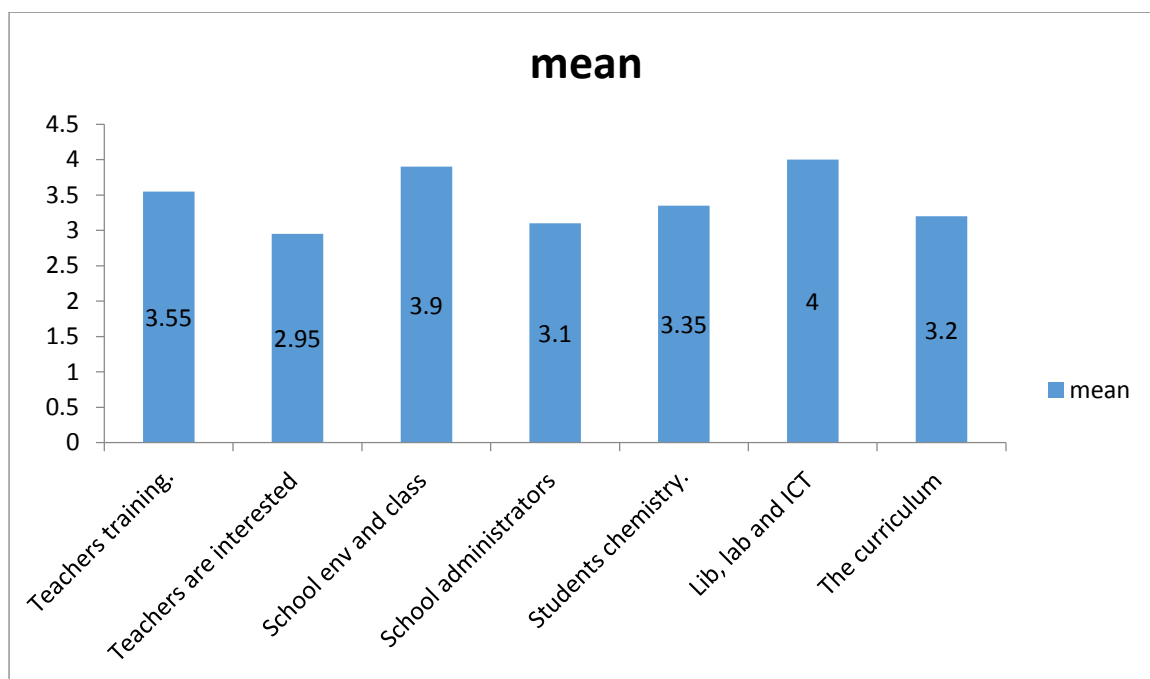


Fig 4. 2: TEACHERS RESPONSE CONCERNING MAJOR FACTORS AFFECTING LEARNER CENTRED APPROACH

Mean value rating scales were ≤ 1.5 =very high, 1.6-2.5=high, 2.6-3.5=moderate, 3.6-4.5=low, >4.5 very low

The above figure illustrates that the practical activities such as library, laboratory, ICT centres (M=4), school facility and class size (M=3.9), teachers training and awareness (3.55) affects more the implementation of learner centred approach.

As illustrated in the above table concerning questionnaire (15) teachers have enough training and awareness concerning LCM, 5% of the respondents said strongly agree, 20% agree, 10% of the respondents said neutral, 45% of the respondents said disagree and 20% replied strongly disagree. Thus the finding shows that almost majority of the respondents agreed that they didn't have enough training and awareness in practical implementation of learner centred approach. The next questionnaire item (16) teachers are interested and committed in implementing active learning in chemistry lesson, 20% strongly agree, 20% of the respondents said agree, 20% of the respondents replied neutral, 25% said disagree and 15% said strongly disagree. The data shows that, average of the respondents agreed that teachers are interested in implementing LCM. The next questionnaire item (17), concerning school facilities and class size 15% of the respondents agree, 10% of the

respondents said neutral, 45% of the respondents replied disagree and 30% of the respondents said strongly disagree. The result indicate that, majority of the respondents agreed that the school environment and class size is not conducive to implement learner centred approach. *The result coincides with (Tirualem, 2006). Which revealed that, the class size is one of the constraints which affects the implementation of LCM.*

Questionnaire item (18) stated as school administrators attitude in encouraging teachers in implementing LCM, 45% of the respondents replied agree, 15% of the respondents said neutral, 25% of the respondents replied disagree and 15% of them said strongly disagree. The data shows that majority of the respondents agreed school administrators have positive attitude concerning learner centred approach. Questionnaire item (19) stated as students consider chemistry is a difficult subject, 15% of the respondents replied strongly agree, 15% of the respondents said agree, 5% of them replied neutral and 50% of the respondents said disagree and 15% of the respondents said strongly disagree. The result indicate that majority of the respondents disagreed with this point. The next questionnaire item (20) stated as the availability and functionality of library, laboratory and ICT centres to encourage learning by doing. So, 5% of the respondents replied strongly agree, 10% said agree, 5% said neutral, 40% responding disagree and 40% replied strongly disagree. The result indicates that majority of the respondents disagreed with this point. The result from interview also confirmed that there exists some reference books in library and some computers in ICT centres in Sire and Catholic kidane Mihirete schools. The last questionnaire item (21) stated as, chemistry text book preparation is conducive to implement learner centred approach, 10% replied strongly agree, 30% said agree, 5% responding neutral, 40% replied disagree and 15% responding strongly disagree. The result indicate that, almost majority of the respondents disagreed with this point. .

Table 4. 10 Regression Result with Implementation of Learner-centred Approach and Determinant Factors

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.870 ^a	.757	.615	.670

a. Predictors: (Constant), text book preparation, directors attitude, curriculum prepared for grade level, teacher training & awareness, presence of laboratory, library, class size facilities, teachers interest

Predictors (constants), school administrators attitude toward learner-centred approach, curriculum prepared for grade level, teachers training and awareness, presence and practical implementation of laboratory, library, class size facilities, teachers interest towards learner centred approach are affect the dependent variable by 0.757(75.7%) of R square.

According to Mujis (2004) model if Adjusted R Square : < 0.1 poor fit, 0.11 -0.3 modest fit, 0.31-0.5 moderate fit and if it is > 0.5 strongly fit. The Adjusted R Square result from the model for this result was 0.615. Researcher concluded that the model is strongly fit based on (Mujis, 2004)

Coefficients ^a						
Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.	
	B	Std. Error	Beta			
1	(Constant)	1.031	1.257		.821	.428
	teacher training & awareness	.398	.136	.419	2.929	.013
	teachers interest	-.035	.131	-.045	-.267	.794
	class size	.226	.162	.214	1.394	.189
	directors attitude	-.095	.146	-.102	-.651	.527
	Curriculum prepared	.365	.118	.455	3.096	.009
	presence of laboratory,library	.661	.151	.715	4.381	.001

The above table indicates linear regression models used to determine factors that affect or influence the implementation of learner centred approach in the study area including teachers training and awareness, teachers' interest, school administrators' attitude toward learner centred approach, adequate facilities, curriculum prepared for grade level, presence and practical implementation of library, laboratory and ICT centres. The result indicates independent variables like; school facilities like presence and practical implementation of library, lab. Activities & ICT ($\beta=0.715$), curriculum prepared for grade level ($\beta=0.455$), teachers training and awareness ($\beta=0.419$) class size ($\beta=0.214$), respectively influence the dependent variable. The negative sign indicates there are a reverse relationship between dependent variable and factors.

4.3 Presentation and Discussion of Data from School administrators Interview

In supporting the evidence presented in the previous pages, some qualitative information was obtained from interviews of the school administrators from selected preparatory schools. The findings of the interview were categorized and discussed under the following themes.

The first question stated as, 'How do you evaluate the practical implementation of student centred methods with reference to teaching chemistry in your school? Concerning this question almost majority of sampled schools respondents replied that, the degree of implementation of this method is low.

The next question is stated as, 'What are the major problems exists in your school which hindered the implementation of learner-centred approach in teaching chemistry in your school?' Responses made by each school respondents concerning the problem they faced to implement this approach is listed as follows:-

High student population in each class or large class size, lack of initiation on the side of students due to lack of former established experience and hence showing disinterest, teachers lack interest, due to absence of training concerning the implementation of the method, some are also attached to the former method of teaching and resisted the method demanded. The role of management concerning continuous follow up is very low, the school management didn't prepare the budget demanded for laboratory activities.

Moreover, the weekly period allotted for the grade level is not sufficient to cover the lesson. Therefore, most of the time teachers used lecture method to cover the content.

The third question stated as, 'Is there any mechanism of encouragement employed by the school administrators? For teachers who are endeavouring to apply LCM in teaching chemistry.

Concerning this point majority of respondents agreed that, teachers prepared their lesson plan in accordance with students' activities. However, in its actual implementation they use lecture method. There for such activities are not inviting the administrator for rewarding or initiation.

The fourth question stated as 'Is there any library, laboratory and ICT centres in your school? How is its performance? Regarding the school environment and infrastructure, the responses made by each school respondents are different, accordingly their response is as follows:-

In one school respondent mentioned that, critical problems were observed in the school environment. This is because the school environment and class size are not conducive at all. Moreover, the school building and its administration itself is in a very congested situation, concerning the basic infrastructure such as ICT centre, library, and laboratory all are not available.

In two preparatory schools, there are lab. rooms with some chemicals and laboratory equipment's; so, the rooms might be opened to serve other purposes. Hence, the students made nothing practical activities as expected. The reason forwarded were:- there is no lab. technicians in the school to utilize the available chemicals and lab. equipment's, it is difficult to use any chemicals.

In one school the response forwarded was except the building itself; there is no chemicals and lab. equipment's at all. Hence, no task of practical performance of laboratory activities in the school.

What is common to the three school as they mentioned is that, the presence of library but lacking update and current reference books. Hence it is not attracting not only for students but also for teachers. ICT centres also available in three of them. But, the problem

forwarded was the availability of computers were very minimum in relation to the number of students. As internet service is not open students are not utilizing the resource.

The last question forwarded for the respondents is for the problem stated above, what solution would you suggest? They suggested as follows:-

Out of the stated schools the problem that encountered in one school is unique and needs special attention. The presence of lab. activities, ICT and library are decisive to teach chemistry. But none of these are present. They suggested that, all the stakeholders should give attention in order to continue the teaching learning process.

In general what the rest schools suggested in common as a solution is, to avoid the current abundance of students in each class, build additional classes. Even if budget is available currently the market is not supplying laboratory technicians, it is suggested that the government should provide training program with specific demand of such problems.

To exercise and perform lab. activities in school laboratory standard laboratory manuals for each grade level is essentially demanding. So it is expected to be prepared centrally and distributed to each schools.

As the respondents mentioned there exists a considerable problems in implementing learner centred approach in chemistry lesson. So, it needs additional training and awareness not only for teachers but also for students to develop experience on the implementation of learner centred teaching from lower grades in order to bring behavioural change.

4.4 Discussion and Presentation of Data from Focus Group

As stated earlier, the purpose of this study is, to assess the extent or the degree of student centred teaching approach is practically being implemented in the schools under the study. In this respect, to forward what exactly succeeds pertaining the topic under the study employing different methods or approaches that enable us to get reliable information is essential. The purpose of this focus group discussion also designed in light of this basic concept.

Regarding the students; those involved in responding the questionnaire were disregarded. This is also intended to avoid the duplication of ideas, by involving new participants. The total number of the group was ten.

After the purpose of the study was introduced by the writer of this paper, the discussion was set. The role of the researcher during the discussion was to facilitate conducive environment in which participants can generate their ideas freely. In this discussion, no idea that contradicts or deviates from the other sources of data or information. Among the ideas generated and commonly agreed up on are stated below.

The first item stated that, How do you evaluate the implementation of learner-centred approach in your school? Concerning this point almost majority of the respondents agreed that in the sampled preparatory schools the stated method of teaching which learner-centred approach is not practically seen as desired or expected. The second item stated as, what are the major problems do you think that hindered the implementation of learner-centred approach in chemistry lessons in your school? Among the emphasized problems that respondents mentioned are:-

Abundance or number of students in a class, the school don't commence at the proper academic teaching time, lack of conducive school environment and lack of school infrastructures, teaching periods of the year is wasted due to different reasons. As they mentioned, due to this problem teachers used the method that assists him/her to cover the portion on the text assigned for the year. The method he/she employ is usually lecture method, the volume of the student text and the period allotted for the level is not proportional. Therefore, teachers are forced to rush. When this is coupled with wastage of teaching periods, in most it appeared as a reason for portions remaining uncovered. Moreover, teachers usually display less tendency for the method; and also do not possessed a profound concepts in practical implementation.

The third item stated that, How do you perceive the efficient utilization of laboratory, library and ICT centres? Concerning this idea all respondents forwarded the same idea which stated above in the interview.

The next item stated as, How do you evaluate the attitude of both teachers and students toward learner-centred approach? Concerning this point majority of the respondents mentioned that, most teacher think that learner centred approach is very important for students in developing problem solving skill, self-esteem, develop critical thinking etc. but

most of the teachers lack the skill in implementing LCM and other related factors stated above. Concerning students they replied that majority of them resist the formal non-lecture approach due to lack of former established skills.

The last item stated that, what recommendation do you forward to alleviate the stated problems in teaching chemistry? Regarding this point majority of the respondents replied that, it is impossible to get rid of the problems at once. It demands the immediate intervention of the stakeholders, to undertake the demanding tasks, in avoiding the problems of respective schools stepwise, so that, they will develop the potential implementing the desired teaching approach.

CHAPTER FIVE

SUMMARY OF MAJOR FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

This chapter incorporates summary, conclusion and recommendation part of the study. The purpose of the presented study were to examine the degree of implementation of LCM and the difficulty that can be faced in implementing learner-centred approach that brings active learning in teaching chemistry lessons .

5.1 Summary of Major Findings

This piece of study was undertaken to investigate the degree of implementation of learner centred approach in selected preparatory schools found in East Wollega zone. Based on the main objective the study was intended to answer the three basic research questions. Such as to what extent chemistry teachers implement the LCM, second what teaching methods and techniques are very often employed by chemistry teachers and what are the major challenges of chemistry teachers in implementing the learner centred method

The methodology used for the study is descriptive survey method with qualitative and quantitative approach. Three research tools were employed for the study to answer the basic research questions. These are questionnaires, interview and focus group discussion.

5.2 Conclusions

The major findings of the study can be summarized as follows: the data generated by questionnaires, interview and focus group discussion revealed that the:-

- The result obtained from teachers, students and school principals concerning the degree of implementation of learner-centred approach is, this methods is not being implemented as expected in chemistry lesson; it was found that there is a gap in understanding the concepts of learner-centred approach and practical implementation of this methods.
- The second part of students and teachers questionnaire revealed that, as indicated in part one teachers role in implementing teaching methods which facilitate active learning like group work, assignment discussion, managing individual activities and feedback, adjusting the time for practice and students participation, using models,

charts, diagrams, project work, etc. which facilitate learner centred approach in class room didn't implement as expected.

- The result obtained through interview also revealed that most of the time teachers used lecture method in order to cover the content or the instructional material prepared for grade level. Moreover, some teachers are attached to the former lecture method and resisted the method demanded.
- Concerning teachers lack of necessary training and awareness, even if most teacher agreed on the idea that learner centred method had great importance in developing students interest, self-esteem, problem solving skill, etc. teachers lack the way practically implement this method.
- Challenges or constraints which hindered learner centred approach are; the school environment, class size, lack of practical implementation of laboratory activities, insufficient reference books and computers, the curriculum prepared for grade level, and so many related factors influence the implementation of learner-centred approach in chemistry lesson.
- The result from interview revealed that even if school administrators have positive attitude towards learner centred approach; however, there is a gap in practical implementation and continuous follow up.
- The result obtained from regression analysis is that out of the stated variables which can hindered the implementation of learner-centred method is that; school facility like laboratory activities, library and ICT ($\beta=0.715$), curriculum prepared for grade level ($\beta=0.455$), teacher training and awareness ($\beta=0.419$), class size ($\beta=0.214$) respectively affects more the implementation of learner centred approach.
- Another point mentioned by the interviews is that, wastage of teaching periods due to different reasons occurred in academic days of the year. Therefore, teachers forced to use lecture method to cover the content.
- Concerning findings obtained from focus group discussion which didn't stated in the other part is that the volume of student text books and the period allotted for the level is not proportional.

In general the degree of implementation of learner centred methods in schools under study is low; most chemistry teachers used the traditional or lecture method of teaching; due to

lack of conducive school environment, class size, the curriculum prepared for grade level such as content over load, student and teachers' attitude, lack of teachers training and awareness, etc. contributes for the low or poor implementation of learner-centred approach.

5.3 Recommendation

Based on the data interpreted and conclusion given above the recommendations were stated as follows

- The government should give attention for teachers role in the classroom will be improved by facilitating staff training, in-service training, and workshops. This all helps the teacher to share experiences on coping with the prevalent problems such as large class size, insufficient teaching materials, lack of laboratory activities, content overload, etc.
- As much as possible chemistry teachers should give attention to practical activities such as using models, concept maps, charts, diagrams, etc. because chemistry is an experimental science and it has abstract concepts.
- In order for teachers to be able to practice student-centred approach in the classroom, necessary steps should be gradually taken by the concerned bodies to alleviate constraints that hindered its implementation. Although not possible with short period of time.
- There should be much attention or emphasis is given in promoting the implementation of learner-centred methodology in lower grades to build experiences and to have a positive attitude in the future.
- Most teacher have lack of training and awareness on the implementation of student centred methods. Therefore, It should be constructed or modified to provide teachers with the skill and confidence to exploit it
- Proper consideration should be given to tasks or activities that would promote active learning such as, cooperative learning, discovery learning, problem solving, etc. in addition to this teachers should give ample time for students to practice and participate actively in group works by organizing, guiding, and supervised each activities in order to achieve the desired objectives. As this piece of research is only an initial work, the writer would like to suggest that future research should under taken how the learner-centred method is being implemented.

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APPENDIX - A

Date of Questionnaire filled-----

ADAMA SCIENCE AND TECHNOLOGY UNIVERSITY SCHOOL OF APPLIED NATURAL SCIENCE PROGRAM OF CHEMISTRY

QUESTIONNAIRE TO BE FILLED BY TEACHERS

Instruction

The main purpose of this questionnaire is to investigate the extent or degree of implementation of learner-centred approach in chemistry lesson with selected preparatory schools found in East Wollega zone. Therefore, you are kindly requested to reflect your view or opinion by giving response to each question, please. After reading each item carefully, put 'x' in the space provided mark of your choice.

NB-Writing your name is not needed.

Thank you for your cooperation in advance

PART –ONE - PERSONAL INFORMATION

1. Sex___ a) Male_____ b) Female_____
2. Age_____
3. Educational Qualification: 12+1_____, 12+2_____, 12+3_____
12+4_____MA/MSc_____, Others
4. Marital status:
_____A) Single
_____B) Married
5. Teaching experience-----

PART – TWO

I- Major Challenges of Chemistry Teachers in Implementing Learner-Centred Approach.

Direction

Read each item carefully and put mark (x) under the corresponding column

No	Item	OP	SA	AG	NEU	DA	SDA	TOT	M	SD
15	Teachers have enough training and awareness in facilitating active learning in chemistry lesson.	F %								
16	Teachers are interested and committed in implementing learner-centred approach	F %								
17	School environment and class size is conducive for the implementation of LCM	F %								
18	School administrators provides necessary support and encouraging teachers towards the implementation of LCM	F %								
19	Students consider chemistry is not difficult subject	F %								
20	Library, laboratory and ICT centres are available & it is practically applicable	F %								
21	The curriculum Prepared for grade level is foster learner centred learning	F %								

8. Among the teaching methods stated which one do you suggest to be more applicable in teaching chemistry?-----

9. Please, would you state the most pressing problems for the implementation of learner-centred approach? -----

10. Is the class size and the school environment comfortable to implement active learning in chemistry lessons? -----

11. In your school how do you judge the extent of implementing learner-centred approach in chemistry lesson? -----

II- Techniques and Strategies used by chemistry teachers to enhance their students' academic performance.

Instruction

Read each item carefully and put mark(x) under the corresponding column.

No	Item		SA	AG	NEU	DA	SDA			
9	Teachers are committed in coordinating several learning activities such as cooperative learning to increase student interest and motivation	F %								
10	Teachers guide students by giving a clear and specific direction for different activities	F %								
11	Teachers using instructional strategies that are provides students with tasks that require theory and practical activities	F %								
12	Teachers identifies the need of students and provide individual support in chemistry lesson	F %								
13	Teachers facilitate inquiry learning in chemistry lesson to increase students participation	F %								
14	Teachers utilize d/t kinds and procedure of assessments and mechanisms of feedback to enhance students achievement	F %								

III-Degree of implementation of learner-centred approach in Chemistry lesson.

Instruction

No	Item	AL	US	ST	RAR	NEV
1	Teachers create a learning environment by organizing group discussion/work					
2	Teachers facilitate the teaching-learning process by adjusting time for activities to practice and participation					
3	Prepare the lesson plan that address the targeted performance objectives & emphasize critical thinking, problem solving, communicating skill					
4	Teachers using resource materials like models, charts and diagrams to bring meaningful learning					
5	Teachers gives a project work individually or in group to initiate learning by doing					
6	Teachers use teaching aids and other supportive materials to improve teaching and learning process					
7	Teachers Helping their students when they are doing exercises and gives feedback					
8	Teachers helping their students in doing experimental work during laboratory session					

APPENDIX-B

Date of questionnaire filled-----

ADAMA SCIENCE AND TECHNOLOGY UNIVERSITY SCHOOL OF APPLIED NATURAL SCIENCE PROGRAM OF CHEMISTRY

QUESTIONNAIRE TO BE FILLED BY STUDENTS

Dear student

This research is conducting a study on “Implementation of learner-centred approach in chemistry lesson with selected prep. Schools found in East Wollega zone.” The aim of this questionnaire is to collect reliable data for the study. Therefore, please be honest and feel free to provide genuine information. Thank you.

NB-no need of writing your name.

PART ONE-PERSONAL INFORMATION

Instruction

Read the following items carefully and put (x) in the space provided.

1. Sex A) Male_____ B) Female_____
2. Age_____
3. Grade_____
4. Marital Status A) Single_____ B) Married_____

PART-TWO

I-Students response concerning the Major challenges of chemistry teachers in implementing learner-centred approach

Instruction

Read the following items carefully and put (x) under the corresponding column.

No	Item	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
1	The school environment and class size is conducive for active learning					
2	Our chemistry teacher is interested and committed to implement active learning					
3	Directors and other school members are facilitating active learning to improve students' academic performance					
4	Students are interested in group work rather than individual work					
5	I am interested in learning chemistry					
6	Our school have library, laboratory and ICT centre.					
7	Our chemistry teacher supports us by facilitating cooperative learning in the class room.					

II-Techniques and strategies used by chemistry teachers to enhance their students' academic performance.

No	Items	Strongly agree	Agree	Neutral	Disagree	Strongly disagree	
8	Our chemistry teacher tries to get our attention before delivering the instruction						
9	Our teacher Gives us a clear and specific direction for each activities						
10	Conducts discussion with the students to improve teaching-learning process						
11	My teacher uses different method of teaching during chem. Lesson						
12	The teacher encourages us to participate actively in teaching-learning process						
13	The teacher supports each student by giving a feedback for activities						

III-Students response concerning the degree of implementation of learner-centred approach in chemistry lesson.

No	Items	Always	Usually	Some times	Rarely	Never
14	The teacher arranges and organize group discussion					
15	Chemistry teacher gives us ample time to practice and participate in different activities					
16	Our teacher uses different models, charts to present the Lesson					
17	Our teacher encourages and supports students to take responsibility for their own learning					
18	Our teacher gives us a project work individually/group					
19	Appreciates a model student in the class and uses as a role model					
20	Encourages and helps us in doing experiments During lab. Sessions					

APPENDIX-C

Interview with School Principals

The purpose of this study is to investigate the implementation of student-centred teaching method in teaching chemistry in selected preparatory schools found in East Wollega zone. Your school is among the selected ones for this study. So, you are kindly requested to respond with concern and by giving due attention for each questions.

1. How do you evaluate the practical implementation of learner-centred method with reference to teaching chemistry in your school? _____

2. What major challenges or problems do you consider in practical implementation of learner-centred method in teaching chemistry in your school? _____

3. Is there any mechanism of encouragement employed by the school administrators for teachers who are endeavouring to apply learner-centred method in teaching chemistry? _____

4. Is there any laboratory, library, and ICT centre in your school, that are Regularly utilized by the students and other school community? _____

5. What do you think is there possible solutions for the challenges? _____

APPENDIX – D

Focus Group Discussion with Selected Teachers and Students

The purpose of the study is to investigate the implementation of learner-centred approach in teaching chemistry lesson in selected preparatory schools of East Wollega Zone. Your school is among the selected ones for this study. So you are kindly requested to respond with concern and by giving due attention for each questions.

1- How do you evaluate the implementation of learner-centred approach in chemistry lessons in your school? -----

2-What are the major problems do you think that hindered the implementation of learner-centred approach in chemistry lesson in your school? -----

3-How do you perceive the efficient utilization of laboratory, library and ICT centres in your school?-----

4-How do you evaluate the attitude of both teachers and students towards learner-centred approach?-----

5-What recommendations or suggestion do you forward to alleviate the stated problem in teaching chemistry? -----
