ADDIS ABABA UNIVERSITY
SCHOOL OF GRADUATE STUDIES

Department of Curriculum and Teacher Professional Development Studies

The Implementation of Science Curricula in Missionary Owned Secondary Schools of Ethiopia: The Case of Catholic Church Schools in East Shoa, Oromia Regional State.

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July, 2007

The Implementation of Science Curricula in Missionary Owned Secondary Schools of Ethiopia: The Case of Catholic Church Schools in East Shoa, Oromia Regional State.

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Abbreviations

AAU	: Addis Ababa University.
ECCS	: Ethiopian Catholic Church Secretariat.
EMPDA	: Educational Materials Production and Distribution Agency.
ESDP	: Education Sector Development Program.
ETP	: Education and Training Policy.
FGD	: Focus Group Discussion.
ICDR	: Institute of Curriculum Development and Research.
ICT	: Information and Communication Technology.
IER	: Institute of Educational Research.
MOE	: Ministry of Education.
NGO	: Non Governmental Organization.
UNESCO	: United Nations Education, Science and Cultural Organization.

ABSTRACT

This study was sought to understand how missionary owned secondary schools implement the science curricula of grade 9 and 10 vis-à-vis the Education and Training Policy of the country. The study was conducted on three Catholic Church owned secondary schools in East Shoa Zone. To achieve the objectives of the study, all school principals (3 in numbers) and all science teachers (14 in numbers) were selected based on their availability and 140 students were selected through simple random sampling technique.

In-depth interviews with principals, focus group discussions with science teachers, observations and questionnaires for students and teachers were employed to collect data for this study. The data obtained were analyzed using both quantitative and qualitative analysis methods.

The study revealed that the surveyed schools were successful in creating of conducive teaching learning context for science curricula in terms of supply of infrastructures, instructional facilities, and material resources (physically), creating good communication channel among school communities and providing in-service training programs for teaching staff. That is, they attempted to invest more for successful implementation of science curriculum materials.

In contrast to these facts, most of activities observed in the schools were not congruence with the statements of curriculum materials. This is evident that principals and teachers performance with regard to the requirements of curriculum materials were found minimal and students' attitude of learning science subjects was also not as expected. In general, it was found that the schools don't implement the science curricula as intended. Attempt has been made to identify factors that hinder the successful implementation of curriculum materials. Among the factors identified: the complex nature of school management structure, shortage of relevant instructional material resources in the schools for grade 9 and 10 science subjects, lack of commitment on the side of principals, students and teachers to utilize the available school resources, absence of collaboration trend between mission schools and governmental bodies and absence of relevant in-service training programs for teachers were found the major challenges that hinder the effective curriculum implementation process in the surveyed schools.

CHAPTER ONE
INTRODUCTION

1.1 Background of the study

The development of any nation can be viewed in economic, social and political terms. All of these are interrelated and are very important for national development of all rounded. As Hopper (1990:343-347) described, education is a part of socio-economic development, which is a powerful instrument to national development since it has significant role in generating and transmitting knowledge, values and attitudes. In particular, education is important for improving science and technology, promoting labor productivity and human resource, enhancing culture, etc.

This entails that, in order to advance national development, countries should give attention for expansion and improvement of their educational system as one means in terms of access, quality, relevance and equity for all of their citizens. It is well realized that such goals of education can't be achieved through the limited resource of the government alone, particularly for developing countries. But, different stakeholders such as: non governmental organizations, communities, religious institutions, private agencies, international agencies, development partners etc should actively participate in the sector to bring the intended goals of development through education.

As Teshome (1979:10-12) assert, any account of Ethiopian education sector must recognize the contributions made by religion institutions such as Christianity (Orthodox, Catholic, Protestant, etc), Islam and Judaism. They have been co-existed in education activities of Ethiopia for centuries and all have founded schools for their adherents' children. In the same vein, the Ethiopian Catholic Church Secretariat document-ECCS (2006:1) noted that educational institutions of Catholic Church have played their own role in the development of the education sector of the country, particularly in provision of educational access and equity throughout the nation. According to the document, the Ethiopian Catholic Church founded its first school in 1845 and currently, there are about 311 educational institutes that range from pre-primary (KG) to tertiary

which are under administrative and financial control of Catholic Church Secretariat in Ethiopia. Among these educational institutes, 58 schools are currently functioning as general secondary schools.

From the time of foundation yet, the church schools have facing different challenges, particularly in the middle of 19th century. In this regard, the Ethiopian Catholic Church Secretariat education document-ECCS (2006:3-9) indicates that during middle of 19th century there were no explicitly written policy documents valid for all schools of the mission. The task of deciding what kind of educational system would be appropriate for each region was left much for the initiatives of priests and missionaries from abroad working in the respective areas. Many adopted the language and culture as well as the curriculum of their homeland that were not relevant for Ethiopian context.

However, starting from 1994 the Ministry of Education required all to adopt or follow one common curriculum that is prepared for national education system as a whole. Since then, the Church schools started to follow the Education and Training Policy of the Federal Democratic Republic Government of Ethiopia. The task of church schools is implementing the curriculum in collaboration with governmental offices in the respective areas, but they do have full autonomy in financing and administrating the church schools based upon their own internal policy.

Moreover, the Education Sector Development Programs- ESDP I (1997:46) and II (2002:67) of MOE stated that the government promotes the education sector through appropriate policies on investments at all level by private sectors, non-governmental organizations, religion organizations and the communities' institutions. Thus, government plays crucial role in policy development and standard settings. It develops curriculum and its implementation strategies, provide supervision, set standard for facilities, and issues licenses for the institutions.

Accordingly, the agreement of Ethiopian Catholic Church Secretariat and Ministry of Education in August, 1994 shows that the Institute of Curriculum Development and Research (ICDR) is responsible for preparation and distribution

of curriculum materials (textbooks, syllabi, teachers' guides etc) for the church schools.

Currently, there are eleven set of curriculum materials that are implemented in general secondary schools (grade 9 &10) of Ethiopia and hence in missionary owned schools. Three of the eleven subjects: Chemistry, Physics and Biology are categorized under natural science stream. According to EMPDA curriculum materials (1989), science courses offered in secondary schools are commonly seen as broadly supporting policy objectives of the country that are essential for economic, social and political affairs of the society. Thus, these subjects in general aimed at preparing both body of future scientists who can play a key role in national development and in having broader purpose of developing scientifically literate citizens. According to the documents, in order to achieve the stated general objectives, science curricula are designed to help students in acquiring: a thorough foundation of knowledge, practical skill in application of knowledge and conviction of the value. More specific objectives are given in the respective syllabus.

Similarly, Bekalo and Welford (2000:95) noted that secondary school science curricula of Ethiopia have very crucial role to play for students who are going to specialize in science streams such as engineering, agriculture, health, computer, teachers for science subjects, environmental science, etc. They are also important for any students to cope up with life out side academic environments. Moreover, UNESCO (2003:11) in the document of guidelines for policy-making in secondary school science and technology indicated that a more science literate populace is perceived as being better equipped to contribute to sustainable economic development and to the social welfare.

Thus, due to such significance of the science curriculum for national development and students' academic life, it is necessary to give due attention for development of the curriculum in general and for its implementation process in particular.

There should be evaluation of the curriculum implementation activities at school level. To strength these idea Marew (2000:68), McCormick and James

(1983:301) and Fullan (2001:153) stated that curriculum implementation evaluation enables to identify or predict in process defects, in procedural design or its implementation, help decision makers to identify how far from the ideal program deviates, and support an organization in achieving its goals. In general, evaluation of curriculum implementation deals with the question of whether what is planned in the curriculum document is put into action and to what extent the intended plan is translated into practice.

1.2 Statement of the problem

In Ethiopia, educational researches made in governmental schools by graduate student-researchers of AAU: Alemayehu (2005) in the study of evaluation of teachers performance in implementing geography curriculum in Gore secondary school; Akaleweld (2001) in the study of the nature and purpose of practical one in the science curriculum materials in Addis Ababa; Solomon (2000) in the study of an evaluation of implementation of grade 8 mathematics syllabus in Sidama Zone and Dawit (1999) in the study of an evaluation of 7th grade English syllabus in East Gojam, have all reported in their findings, the existence of prevalent gap between designed 'intents' (the program) and what is actually in practice at the classroom level.

In most of the above studies teachers' classroom performance were found inefficient. Many teachers were using the traditional methods of teaching- talk, chalk and rote memorization of facts, ideas, and principles instead of using techniques and strategies suggested in the syllabus. The reasons identified in most of these studies were poor infrastructures, high student-teacher ratio, teachers' lack of pedagogical capability towards educational innovations, insufficient central support for teachers, lack of awareness by the schools communities about the new approach of the education system, poor school management system, overload of school time table, schools financial problem and many others.

However, there is no research work done before this study in relation to curriculum implementation activities in missionary owned educational institutions, particularly in Catholic Church schools. So there is no evidence that

indicate the existence or nonexistence of the above problems in these types of schools or research that indicate how mission schools implement the prescribed curricula into practice. Thus, as a part of Ethiopian schools, specific studies are required to perceive the practice of curriculum implementation in missionary owned schools.

The purpose of this study is, therefore, to evaluate how the selected Catholic Church owned schools in East Shoa Zone implement the science curricula of grade 9 & 10 as per the requirement of the Ministry of Education.

1.3 Specific objectives of the study

The study has the following specific objectives:

- examining the overall activities of the mission schools in implementing the Education and Training Policy of the country, particularly that of science curricula.
- evaluating the appropriateness, relevance and utilization of human as well as material resources available in the mission schools for translating the intended science curricula into practice.
- evaluating how the mission schools context in terms of their management system, communication system and staff development programs are suitable for effective implementation of science curricula.
- evaluating to what extent the actual implementation process of the science curricula motivate students' to bring the intended attitudinal changes.
- identifying challenges [if there is] that hinder effective implementation of science curricula and recommending possible solutions for the problems.

1.4 Research questions

Accordingly, in line with the purpose of the study, the following broad and specific research questions are set:

Broad research question

How do missionary owned secondary schools implement the science curricula vis-à-vis the Education and Training Policy of the country?

Specific research questions

1. Is there congruence between the implementation practices of Catholic owned secondary schools and the intention of the science curricula?
2. How conducive is the context of missionary owned secondary schools to implement the science curricula?
3. What successes and/or challenges Catholic owned secondary schools achieved and/or encountered in the process of translating the prescribed science curricula into practice?
4. Is the current teaching learning practice of science subjects in the selected schools develops positive attitude on students?

1.5 Significances of the study

It is hoped that the findings of this study will help in the following instances:

- It helps in particular the Catholic Church Secretariat and in general others religious educational institutions that support secondary education, to evaluate and improve their activities of translating the science curricula into practice.
- It helps governmental bodies (MOE, Regional and Zonal Education Bureaus) to give due attention for the prevailing conditions of missionaries owned secondary schools in the region, but in particular for surveyed schools.
- It provides information for teachers, principals, students, parents and school administrative bodies (Catholic Church Secretariat) to improve the actual teaching –learning experience of science subjects.

- It can serve as feedback for the respective schools about the implementation process of the science curricula by identifying their successes as well as challenges.
- Furthermore, this study can serve as a base line work for future in-depth investigation at national level.

1.6 Delimitation of the study

This study is delimited with the performance of the Catholic Church owned secondary schools in implementing science curricula in East Shoa Zone of the Oromia Administrative Region. Thus, the findings of this study reflect only the activities of these schools in the 1999 E. C since all information (data) are collected in this academic year. The delimitation has been made for the following main reasons:

- easy access of information from the area by the student-researcher.
- secondary schools of the Church in this Zone are experienced in implementing curriculum materials since most of them have more than ten years experience.

Moreover, among many variables that influence the implementation process of the science curricula, only the following variables are considered in this study:

- Teaching learning activities in the schools: - principals' performance, teachers' performance in applying the prescribed duties and responsibilities in the curriculum documents.
- Students' attitude developed towards science subjects as a result of curriculum implementation practice in the surveyed schools.
- Organizational factors: physical facilities, instructional facilities, management system, communication channel and staff development programs for the school communities.

1.7 Limitation of the study

This study have been limited with regard to literature resources, particularly about historical development of missionary owned schools in Ethiopia as well as current activities of missions in education sector of the country. However, maximum effort has been made to search literatures and documents from the education department of Catholic Church Secretariat and Ministry of Education. Though such documents are not sufficient, they properly used to increase the quality of the present study.

1.8 Definition of terms

Missionary owned schools:- formal educational institute established, equipped and provided staff and funded by religious organizations, not designed to make profit. (Schools owned and run by the Catholic Church)

Educational Innovation:- the act or process of inventing or introducing of something new to education system. It may be the policy statements, the curriculum materials, teaching methods and strategies, pedagogical assumptions or theories etc.

Successful Implementation of Curriculum:- it is the actual use of the requirement of the curriculum by implementers so that it is congruent to the intended or planned use.

Organizational Performance:- it is the appropriateness of the organization to hold activities as the requirements of its duties and responsibilities.

Curriculum Materials- it includes policy guidelines, strategic plans, syllabi teachers' guides and textbooks that are prepared by MOE.

CHAPTER TWO

REVIEW OF RELATED LITERATURES

2.1 Historical development of missionary owned schools in Ethiopia.

Most of the early literatures on the development of school in Ethiopia written by scholars, have not described the exact date when the missionaries started in offering formal education to children. But, they suggested their assumption that missionaries educational activities go back to the earliest days of their introduction in Ethiopia during the period of king Ezana of Axum in 330 A.D.

Religious (also called missionary) owned schools in many cases of Ethiopia developed for historical reasons, or through society tradition. The majority of these schools were founded by Orthodox, Catholic, Protestant, Muslim etc.

Evident that, several scholars have put their efforts to study the history of formal Education in Ethiopia. Teshome (1979:27-29), for instance wrote, Christian missionaries were not as important in founding secular education in Ethiopia. This may be true; the contribution of the missionary society should not be under estimated in the history of formal education of the country. Tekeste (1990:2-6) on his part also stated, the various missionaries did certain amount of educational work starting from the early period, but not a great deal; their curricula was suitable only for training youth to be interpreters'. The author expressed by his words:

> "...their contribution to the problem of education of the masses is not as yet of much value ... unfortunately dogmatic religion rather than useful education seems to be the aim of at least some of them."

Likewise, Anderson (1970:1-5) stated that Europeans didn't bring the idea of formal education to Africa; in many ways this had been established in Africa society long before their arrival. Yet through such practice as grouping children into classrooms for regular daily lessons, emphasizing the importance of reading and writing and showing particular concern over examination resource, Europeans (both colonial and missionaries) have done much to shape African's more recent understanding of the school.

From the time of the earliest missionaries in the country, Christianity and education had been in highly bound together. Varying in degree form those who believed the most rudimentary knowledge was necessary for conversion to those who demanded as high and educational level as possible, agents for the church and the literacy movement marched in lockstep.

Ethiopian scholars like Girma (1967:10], Tekeste (1990:36) and Teshome (1979:27-28) notes, the activities of missionaries in Ethiopia aimed in two dimensions. First, the primary concern of missionaries' society is evangelization through churches founded in different areas of the country. Second, the pattern of using the school (education sector) as an agent for evangelization purpose had been developed. These ideas may be supported if we look the recommendation of the Bishop of Roman Catholic Church to the missionaries, who came to Africa in 1975

> "... don't to follow the ordinate method of conducting a mission, not to settle down at one place, establish school and collect a nucleus of adherent round them...schools." (Catholic Church document: August, 1975:1032)

These imply, missionaries used the schools as a means to collect children to transmit their own ideology of religious conviction rather than helping of African children through education, but there might be exceptions.

In the same vein, Sifuna et al (1994:11) explained that most missionaries considered education as the entire process of developing human abilities, potentialities and behaviors. Education is an organized and sustained instruction meant to transmit a variety of knowledge, skills, and attitudes necessary for the daily activities of life. It is also a social process in which an individual attains social competence. Thus, for ancient groups of missionaries, education is the means to lead and save the learner towards glory of being with God. The sole purpose of education was religious/moral, through which the learner would again control over himself and his environment.

Supporting this, study made in Kenya by Anderson (1970) show that the missionaries tend to concentrate on the school capacity to socialize the youth; assuming that this would enable them, by manipulating the content and level of

teaching, to influence the development of the African's skills and values. The Africans on the other hand, focusing mainly on the school's function of mobility, hoped that through formal education they would gain an increasing share of the position of wealth and authority being created around them.

Moreover, Teshome (1979:33) state, the central mission schools began to extend their courses and able pupils to be trained as catechists and increasingly as teachers. In most cases these people had to fulfill a difficult dual role, serving the first instance the religious aims of the mission and in the second the educational demands of the people. The central school curriculum depended almost entirely on the originality of the particular missionaries concerned.

It has been stated also in Anderson (1970:6), despite missionaries to utilize the school in their plans to retain control over the society; they faced challenges in implementing their ideas or innovation. Since they directly copied the curriculum of their homeland without considering the context of Africa. Thus, there were exceptions, a general pattern developed in which curricula of missionary schools lacked relevance to Africa people.

The study made by UNESCO (1999:50-59), in context of sub-Saharan Africa implies, in addition to historical reasons of the expansion of religions in provision of education as an alternative or supplement to others (public or government schools) of the region, it also tended to take place:

- For reasons of access and coverage.
- For reasons of schooling conditions (eg. diversified demand).
- As a result of inadequate public supply or to reduce pressure up on the existing schools.

These ideas entails that beside the missionaries aims focusing on schools, the governments of sub- Saharan African encourage some of them to operate in different level of schools. For instance, Girma (1967:14) and Teshome (1979:28) states, Emperor Menelik and Emperor Haile Selassie of Ethiopia who had played great role in introducing of modern education in Ethiopia, tacitly encourage the educational activities of missions. Nevertheless, fear and suspicion of

missionaries was never entirely absent among general population or among the clergy of the Orthodox Church, which had monopoly on education sector of the country for centuries.

However, after the middle of 19th century most missionaries have reminded on friendly terms with the rulers and people of Ethiopia, whose feelings towards them have been ambivalent. By implication, Teshome (1979:86) shows that, in 1935, there were some 180 foreign missionaries in 119 mission stations scattered over the country, serving 6,717 students in Ethiopia. On contrary to this idea, there are evidences that imply the governments towards missionary schools were not consistent and were subjected to the immediate political and economic orientations. Due to different reasons, the degree of controlling these schools were met as so much held, particularly in the area of their curriculum, teaching force, quality for their education, learning achievements of their students etc.

Evidently Anderson (1970:94) implied in his study that initially the missionaries took very little direct interest in planning the details of school development in east Africa. Overall frames where laid down, but with in these the teaching nearly always from abroad, had great freedom to interpret their role as educational experts as they wished. Few of these early teachers in the respective school had much professional training or experience and for the most part, had to rely on their own conception of what a school should be, designing its structure, choosing the curriculum and basing their teaching resources. Anderson (1970:105) also demonstrated, in the schools, whatever, the intentions of the director, the preferences of students increasingly played a part in shaping the education, which the school provided. At first, mission students were largely prepared to accept the curriculum their school provided, but gradually the great majority chooses to apply themselves with much greater determination to academic subjects rather than to the religious instruction offered. This form of pressure acted slowly, effective and wide spread.

It seems for these reasons and others that starting from 1994 (transition government of Ethiopia), the ministry of education has developed a clear cut policies on the activity of private education as the whole. Together with the

community schools they are normally registered by public authorities, regulated by government legislations and may receive government supports (technical and materials). When private (missionary) schools were approved, they have to cooperate with governmental bodies; they have to obey the rules and regulations formulated by government bodies. Regardless of their internal management, the government approved private schools had certain common standards: followed the same syllabi and prepared students for the same national examination. This means that, currently the government of Ethiopia through MOE cooperates with missionaries in provision of education for its citizen.

That is why the MOE signed agreements with missions who participated in education activity of the country. The agreements highly focused on the learning environment of any mission school (both the contents and processes) that learners encounter are expected to meet the national goals set in the policy. For instance, in August, 1994 the MOE agreed with Ethiopia Catholic Church Secretariat which has been activity involved for provision of modern education in the country as;

- All activities of the mission should be based on policy of the government of Ethiopia.
- The mission school should implement the general curriculum of the country: should follow the same syllables, teachers' guides, textbook that are prepared by MOE.
- Formal responsibility for educational standards would be held by the MOE, whose experts would determine whether or not the school was meeting government requirements, but the general administrations and management of school remained with their own expense to the representative of the church.

Furthermore, MOE states in its Sector Development Programs II (2001:27) and III (2006:39) that the government cooperates with NGOS through crucial role in policy development and standard setting. It develop curriculum, provide supervision, set standard for facilities and issues licenses for the institutions and secure land or any other technical support for private sectors. In which the

government and non- governmental organizations partnership will be strength for a common and shared aims of provision of education for all in the country.

In conclusion, it is difficult to assess the missionaries' effects on education accurately. Their initial entry in the Africa, particularly in Ethiopian schooling, although initiated by humanitarian needs, was essentially evangelization purpose. The missionaries clearly had their reasons for initiating and controlling early schools; their educational work was, however, affected by political, social and economical condition of the continent.

More recently, most missionaries in Ethiopia undergo reform in their internal education policy that developed towards Education and Training Policy of the government of Ethiopia. For example, ECCS Educational Document (2006: 17-25) states,

> "...the church look the schools as place for character formation of the whole person: spiritually, psychologically, physically, socially and intellectually. It is only through the integral development of the person that it can produce good and responsible citizens for the church as well as for nation."

Furthermore, the church in the document stress that the development of this country lies on the development of the education sector in terms of access, relevance, equity and quality which is in line with the Education and Training Policy of the country.

2.2 The concept of curriculum implementation

Shiundu and Omulando (1992:30) asserted that curriculum is the way content is designed and delivered. It includes the structure, organization, balance and presentation of the contents and learning experience of a program in the classroom. As defined here, curriculum is a set of materials that included both contents and instructional guidelines. The set of materials may be from developer or may have been selected from a variety of materials organized by the school.

If a curriculum is a plan for an education program, it is prepared for some intended purpose. In this connection, McNeil (1990:124) also stated that the primary purpose of a curriculum is it's being used by formal schools with the

view to bring about behavioral change in the learners so that the objectives of education in general and the aims of schooling in particular could be met. To do this, the curriculum must be implemented.

The concept of curriculum and its implementation are highly interrelated. Dirbssa (2004:57) demonstrated that without curriculum there is no implementation and without implementation the curriculum material has little meaning. To this end, Pratt (1980:426) asserts:

> " curriculum change is a political process, question of 'who gets what ,when and how' perhaps because of its political nature, the question of implementation has often being ignored by curriculum writers and left to the administration management specialists, who have studied change and innovation extensively."

Thus, implementation is important part of curriculum development process which may lead us to the essence of curriculum implementation. There are two points of views in defining the process of the curriculum implementation. The first group of educators sees curriculum implementation simply as a process of translating the curriculum plan to the actual teaching- learning environment regardless of other factors which could influence the plan directly or indirectly. For instance, Shiundu and Omulando (1992:224) define curriculum implementation as the stage where the curriculum plan is translated into reality through classroom activities. Pratt (1980:306) expressed that the decision of curriculum developers to introduce the developed curriculum into school on a large scale marks the beginning of actual curriculum implementation. Similarly, Marsh and Wills (1995:209) and Beauchamp (1968:163) defined curriculum implementation as simply putting of the planned and developed curriculum into practice.

The second groups of educators see curriculum implementation as a separate component in curricular activities which involves extensive action by many parties requiring changing the individual's knowledge, actions and attitudes. For instance, Ornstein and Hunkins (1998:292) view curriculum implementation as an interaction process between those who have developed the program and those who are charged to deliver it. Fullan and Promfret (1977:336) on their part define

curriculum implementation as the actual use of an innovation or what an innovation consists of in practice. These authors further elaborated that the process of implementing a new curriculum is a highly complex task and therefore requires extremely skillful assortment of participants and relevant content for effective results and the task of curriculum implementation can be said to involve two main processes:

- Changing the attitudes of people; policy makers, administers, teachers, school supervisors, parents, the lay public and ultimately the learners themselves.
- Providing the necessary professional, technical and materials support for implementers to make the process more effective.

Thus, according to them, the people concerned must be persuaded about the worthwhile of innovation and facilities (materials and time) and personnel supports have to be delivered if the implementation is to be effectively realized.

Likewise, Fullan (2001:60-76) contend that effective implementation requires designers and implementers to grasp the context in which the new curriculum is to be introduced. The structure of organization, tradition, power relationships, and how members define themselves and their role as participate. Hence, all teachers, supervisors, principal, community, students and all stakeholders must be clear about the purpose, the nature and the real and potential benefits of the innovation.

Ornstein and Hunkins (1998:299-316) expressed that successful implementation of curriculum result from careful planning, which intern focuses on three parameters: the people, program and organization. If an innovation or reform is to be fully implemented, at least the conditions of these three factors should be changed. Thus, effective implementation is possible if and only if there is change in curriculum materials (syllabi, textbook, teachers' guides etc), teaching practice, organizational structure and belief or understanding about the curricula and learning practice. In supporting these ideas Fullan and Promfret (1977:361-365), in their review of educational researches, conceptualize that a curriculum change consists of primary of five dimensions: change in a) all subject

view to bring about behavioral change in the learners so that the objectives of education in general and the aims of schooling in particular could be met. To do this, the curriculum must be implemented.

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matter or materials b) organizational structure c) role/behavior d) knowledge and understanding, and e) value internalization-all of these vis-à-vis a particular innovative idea or development.

Subject matter components refer to the content of the curriculum that the teacher is expected to transmit to students or that students are expected to acquire on their own or in cooperation with their peers, and to the transmitting medium. Therefore, curriculum development efforts typically revolve around decisions concerning what subject matter to include, in what order to present it and what medium to use.

Structural alternations involve changes in formal arrangements and physical conditions: different ways of grouping students, the presence of personnel to perform new role, and adequate supply of new materials. Thus, structural alternations may be necessary to support users in their attempts to implements other aspects or an innovation they value, and the lack of certain structural changes may inhibit or be incompatible with implementation.

The behavioral manifestations or role relationships change concern new teaching styles, new role relationships between teachers and students, teachers and heads, teachers and supervisors, and so on.

The other dimension of the implementation concerns the knowledge and understanding that users have about the innovations' various components such as its philosophy, values, assumption, strategies and other organizational components.

The last, but not the least dimension concerns users' valuing of and commitment to implementing innovations' various components, such as the acceptance of and agreement of stakeholders with the philosophy, aims and objectives of the new curriculum. Neither of these measures reveals what exactly it is that people are valuing or even whether they all have the same perceptions concerning what the innovation is.

Therefore, for effective implementation of innovation, making aware of clear intentions of the change among stakeholders, and in service training for

implementers, and the provision of materials, appropriate time and facilities during implementation are pre requisites.

Another important factor that determines the effectiveness of curriculum implementation at school level is related to its approach. Accordingly, Snyder et al (1996:402- 410) suggest, there are three perspectives with regards to implementation approaches of a program: fidelity perspective, mutual adaptation and curriculum enactment. These approaches are categorized and summarized based on their assumption, knowledge, role of teachers and concept of evaluation in curriculum implementation as follow:

Aspect	**Fidelity**	**Mutual adaptation**	**Curr. enactment**
Assumption	The intended curriculum must be implemented as the implementers plan it.	Since ideality and realty don't match, some modification or adaptation may require by the user of the planned curriculum.	Teachers and students in the classroom jointly develop learning experiences.
Knowledge	Curriculum experts are the source of knowledge for their students.	Local context guided by experts are source of knowledge for students and teachers.	Students and teachers with in the classroom construct it.
Role of teacher	Only transmitter of the planned curriculum in the class	Actively participate to adapt the planned curriculum to local context.	Developer and implementer of the curriculum with his students.
Evaluation techniques	By comparing and contrasting the stated objectives with observed achievement	By considering the planned and the unplanned objectives/ learning experiences during implementation for the achievement of students.	By describe and understand the meaning given to the prepared curriculum by students and teachers.

Source: Adapted from Snyder et al (1996: 414-428)

The above table shows that the existent of different approaches to the development as well as implementation of curriculum materials. Their differences start from their assumption and foundation of knowledge about what a school curriculum is.

Therefore, studying of curriculum implementation at school level is important for reasons of identifying whether the planned curriculum is materialized as it is intended or not. In this regard Fullan and Promfret (1977:335-339) after reviewing the work of researchers on curriculum implementation have identified the following four main reasons for the need to study curriculum implementation.

- To know what has changed it must be conceptualized and measured directly.
- To understand why so many proposed educational changes fail, and identify the most problematic aspects to bring about change.
- To be aware of activities of the implementers whether they are in line with the requirements of the program, and
- To see what determines the implementation of a curriculum, or in short, to interpret learning outcomes and relate them to possible determinants.

Thus, this study intended to evaluate the performance of mission owned schools whether they are in line with education and training policy of the country or not which share the same concept with Fullan and Promfret (1977).

2.3 The Status of Curriculum Implementation in Ethiopia.

In 1994, Ethiopia had undergone political system change and consequently educational innovations including curriculum issues. The new education and training policy of Ethiopia TGE(1994) state innovations in different aspects of education sectors such as-change in: objectives, contents, evaluation techniques, roles of students or /and teacher, structural change, medium of instruction the use of new technology in schools, participation of stakeholders and many more.

However, emphasizing the nature of curriculum implementation in developing countries Dereje cited in IER (2002:9) noted that curriculum implementation is a

formidable and complex task in most countries where planning and leadership capabilities are at the lowest stage. As part of developing countries, African countries in general and Ethiopia in particular share similar educational challenges.

Similarly, recent research outputs indicate that implementation of the intended curriculum is in challenge due to a number of unsolved difficulties in Ethiopia. For instance, educational researches made in governmental schools by student - researcher of AAU: Alemayehu (2005) in the study of evaluation of teachers performance in implementing geography curriculum in Gore secondary school; Akaleweld (2001) in the study of the nature and purpose of practical one in the science curriculum materials in Addis Ababa; Solomon (2000) in the study of an evaluation of implementation of grade 8 mathematics syllabus in Sidama zone and Dawit (1999) in the study of an evaluation of 7th grade English syllabus in east Gojam, all these demonstrated in their specific site of research that there was a prevalent gap between the 'intended' and 'observed' curriculum at school level : teachers are still following the traditional procedures of talk and chalk-lecture instead of adopting of new curriculum-learner centered /problem-solving. The curriculum documents were found not manageable for teachers, time was scarce to cover contents, lack of teaching materials, large class sizes, and teacher incompetence and structural problems in the school etc were among major problems in implementations of the intended curriculum in this country.

Therefore, to have more effective implementation of the curriculum in the country for better success and for altering of such desperate situation of teaching-learning requires the commitment of all bodies accountable for the success of education and hence for the development of this nation. The time is still not late for making of necessary adjustments in line with country's politics, economic, social and others situations required for effective implementation of the curriculum documents.

2.4 Evaluation of Curriculum Implementation

Once curriculum is implemented at the school level, it is obvious that need arises to evaluate the successes and challenges of the planned curriculum for improvement or change. So that strength and weakness, the consistency between actual practices and intended purpose should be thoroughly studied. Indeed, there are many curriculum claims every time in human development that, continuous evaluation and refinement of the curriculum and its implementation is a demanding task.

Several scholars/educators like Patton (1997:203), Madous et al. (1983:129), McCormick and James (1983: 231), Pratt (1980:409-420) and others have put forth their conceptions on the contribution of evaluation in the field of education as follows:

- Help in planning process what to do next, to provide and account of what is happening.
- Enable to control the quality of education in general and particularly the curriculum by identifying and detecting problems during implementation.
- Enable to identify or predict in process, defects in procedural design or its implementation.
- Help decision makers to identify how far the ideal the program deviates; and support and organization in achieving its goals.

Therefore, it would seem preferable to reserve the term educational evaluation for application of different techniques to look the effectiveness of programs, curricula and organizational variables.

Several educators have put the definition and concept of curriculum implementation evaluation forth. For instance, Scriven as cited in Ornstein and Hunkins (1998:320-322) stated that curriculum implementation evaluation deals with the question of whether what is planned in curriculum documents put into action or use, to what extent the intended plan is translated into work. Similarly, Sayler et al. (1981:327) indicated that the significant role of curriculum

implementation evaluation is primarily determining the value of curriculum. Curriculum implementation evaluation is concerned with investigating whether the planned curriculum is fulfilling its purpose and the appropriateness of the contents and instructional materials for the purpose aimed. Likewise, McCormick and James (1983:190-201) consider curriculum implementation evaluation as a very important issue for educators or decision makers since the information gathered during evaluation enables the curriculum experts to check their programs and roles in line with the stated goals.

Therefore, curriculum implementation evaluation can be considered as evaluating the merits of all the administrative arrangements, practices, and the structures with in which educational institution it operates. The process of generating data which is used in assigning value to something and finally making a decision, either to accept, improve or reject it. These enable evaluators to consider all data related to the program implementation, interested in gaining greater understanding of the relationship between organizational forms and multiplicity of classroom transactions that they generate.

In theoretical positions, educators have proposed different alternative models as focal point to evaluate implementation of a curriculum. Differences are also observable among those advocating the product oriented, on the other extreme process oriented and in between this range there are also process- product oriented models.

The traditional- goal driven model, attributed to Tyler's model (1949) in Stenhouse (1975:176) focus on pre-specified curriculum or program objectives, relies on tests to quantify these objectives and aspired to rigorous experimental designs to determine their attainment. In a sense it introduces a criteria referenced model. In short the Tyler's model of curriculum evaluation is extended by Bloom (1956) and Cronbach (1963) as cited both in Saylor et al. (1980: 204-212) to examine the actual learner outcomes against the educational objectives.

In contrast to this model, proponents of naturalistic approach like Patton (1980:216) and Popham cited both in Madous et al. (1983:27-36) develop non-criteria referenced models or process models. In these models, the program goals

and even research questions emerge in the course of the evaluator's immersion or the program's operations. Narrative descriptions, rather than prescription are likely to from a major part of data collected, although objective tests and other more readily quantifiable data may be used.

In between these two models or perspectives, there is a third evaluation approach of curriculum implementation which is called process-product model. This model is developed by Stufflebeam – CIPP model in Ornstein and Hunkins (1998:124) and Stake congruence – contingency model in McCormick and James (1983:178). In some sense, these models are intermediate between the quantitative and naturalistic approach that advocate pragmatic approach. It places substantial emphasis on the quantitative methods and strong designs where feasible, but also stresses the importance of process and contextual data. They attend to a program's stated goals but also advocate the examination of other significant outcomes that might plausibly be affected for better or for worse, by the curriculum or program implementation.

Generally, as literatures depicts, there was clearly a need for evaluation models that went well-beyond collection of objectives test data and comparisons of measured outcomes to the stated outcomes or goals. In this regard, Conglosi, N. (1991:10-12) stresses, the fact that school are established to serve students, students achievement is the goal of instruction, therefore, lessons should be accountable for students achievements. Safely convincing an educational activity not led by goals or objectives might be anonymous with gambling, relying on chance. It is also, when outcomes are evaluated without the knowledge of processes, there is less probability for the results to provide a direction for action, as no information is obtainable regarding what produced the observed outcomes.

2.5 Factors affecting curriculum implementation

Fullan (2001:70-72) assert:

> "Educational innovation is not a simple event; rather it is changing process which involves new ideas and practices. The process of initiating these new ideas and practices can be affected by many variables."

For him the source of most problems or factors affecting the realization or implementation is usually lack of emphasis given to implementation by policy makers. Regarding this, after reviewing a number of studies that have examined curriculum !mplementation as a change process, Fullan in the (1991:211) and also in (2001:106) has indicated three major factors which facilitate or hinder the implementation of curriculum i.e. characteristics of change, local characteristic and external factors.

Accordingly, the characteristics of change refer the nature of the program or curriculums that are going to implement at the school or classroom level. It hinders or facilitates the process in terms of need, clarity, complexity and quality about the goals and means for different stakeholders of the education sector.

The local factors refer for Fullan, the social conditions of the change or the organizational setting in which the district, community, principals, students and teachers work and the planned or unplanned activities that influence whether or not given change attempts will be effectives. The need, involvement and cooperation of these bodies may facilitate or hinder the implementation of curriculums at the school level.

The last set of factors he suggest, the external factors refers the contribution of governments and other partner agencies in implementation process through allocating resource, supporting professional development, monitoring the policies develop standards for school and more others. These variables also determine the success of schools in implementing the curriculum materials. Pratt (1980:426-434) on his part identified barriers in curriculum implementation as: absence of motivation by people, inadequate resources, lack of clarifies about change and rewards to the success. Similarly, Goodland (1984:168-175) indicated that there is no single variable to limit curriculum implementation. One program in a given school may be effectively implemented; on the other hand, the same program may not be successfully implemented in another school. He argues that success or challenge of curriculum implementation may depend on the circumstances under which teaching–learning occurs such as facilities and resources availability,

institutional characteristics, interaction pattern of the people in the environment, etc. are some of factors the determine the extent of curriculum implementation.

Thus, scholars like Fullan (2001), Ornstein and Hunkins (1998), Goodland (1984), Pratt (1980) and others in their respective literature forwarded a number of factors that determine the implementation of curriculum at the school level depending on the circumstance of their study. For the conception of this study – they are categories into three: human resources related factors, material resources related factors and institutional related factors. Each of these is demonstrated below as subtopic.

2.5.1 Human resource related factors

To start with, curriculum development process that extends from planning to evaluation through implementation stage is affected by varies parameters. Throughout all these stages the involvement of human resources is essential. The responsibilities and duties of these personnel range from decision-making to implementing the curriculum materials at the classroom level. In this connection, Edmonds (1981:86) state in order to have effective program at the school level, different inputs should be available and utilized for the success of the program. Out of these inputs, human resource is one and the most to bring the intended outcomes. In other words, without the involvement of personnel (human resources) there is nothing to be done with the program.

In curriculum implementation process, teachers and principals are taken as front agent among human resource inputs. Educators like Pratt (1980:362) write, teachers and principals are by far the most important ones who determine the success of curriculum implementation in the school. Students' achievement would not be attained unless the appropriate human resource are made available and utilize in the school. Similarly, Sarson in Orenstein and Hunkins (1998:190) assert, the realization of the planned curriculum need the engagement of people, however, the attitude, skill and knowledge of teachers and principals highly determine its achievement. In short, it is common belief that success of implementation depends largely on the philosophy, role and qualification of human resources available at different level.

A) The Principals

The role of principals in curriculum implementation is demonstrated by a number of educators. This is because; the inputs (students, teachers, parents, materials etc) of a school need high management and coordination skill from the principal to attain the intended objectives. For instance, Fullan (2001:83) noted in his word:

> "The principal is the person most likely to be in a position to shape the organizational conditions necessary for success, such as the development of shared goals, collaborative work, structures and climates, and procedures for monitoring results."

Shiundu and Omulando (1992:234-238) on their part express, the job of principals is primary about enhancing the skills and knowledge of people in the organization, creating a common culture of expectation around the use of those skills and knowledge, holding the various pieces of the organization together in individuals accountable for their contribution to the collective results. In similar fashion, Pratt (1980:262) writes, the school principals are educational leaders who promote the success of all students by ensuring management of the organization, operation, and resources for efficient and effective learning environment.

Hence, according to Pratt, the effectiveness of the principal in education activities in general and particularly in implementing the curriculum materials is measured in terms fostering of the conditions for school improvement by helping to obtain and utilize resources, developing collaborative culture across subgroups, supporting teachers development, creating facilitative structures and monitoring teachers commitment as an indicator of organizations capacity.

On the other aspect, the intimate relation between the principal and teacher is one important factor for effective implementation. In this regard, McLaughlin and Talbet (2001:120) noted, teachers need support form principals of the school. The support may be professional, technical, moral/psychological and materials. Little cited in Fullan (2001:85) describe, teachers and administrators frequently observe each other in their work, and provide each other with useful evaluations of their effectiveness. Only such observation and feedback can provide shared

goals of the school. They (teacher and principal] plan, design, research, evaluate and prepare teaching materials together. These can lead for long term improvements and make rising standards for their work attainable by them and by their students. Moreover, MOE (2002: 27-32) in policy guideline indicated the role of principals in the school is supporting teachers for their performance by:

- Providing teachers with clear a picture of his new role requirements.
- Providing the teacher with the necessary retraining experiences to develop their capacities for coping with difficulties of implementing the innovation.
- Using their experience and training, contribute to the betterment of the education system.
- And, providing direction and guidance, as well as keeping channels of communication within the school organization and between the school and the community.

Generally, in theoretical position, the principal of the school has a prominent position in translating the intended curriculum into practice. His successes lead to high expectation of students' achievement. That is, the principal roles in curriculum implementation are facilitator, initiator, coordinator, and supporter of the whole teaching learning process in the school by focusing on students learning.

B) The Teacher

Teachers like principals, of all categories and levels have a major role in implementing the curriculum. More than ever, as Fullan (2001:237-246), Aggrawal (1997:312), Gagne et al. (1992:32-33) and Edmonds (1981:41) have demonstrated it as teachers are engaged more and more today in the implementation of curriculum with the use of new educational techniques and methods. The role of teachers is no longer limited to instruction only, teachers, apart from their instructional duties have now to assume more responsibilities in collaboration with other educational agents for preparation of the young for community life, productive activities and so on.

As convincingly put by these authors, in order to have effective implementation of curriculum materials, teachers must know enough about the innovation, subject matter, method of teaching, the learner, and the setting for learning environment. The teacher must know the facts, concepts, basic ideas, and generalization underlying his subject and at the same time in a position to identify the relationships between his subjects and that of others so as to recognize organizational principle involved. Obviously, the knowledge of teacher about these variables may have a positive consequence for effective curriculum implementation.

Teachers, as noted earlier, are generally backbone of the whole education program and particularly the curriculum implementation. For example, according to Shiundu and Omulando (1992:215), the teachers need to perceive that the new system will work in their environment. Teachers are often doubtful of new approaches, and it is time consuming to switch to new curricula and materials. Accordingly, teachers must approach the task with a positive attitude towards the new system.

The quality of working relationships among teachers is strongly related to implementation. In this regard, Fullan (2001:84) writes that collegiality, open communication, trust, support and help, learning on job and getting result are closely interrelated. Teachers talk about teaching practice with their peers, students, parents and principals build up a shared language adequate to the complexity of implementation, capable of distinguishing one practice and its virtue from another. Similarly, interaction with other influences what one does, relationships with other teachers is a critical variable. Since change involves learning to do something new and interaction is the primary basis for social learning. New meaning, new behaviors, new skills, and new beliefs depend significantly on whether teachers are working as isolated individuals or are exchanging ideas, supports and positive feeling about their work with others.

To sum up, the above authors clearly shows that teacher competence -what he knows and can do –affect all the core tasks of teaching. What teachers understand about content and students, for example, shape how they select from

texts and other materials and how is effectively they present material in class. Teachers' skill in assessing their students' progress also depends on how deeply teachers' know the content and how well they understand. His knowledge, beliefs, competence and relationships with others agents determine the success of implementation. In short, the accumulation of the activities of teachers' and their aggregate effect determine the extent to which students achieve the planned objectives.

2.5.2 Material resource related factors

The success of curriculum implementation requires appropriate and adequate material resources. This means, material resource is one factor to determine the successfulness of implementing an innovation. Material resources may include curriculum materials, instructional facilities, infrastructure facilities, technological facilities, equipments, tools and so on. These are ingredient for teaching - learning activities and the intended curriculum cannot be easily implemented without these inputs.

The availability and utility of these material facilities, as asserted by many scholars, correlate with positive student gains and effective curriculum implementation. To this end, Kinder (1995:63) assert that teaching materials are devices, which can be used to make learning experience more concrete, more realistic and more dynamic. Similarly Girma in IER (2002:32-36) denotes, in order to implement a program, it should be design in such a way that under favorable conditions certain intended learning outcomes will emerge. Out of favorable conditions teaching materials is one factor. In other words, school facilities are militating factor against successful implementation of any program. Meaning, it is one thing to design a program, it is quite a different matter to make it work. To make it work the availability of materials (school facilities, laboratories, libraries, classrooms, sport fields, entertainment areas and so on) are necessary conditions.

Accordingly, the Education and Training Policy of Ethiopia TGE (1994:14) stated that:

> "..to promote the quality, relevance and expansion of education due attention would be given to the supply, distribution and utilization of educational materials, technologies and facilities."

This indicates that the policy has given due attention to the importance of teaching materials as a component parts of the effort towards up-grading the quality of education in the country.

However, some research outputs comment that the availability and use of instructional materials in developing countries is not convincing. For example, UNESCO (1999) in the study of Sub Sahara African education demonstrated that there is prevalent gap between the intended and observed curriculum. This gap is due to lack of textbooks, teaching materials, and teachers' guides, and by the lack of proper equipment and facilities such as furniture, drinking water and sport facilities.

Thus as part of developing countries Ethiopia also share this problem. Studies made by Dereje (2002:28-32) and Dirbssa (2002:80-98) both in IER indicated that the full and effective implementation of the curriculum was hampered by shortage and lack of instruction facilities. These studies implied that schools are in problems due many interrelated variables: the procurement of poor quality of equipment and materials, technical defects in design, error in installation and inappropriateness of imported equipment and materials to local conditions or inappropriate technology that doesn't fit to a particular situation of the locality.

Among instructional facilities curriculum materials: textbooks, syllabus, and teachers guides are important inputs. The word of Lock et al (1991:39-46) witnesses this when he notes

> "Textbooks as delivers curriculum, is the single most important thing in instructional activities... nothing has ever replaced the printed words as the element in educational process."

We can gain some evidence from this statement that curriculum materials determine to a very large extent the nature of the experiences that students have in the school.

To sum up, the availability, relevancy and utility of material resources: curriculum materials, infrastructural facilities and instructional facilities in the school environment determine the extent to which the planned curriculum is materialized successfully or not and hence students' achievement.

2.5.3 Organizational related factors

Organization related factors are also equally important as human and material resources in determining the success of curriculum implementation in the school. Many investigations have shown the dimension of organization in determining the effective implementation of innovations. For instance, Scheerens and Bosker (1997:116-134) after studying a wide variety of school reform in USA, came up with six essential characteristics of successful school: focus on students' achievements, parental involvement, favorable school environment, strong leadership, cooperative working culture, and time on task.

Similarly, Edmonds (1981:69-142) created what he called "Effective School Model". That noted five characteristics of successful schools: strong administrative leadership, culture of cooperation, high commitment for students' success, frequently monitoring of students performance, and safe and orderly school environments.

More than these studies, MOE in its Sector Development Program- ESDP II (2001:25) stress, educational quality doesn't depend only on inputs such as infrastructure, human resources, or on curriculum content alone. Therefore, more attention should be paid to education process- how teachers and administrators use inputs to frame meaningful learning experiences for students. Thus, school efficiency; teacher's competence, relevant on-going professional development, continuous support for schools, teachers' working condition and supervision are to be strengthened in the schools.

Here, it is clear from the above literatures that leadership style of schools, community /parents involvement in education, communication culture of the school people, professional development for teachers and principals and the physical environment of school system as a whole are considered as determinates of implementations of a program at the school level.

To be effective school (as an organization), need to have administrative structure in which there is a clear role relationship of inputs of the school. The structure of the school has to facilitate and coordinate the availability and utilization of human and materials resources. In this regarded, Elmore in Fullan (2001:149) states, the job of structure in the school is primarily enhancing the skill and knowledge of people of organization, coordinating the various pieces of organization for productive relationships with each other and holding individual accountable for their contributions to the collective result. Similarly, McNeil (1990:266) described that, educational organization and management needs to formulate structure; the task of different levels, determine the role relationship, and it also include arrangement of the manpower, finance and materials for the implementation of curriculum. Hence, it is clear that without administrative structure of school, performing of activities for the intended goal of education is difficult task.

There is consistent evidence that shows parents' encouragement, activities, interest and participation at the school affect the children's achievements. Evident that Dereje in IER (2002:41) state, in order to consolidate and deepen positive developments in a context of limited economic, financial and human resources, it is very important to use parents and communities as resource. Parents and communities can play a substantial role in tackling challenges faced while implementation. Likewise, the MOE in its Sector Development Program – ESDP III (2006:36) stress, the government's role in facilitating partnership at all level with civil society, parents, communities and teachers' associations. It emphasized that such partnership is not limited to cost- sharing, but their involvements in the whole education process, including decision- making, management and teaching. Thus, successful implementation of curriculum

requires the participation efforts of parents in school activities for achievement of students.

On the other hand, the communication culture of school communities-parents, principals, students and so on influence curriculum implementation. In this regard Amare (1999:56) stated that the greater quality and quantity of sustained communication channel through interaction among people involved in curricula activities, the greater the degree of implementation. Similarly, Fullan (1991:67-73) indicated that to raise the quality of teaching within the classroom, demand effective culture of communication. The culture leads teachers to work together, sharing what they learn in their classrooms, to help one another and even to learn more. In addition to these, Snyder et al (1996:416) noted that student's communication with teachers, principals, parents and their peers about school increase confidence in the ability to do the work, valuing the importance school for their future. Hence, the most effective interaction among school members (students, teachers, principals, parent etc), the greater degree of effective curriculum implementation.

The other aspect of organization aspect influencing curriculum implementation is the trend of professional development for teaching staff. According to McNeil (1990:223), now staff development through workshops, seminars or short-term training is the central focus in successful curriculum implementation. To him, if we want effective school, we must make it possible for teaching staff (teachers and principals) to develop their capacity to do the job, and it is more important in persuading them to implement the curriculum. By the same token, Fullan (2001:265) and Edmonds (1981:161) indicated that more than any thing, professional development makes huge demands on teachers' own learning – learning how to integrate new material or technology into their classroom, and learning how to interact effectively with others. Thus, through in service training programs for teachers it is entails that teacher know enough about curriculum, subject matter, method of teaching, the learner and his environment, and interaction ways. Obviously the knowledge of these variables with others variables have a positive role in curriculum implementation.

Therefore, it is evident from the above discussions that the nature and type of school structure, participation of parents and communities, nature of communication channels and staff development programs of the school are organizational factors that facilitate or hinder curriculum implementation in school system.

2.6 The science curriculums of general secondary schools of Ethiopia.

As Richardson and Bernard (1987:2-6)

> "Science as a school subject should be far more than description and history. Science is a way of thinking and acting-in the school and out. To produce this impact, school science subject should provide experience far beyond recapitulation of facts and principles."

This implies that learning science as a series of subjects (biology, chemistry, physics or environment science) can bring about awareness and growth in scientific and technological thoughts and activities. It also underlines the central role of science knowledge is solving of individual or social problems through scientific approaches. Therefore, the science curriculum development, implementation and evaluation in the schools requires due attention on the part of teachers, principals, communities, students, researchers and policy makers at large.

Jenkins (2003:10) describe that attention should be given to secondary science curriculum that are common to all education systems and directed towards the broadly common aim of promoting scientific and technological literacy. According to him, scientific literacy is seen as essential in:

- laying the foundation of wider public understanding of science and technology.
- enabling individuals to function effectively in an increasingly scientific and technological world; including in relation to their health, well being and employment.
- and, educating the workforce necessary for the economic and social development.

Pomeroy (1994:24) also noted that secondary science curriculums must be developed based on the extent of these ends: the growth of individuals for enlightenments and effective living; the creation of a world in which all persons strives to understand each other and also properly utilizing biological and physical environments.

Similarly, Ethiopian policy makers and curriculum developer differentiated the purposes of secondary science subjects in the respective curriculum guides. According to EMPDA curricula (1989), science courses offered in secondary schools are commonly seen as broadly supporting policy objectives of the country that are essential for economic, social and political affairs of the society. Thus, these subjects in general aimed at preparing both a body of future scientists who can play key role in the national development and in having broader purpose of developing scientifically literate citizens. In order to achieve these general objectives, according to the document, they are designed to help students in acquiring: a thorough foundation of knowledge, practical skill in application of knowledge and conviction of the value. Therefore, science is thought in secondary schools today because of the recognized need for general scientific literacy, our dependence up on scientist have been placed upon critical taught of science course and for proper utilization of resources from our environment.

To achieve such objectives of science subjects, the teaching methods of these subjects are important. In this regard, Comber and Keeves (1983:169) assert, the history of science education has replete with referent to different approaches with terms such as teaching science by investigation, project work, problem solving, learning by doing and rote learning being common place. For Comber et al, the extent to which such terms are accurate reflection their subjects in the school are, of course is highly problematic. The study made by Pomeroy (1994:64), recommended methods of teaching science subjects as: the approaches to teach science subjects for students must relate the local practice to the theoretical aspects. That is, students will more likely to see sciences as a less alien pursuit if they can suite it in the context of their lives.

In the same fashion, the curriculum guides of Ethiopian Secondary School Education recommended pedagogic strategies for implementing the curriculum. The materials suggested a variety of teaching methods such as lecturing, discussion, demonstration, inquiry method, discovery method etc to achieve the curriculum objectives. Hence, the direction of learning experiences in science curriculum need an effort to use a variety of teaching methods to bring with the real life situations.

The facilities of school need to be adequately available and utilized to support the demands of school curriculum in general, but as with the practical teaching of science subjects. In this regard, Jenkins (2003:121) describe, there is no doubt about the need of material and facilities- laboratories, libraries, ICT, equipments, tools, etc for implementation of science curriculum. This is because the practical work of science subjects has been expected to use facilities and materials to effect such a broad range of different learning outcomes, including cognitive, affective and manipulative.

According to Jenkins (2003:130), Bekalo and Welford (2000:102) and Richardson et al (1987:70) the purposes of practical activities of science typically are:

- Promoting simple scientific methods of taught.
- Encouraging accurate observation and careful recording.
- Developing manipulative and problem solving skills.
- Demonstrating facts and principles.
- Helping students in understanding more theoretical aspects of science.
- Arousing and maintaining interest in science.
- And, developing competence at carrying out scientific investigations.

In addition to these facilities and materials for effective science curriculum implementation, there seems little reason to doubt that contemporary information and communication technologies (ICT) can make significant differences to the quality of teaching science subjects. In this regard again Jenkins (2003:164) and

Richardson et al (1987:263) noted that making effective use of ICT in teaching science requires the way teachers are use it as a resource to achieve the learning outcomes. These authors also put their conceptions about the use of ICT facilities and materials in school system as:

- Having global or national access of scientific information, teaching materials and resources.
- Communicate rapidly with teachers or /and students in other parts of the world and engage in conversation about difficulty in teaching learning of subjects.
- Access the catalogues of major libraries indifferent areas.
- And, undertake professional development.

Hence, that is why the MOE in its Sector Development Program- ESDP II (2001:45) planned to have more facilities and materials in secondary schools of Ethiopia– library, laboratories, entertainment areas, and ICT for implementation of the intended curriculum in general and particularly for science subjects.

In conclusion, the curriculum of science subjects for secondary schools are stated the objectives, strategies and assessment methods of students achievement. The success of science curriculum implementation, as any other subjects are strongly influenced by what has to be taught, by the resource available, by teacher's own academic and professional background, and by wider cultural and social norms. It follows that any reform in curriculum must address these various elements in a coherent and integrated way.

CHAPTER THREE
METHODS AND PROCEDURES OF THE STUDY

3.1 Design of the study

The major concern of this study is evaluating how missionary owned secondary schools implement the science curricula vis-à-vis the Education and Training Policy of Ethiopia. Specifically, identifying the successes and/or challenges mission schools came across in implementing the science curricula of grade 9 and 10. According to Creswell (2003:128), mixed research design (both quantitative and qualitative) can be used for educational evaluative study.

Thus, in line with this statement and the purpose of the research, the present study employed multi-method research design (both quantitative and qualitative methods). The qualitative approach employed in this study is an inquire process aimed at understanding the phenomenon under the study and reporting of the detailed views of the respondents. While the quantitative approach employed is survey method aimed at measuring variable in number in order to determine their strength with other variables being tested. Evidence (Creswell, 2003; Olusegun, 2001:1-10) abound that the use of a combination of both qualitative and quantitative research methods results in strong validity to outcomes.

3.2 Model used in the study

From among the various kinds of models suggested by educators, Stake's Congruence – Contingence evaluation model is found to be the most appropriate model that can suit for this study. In using of the model, the information obtained is analyzed in terms of the match and mismatch between what is intended and what is observed. The model is selected mainly because it gives due consideration for the input, process and product aspects of educational activities that are also the concern of the present study.

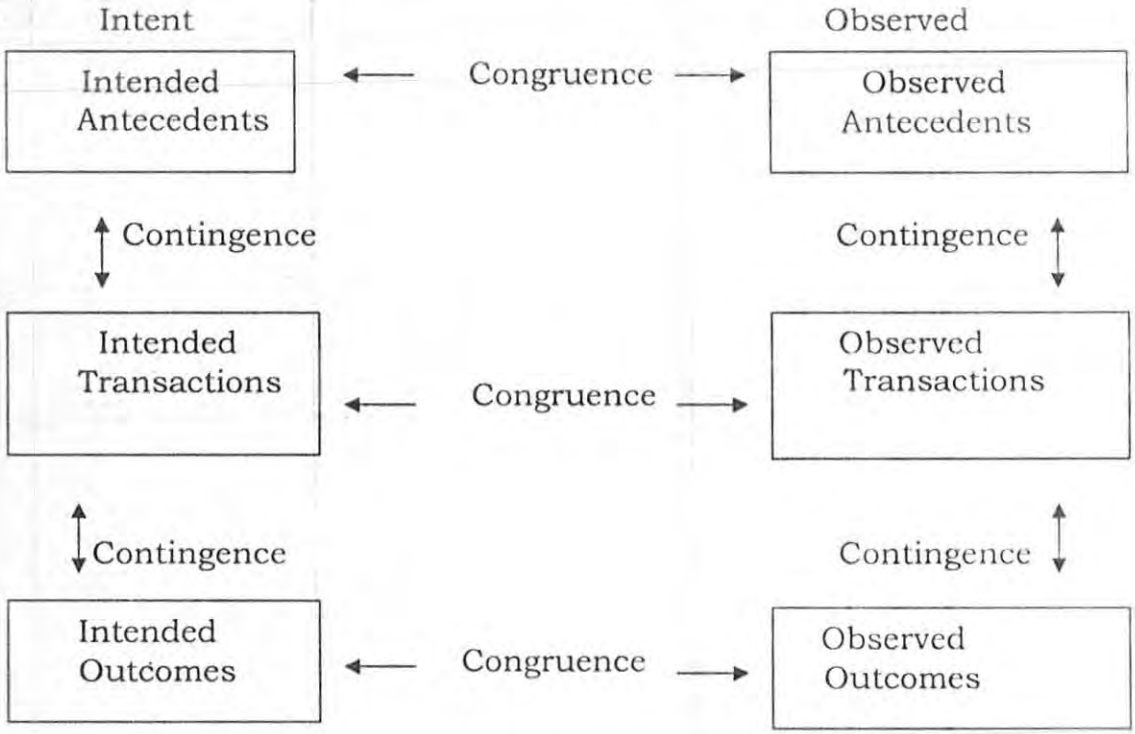

Fig 3.1 Stake's Congruence – Contingence Evaluation Model

(Stake, 1967: in McCormick and James, 1983: 178)

Accordingly,

1. An "antecedent" is any condition existing prior to teaching and learning activities, which may be related to outcomes. There are several inputs of particular innovation such as change agent characteristics, the existence or absence of instructional resources in the schools, school organization, parental involvement, community context etc. However, school physical facilities, curricular and instructional facilities and the kind of support provided for teachers, principals and students are offered as an antecedent (input) for this study.

2. "Transactions" are countless encounters of students with teachers, teachers with principals, students with students, author with readers, educational personnel with members of the community etc. However, in this study teachers and principals performance as prescribed in policy guidelines, communication channel existing among school communities (teachers, students and principals) are taken as transaction variables to be evaluated.

3. "Outcomes" are variables such as students' achievements (cognitive, affective and psychomotor) as a result of the process, the effect of innovation on teachers and principal and vise verse. However, in this study student attitudes developed towards science subjects as result of the implementation process has taken to be evaluated.

3.3 Subjects and sampling procedures

The universe of this study includes all missionary owned secondary schools in East Shoa administrative Zone of Oromia Region. However, since it is difficult to consider all religion organizations owned secondary schools in the Zone because of time, budget, data management system and manpower, the target population is selected only from Catholic Church schools since this religion institute share large number of secondary schools in the Zone.

According to the statistical information obtained from East Shoa Zone Education office, a total of 9 (nine) missionary owned general secondary schools (grade 9 and 10) are functioning currently in 2006/7 academic year. Among them 5 (five) secondary schools are administered and financed by Ethiopian Catholic Church Secretariat. Of the five Catholic owned secondary schools, 3(three) schools were randomly selected for the present study. These are: Ziway Don Bosco Catholic Church School, Meki Catholic Church School and Nazerate St. Joseph Secondary School.

3.4 Data sources and sampling procedures

Three groups of people are used as source of data for this study. The first group consists of teachers who teach science subjects (Biology, Chemistry and Physics) to grade 9 and 10 in 2006/7 academic year. The second group comprised of grade 9 and 10 students. The third group comprised of principals of selected schools.

Accordingly, to ensure representation 140 students out of 560 students of grade 9 and 10 in the schools were selected by simple random sampling techniques. But, available sampling technique is employed to select all science teachers (14 in numbers) and all principals (3 in numbers) due their manageable size and their importance to the study.

In addition to these, official documents of MOE such as policy guidelines, sector strategic plans, syllabi, teachers guides and students textbooks of the respective subjects were used as a source of information in the study.

3.5 Data collection tools

Multiple instruments of data collection are used in this study. According to Creswell (2003:220-225), using more than one data collection techniques has an advantage to combine the strengths and minimize the weaknesses of any one source of data. In the same vein, Best et al. (1999:39) states that single study can use both quantitative and qualitative data tools. Bearing these ideas, the present investigation is conducted by using four types of instruments: interview, focus group discussion, observation and questionnaire.

A. Interview

Interview is a good tool to secure an in-depth data (Best et al., 1999:141). To obtain such an advantage the present research employed interview guides for the principals of selected schools.

Interview guides were first prepared in English and then translated into Amharic. Since taking notes alone are not sufficient in such cases, responses were tape – recorded. Prior to data collection, the student – researcher established rapport and informal relation with the respondents. These steps helped the interviewees to be relaxed and develop trust on the researcher. /see appendix A/

B. Focus group discussion

According to Creswell (2003:134) FGD is useful tool to understand issues with consensus and variation among members of the discussion, to obtain group attitudes and perceptions by initiating the participants for active discussion.

Based on these advantages and objectives of the study, that is, understanding of opinion of science subject teachers with regard to the current implementation trends in selected schools, the present study explored focus group discussion due to manageable size of science teachers in surveyed schools.

The study used this tool since it is necessary to have ideas about the successes and challenges of selected schools achieved and/or encountered in science

curriculum implementation activities from the point of views of teachers'. Beside, it is intended to have some points with regard to teacher's activities in the school as implementers. Hence, a total of three focus group discussions with science teachers in each of the selected school were used as a source of data for the present study. /see appendix B/

C. Observation

In order to evaluate the performance of selected schools in terms of translating the intended curriculum materials into practice, the present study employed observation techniques. Schools observation was made to evaluate whether the activities of teachers and principals in the school is in line with the prescribed duties and responsibilities or not, the availability, relevance and utilization of material resources in the school and the commitment of school as an organization to materialized the planned curriculum materials (policy guidelines, syllabi, teachers guide and textbooks) for the achievement of students.

Classroom observation also made to evaluate the performance of science teachers in their classroom activities and to assess the attitude of students towards learning of science subjects as a result of curriculum implementation practice. Four science classes were observed from each school by random sampling techniques. Hence, total of 18 science subject sessions or six sections for each subject (6 Biology, 6 Chemistry and 6 Physics) were observed to gather data for this study.

Both schools and classes observations were made by the student – researcher himself to have a better understanding on the information to be obtained. /see appendix C/

D. Questionnaires

Two sets of questionnaires are prepared to obtain information from teachers and students in the selected schools.

a) Teachers questionnaire

This set of questionnaire has two types of structure: closed and open-ended structures. It is prepared to acquire information about teachers' activities, availability and utility instructional and physical facilities, the communication channel existing among school communities, the support provided for teachers and problems encountered in the teaching - learning process. In general, the questionnaire is prepared to gather information from teachers' point of views with regard to the general trends of school in implementing the science curriculum. / see appendix D/

b) Students questionnaire

Along with the classroom observation, questionnaire for students is prepared to obtain information about students' attitudes towards science subjects learning, students' communication system with school communities (principal, teacher and peer) and the availability & utility of instructional and physical facilities for the teaching learning activities.

The questionnaire was prepared in English and then the items were translated into Amharic so as to avoid the students' misunderstanding of the items. The Amharic version was given to three graduate students of language department for further comments. Finally, the comments were used to increase the validity of questionnaire. /see appendix E/

3.6 Method of data analysis

Since the study explored multiple methods of data collections, the procedures followed for analyzing the data depend on the instruments employed. Thus, the present investigation employed both quantitative and qualitative methods of data analyses procedures because, the study intended to evaluate the match and mismatch between the 'intent' and the prevailing 'observed' teaching - learning practices of science subjects in missionaries owned secondary schools.

Quantitative data analysis method is used for analysis of those data obtained through questionnaires and observation notes that readily lead themselves to numerical presentation. That is, such data tallied and changed to scores in tables so that they can be described by statements.

In parallel with quantitative techniques of data analysis, qualitative data analysis also employed for analysis those data gathered from interview, observation and focus group discussion, which are less easily summarized in numerical form, but can be analyzed through narrative description and /or direct quotation of statement from the participants' opinions.

CHAPTER FOUR

DATA PRESENTATION, ANALYSIS AND INTERPRETATION

In this chapter the data collected through questionnaires, focus group discussions, interviews and observations are presented in quantitative and/or qualitative forms. The quantitative data are presented with the help of tables in numerical form followed by descriptive statements and the qualitative data are presented through narrations and/or direct quotations of informants' point of views.

Based on these data, analysis and interpretation are made to give answers for the research questions raised in the study.

4.1 Human resource related issues

4.1.1 Principals' performance in the school

As Fullan (2001:83) assert, the school principal is a person who most likely to be in a position to shape organizational conditions for successful implementation of the intended curriculum materials. The roles of principal in curriculum implementation are facilitator, leader, initiator, coordinator and supporter of the whole school activities by focusing on students learning.

In this study, the actual principal performance with respect to the prescribed duties and responsibilities are examined as perceived by teachers through questionnaires and focus group discussions. Simultaneously, principals were also observed whether they did their duties or tasks as suggested in curriculum documents or not. The data obtained through these tools are presented and analyzed as follow:

Table 1. Activities of principals' as perceived by science teachers

No	Activities	Rating Scale			Total
		Very Sufficient	Sufficient	Insufficient	
1	The extent to which the principal guides teachers for better achievement of their tasks (orienting duties and responsibilities for teachers).	3(21.4%)	6(42.9%)	5(35.7%)	N=14 100%)
2	The extent to which the principal provide professional supports for science teachers according to policy documents.	4(28.6%)	7(50%)	3(21.4%)	"
3	The extent to which the principal create cooperative learning environment among science teachers (coordinating skill).	0(0%)	4(28.6%)	10(71.4%)	"
4	The extent to which the principal supervises teachers while in their classroom instruction for feedback.	2(14.3%)	3(21.4%)	9(64.3%)	"
5	The extent to which the principal facilitate the utilization of school resources (material, time and finance) by science teachers for effective implementation of curriculums.	2(14.3%)	5(35.7%)	7(50.0%)	"

The extent to which the principals guide teachers through clarifying of their duties and responsibilities for the better achievement of their tasks is rated as insufficient by 35.7% of respondent teachers. The rest percentages (42.9% and 21.4%) of respondent teachers indicated that they received sufficient and very sufficient orientation about their tasks from directors respectively. Thus, according to these informant teachers, principals of surveyed schools orient or clarify the duties of teachers in the school in sufficient ways. This, as noted by

Schermerborn (1989:112), enables to bring about the congruence between organizational goals or expectations and teachers needs, but not guarantee alone.

Similarly, 21.4% of respondent teachers rated as insufficient about the professional support provided by their principal with regard to their activities in the school. But, 50% and 28.6 % respondent teachers indicated that they perform their tasks with the help of principals in sufficient and very sufficient way respectively. In the same vein, the majority of science teachers who participated in focus group discussions indicated that they accomplish their tasks in the classroom with the support they received from their respective principal.

Contrary to these data, majority (71.4%) of respondent teachers indicated that the coordinating skill of principals for mutual sharing of experiences and creating of cooperative working environment among science subject teachers is insufficient. The rest 28.6% of respondents rated that the coordinating skill of principals as sufficient, but there is no one who rated as very sufficient. It has been indicted in MOE (2002:32-39) policy guideline one of the responsibilities of school principal is creating of cooperative working environments. The performance of the surveyed schools principals in terms of creating cooperative working environment among science subject teachers is not congruence with the intent of policy. This result also fail to be in line with the view of Ornstein and Hunkins (1998:204), who view the competence of principal in creating conducive teaching-learning environment through collaborative work for mutual assistance within and beyond the schools would be important factor to support changes in the school system.

Table (1) also shows that majority of respondent teachers (64.3%) were not supervised by their principal while in the teaching-learning process. Only 21.4% and 14.3% of respondents indicated that they were supervised by their directors as sufficient and very sufficient respectively for feedback.

Moreover, half of respondent teachers (50%) rated that the performance of principals in facilitating the teaching-learning process through utilization of school resources for effective curriculum implementation practices as insufficient. Only 14.3% of respondent teachers' rated as very sufficient. That is, principals of surveyed schools are not be able to facilitate the utilization of school resources as expected by science teachers.

Besides the table (1) data, informant teachers who participated in focus group discussion indicated that the performances of principals in their respective school are not promising as stated in the policy guidelines of MOE (2002). According to these informants, this is due to the fact that the person who are assigned as principal doesn't have full autonomous (authority and power) for leading of school as an organization. They also discussed that though the principals have the knowledge, skills and attitudes of coordinating, leading, facilitating and supporting the teaching – learning process in the school, they are not able to utilize all of their talents for the success of the school. According to the informant teachers, the inability of the principals to achieve the intent is due to the fact that the management structures of the surveyed schools don't allow principals to perform their tasks as expected. In this regard, one of science department head and biology teacher assert:

> "... We [teachers] frequently discuss with the director about factors that hinder the effective implementation of syllabi in the school. Though the director is committed to the problems, he can not be able to solve all problems. Since he has no full authority in the school resources particularly in material and finance resources which are under the control of the head of the church who are not an academician or professional". /Apr. 13, 2007/

In the same vein, one of the interviewed principal asserts in this regard as:

> "As director of the school I have tried my best to lead the teaching learning process in the school through orienting tasks for teachers, solving problems with teachers, supporting teachers and students to achieve the intended objectives...here I don't want to tell you false statements by saying, my activities in the school are as expected from the position." /Apr. 8, 2007/

Observation notes are also indicated that though the directors are committed for their position which is expressed by their readiness, willingness and attention given to their students' achievement. They are not able to utilize the school resources as required for effective implementation of the curriculum documents, particularly those of science curriculum. Hence, in this respective, the responses of informants seem to be real and practically faced problems. In this regard, Pratt (1980:275) noted that school principal without power and authority could not be able to bring effective and sustainable change in the teaching-learning process of schools.

In general, the above data show that the principals of surveyed schools attempted to perform their tasks in the school for successful implementation of curriculum materials. However, their activities are limited on certain aspects such as guiding and supporting of teachers or solving some of problems arises in the teaching learning process with teachers. Hence, principals' activities in surveyed schools are not sufficiently congruence with the statements of the policy guideline of MOE (2002).

4.1.2 Teachers' performance in the school

A teacher is one who translates the intension framed in the curriculum into action through multitude of activities that occur both inside and outside the classroom. The accumulation of these activities of teachers and their aggregate results determine the extent to which the planned objectives are achieved by students or not. In this regard, Shiundu and Omulando (1992:215) stated that the extent to which a curriculum is implemented as planned depends up on the extent to which teachers are competent to perform it in the school.

Thus, teachers' performance in the school is an index to judge whether the implementation practice is effective or not.

Table 2. Teachers' performance as perceived by students'.

No	Activities	Rating Scale			Total
		Frequently	Rarely	Not at all	
1	The extent to which science teachers utilize different methods of teaching (lecture, discussion, demonstration, laboratory work, etc).	17(12.1%)	64(45.7%)	59(42.1%)	N=140 (100%)
2	The extent to which science teachers guide students to observe and discover rules and generalization by themselves.	11(7.9%)	30(21.4%)	99(70.7%)	"
3	The extent to which science teachers relate their lesson to students real – life situations.	17(12.1%)	56(40.0%)	67(47.9%)	"
4	The extent to which science teachers use different assessment techniques to check student's understandings (oral, homework, class work, exams etc).	48(34.3%)	59(42.1%)	33(23.6%)	"
5	The extent to which science teachers are available and willing to provide additional assistance to students in relation to their subjects (study time or make up classes).	85(60.7%)	42(30.0%)	13(9.3%)	"

The above data depict that only 12.1% of respondent students rated as frequently the practice of their science teachers to utilize different prescribed teaching methods in the syllabi. But, majority of respondent students (45.7% and 42.1%) rated as rarely and totally absence of such practice respectively. Beside,

the table also shows that only 7.9% of respondent students indicated the practice of their teacher to guide them to observe and discover rules and generalization by student themselves as frequently. The rest percentages (21.4% and 70.7%) of respondent students rated the application of such pedagogical strategies in the science classes as rarely and not at all respectively.

Beside, data obtained from focus group discussions indicate that the existence of some promising activities by science teachers, but not as it is expected in curriculum materials. The informant teachers in focus group discussions agreed that they didn't always apply the suggested pedagogical strategies in their schools. That means absence of frequent application of student – centered methods in their classrooms due to many interrelated factors such as lack of feasible teaching methods, huge contents, lack of support from schools, lack of relevant instructional materials, student background towards active learning, etc. In particular one of these informants (physic teacher) asserts it as:

> "...according to my opinion, the reason why I didn't always apply the stated strategies in the classroom are: if I follow all prescribed strategies, I can't be able to cover the whole contents in this academic year since the syllabus has huge amount of contents and the stated methods need more time and resources. However, I will be evaluated by the school in terms of covering the textbook rather than following of methods in the curriculum." /Apr. 16, 2007/

This implies that science teachers of surveyed schools are still following the traditional procedures of teaching –explanations and lecture.

Here, the general secondary school science subject syllabi EMPDA (1989) have recommended different teaching methods which advocate problem solving approaches. Teaching methods that allow students to search out information, organize, generalize and draw conclusions by their own effort. But, the above data shows that the majority of science teachers in the surveyed schools didn't frequently apply the prescribed teaching methods in curriculum documents. Thus, the above data by itself shows the discrepancy between the 'intended' and the 'observed' curriculum.

Table 2 also shows that the performances of science teachers in relating the content of the syllabi with students surrounding or real life activities as rated by their students are 47.9% not at all and 40.0% rarely. Though it has been observed such practice in surveyed school, the MOE (2002:42) stated that one of the responsibility of teacher as:

> « በክፍል ውስጥ እና ዉጪ የሚሰጠውን ትምህርት ከተማሪዎች የሕይወት ተሞክሮና ከአካባቢ የልማት ራዕይ ጋር በማጣጣም ይሰጣል:: »

Thus, these practices of teachers in surveyed schools fail to address the requirement of curriculum materials.

Teaching science through different continuous assessment techniques (oral, class work, homework, mid exams, final exams etc) is another instructional strategy suggested in curriculum documents (policy guideline, syllabi and teachers guides).

The performance of science teachers' to use different assessment techniques as rated by informant students seems a little bit convincing. That is, significant percentage (34.3%) of students indicated as frequently about the practice of their science teachers in using different assessment techniques. Only 23.6% of respondent students rated it as not at all. In this regard, Jenkins (2003:194–195) suggested that effective science subjects teaching method involves effective assessment technique that provide information about the performance level of at least majority of students, so that it guides the over all teaching – learning activities. Similarly, Bekalo and Welford (2000:125) stressed the importance of checking for understanding the content of science curriculum. Thus, surveyed science teachers do have some good practice in this regard.

Furthermore, 60.7% of respondent students indicated that their science teachers are frequently available in the school and will to provide academical assistances to students. Others, 30% rated as rarely and 9.3% as not at all. Here, again surveyed teachers' do have some promising trend to assist their students through study time and make up classes. In this connection, Collahan (1998:2) noted that teacher attitudes (readiness and willingness) and devotion towards the teaching-learning process is equally important as their ability and competency for

successful implementation of curriculum materials. In addition, Weiss (1994:20) after studying students' performance in science and mathematic subjects in USA concluded that students who get additional academic assistance from their teachers are found to be high level achiever in learning of science and mathematics subjects.

Regardless of these facts, most of the observed teachers in their respective schools didn't perform their duties as stated in curriculum materials. For instance, in 85% of observed sessions, teachers didn't apply the stated teaching methods and even didn't prepare lesson plan for their classroom activities which is by itself bad practice of science teachers in the surveyed schools. In this regard, one of chemistry teacher asserted that:

> "There is no culture of preparing lesson plans for the teaching-learning activities in our school since, currently, we assigned to teach four different section (from grade 9 to 12) with 22 periods per week, as a result we couldn't be able to prepare lesson plans and instruction materials for all of these sections." /Apr. 26, 2007/

However, Robert et al. (1983:108) noted that the use of planning is one of the principles of modern teaching to be carefully considered by all teachers so that they could secure systematic act of teaching in the classroom. If otherwise, teachers' sporadic actions in the classroom would be fruitless since proper teaching and learning can not occur in unplanned and haphazard activities. Thus, according to Robert et al. (1983) teacher without lesson plan doesn't know what to teach, how to teach and for what to teach.

Therefore, it is possible to sum up from the above data (table, focus group discussion and observation) that science teachers are attempted to perform better in terms of providing of additional academical assistances for their students, rarely using of variety teaching methods and using of different assessment techniques. However, they are not able to implement the curricula as intended by employing the prescribed student centered methods.

4.1.3 Assessment of students' attitude towards learning of science subjects.

The attitude of an individual student towards a given subject is one determinant factor for successful implementation of curriculum document. In this regard, Tyler in Stenhouse (1975:53) asserts:

> "...the real purpose of education is not to have the instructor perform certain activities, but to bring about significant changes in the students' patterns of behavior. It becomes important to recognize that any statement of the objectives of the school should be a statement of change to take place in students."

Thus, the following data shows students' responses regarding their science subjects learning practice. The study is intended, with this understanding, to assess how the current teaching – learning practice of science subjects in selected schools develop positive attitude on students'.

Table 3. Students' attitudes towards learning of science subject as perceived by themselves.

No	Items	Students Responses			Total
		Frequently	Rarely	Not at all	
1	Do you believe that learning science subjects at this level is difficult?	63(43.5%)	27(20.7%)	50(35.7%)	"
2	Do you have a practice of reading reference books for science subjects?	45(32.1%)	36(25.7%)	59(42.1%)	"
3	Do you have a habit of participating in different science clubs in your school?	5(3.6%)	17(12.1%)	118 (84.36%)	"
5	Do you have interest to continue in natural science stream in your future career?	54(38.6%)	36(25.7%)	50(35.7%)	"

The valid criterion of success in schooling is the degree to which it has been able to bring a desirable behavioral change on students. This shows that the implementation strategies school use is an important aspect of educational activities to realize the intended curriculum materials. It was observed in most of classrooms that teachers were not able to implement student-centered methods. As result majority of students were not ready and eager to participate in the teaching learning process of science subjects. Rather, majority of students simply take note from black board or did their own personal work while science lessons. This has an implication for the weak interest of students' towards the science subjects.

The student respondents also asked to rate about the level of difficult of learning science subject in their respective grades (9 and 10), thus, 43.6% and 35.7 % of respondent students reported that learning science subjects at this level as difficult and not difficult respectively.

In these regard, Hass (1971:564-565) noted that teaching must not overlook the concerns of the learners. It should consider the deep felt feelings, emotions and anxieties of pupils. The materials presented should either be within the learner's realm of knowledge and experience or it should be easily connected with it. Thus, according to this statement, the surveyed school couldn't able to create positive attitude towards science subjects on students. It might be due irrelevant implementation strategies the schools used that don't consider the emotions and anxieties of majority students.

On the other hand, though significant number of students (32.1%) reported that they have been developed a practice of using additional reference books to have further knowledge in science subjects, 42.1% of respondent students didn't completely develop habit of reading reference books for these subjects. In addition, high percentage (84.3%) of respondent students indicated that they didn't have practice of participating in co-curricula activities such as different science clubs. Only 3.6% of respondent students indicate the habit of participating in science clubs as "frequently". Beside, the data from observation notes in the respective school also shows the absence of science club activities.

That is, it was observed that only there is a practice of forming different clubs at the beginning of the academic year. But, there is no such significant activity by the clubs through which students may gain different knowledge, skill and more than these positive attitudes towards subjects. In this regard, a director while interview also asserted that:

> "…. we know that one of our responsibility as a school is forming of different clubs, but due many problems like readiness on the side of teachers and students, lack of assistance from different bodies, lack of resources (material as well as time) etc, we can not be able to run clubs as it is suggested in policy guideline." /April 13, 2007/

This trend of the selected schools may have its own negative impact on students' attitude towards learning science subjects. Thus, absence of science clubs activities in selected schools may be considered as one of the challenges the mission schools encountered in translating of the intended science curriculum into practice.

Furthermore, the above data depict that almost similar percentage of respondent students (38.6% and 35.7%) do have interest to or not to study natural science stream in their future career. But, the rest 25.7% respondent students don't still decided their choice of stream. Hence, this may be considered as a good practice of surveyed schools since they are able to prepare student for different stream. In this regard, the TGE (1994:14-15) policy document shows that general secondary education (grade 9 and 10) is a special phase and part of the total process involved in education at which students develop different attitudes for further education, for specific program (academic as well as vocational) of training and for the world of work.

In general, it is possible to conclude from the above data, the current implementation trends in the surveyed schools couldn't be able to develop positive attitudes on majority of students' towards learning of science subjects. This implies how the observed curriculum implementation practices affect the expected educational outcome - attitude.

4. 2 Material resources related issues

4.2.1 Curriculum materials.

The availability and utilization of curriculum materials such as policy guidelines, syllabi, teachers' guides, textbooks etc, have great impact on achievements of the intended goals of education and particularly schools goals. The school can't perform any activity without such materials. Hence, the data presented below shows that how much such curriculum materials are available and utilize in the surveyed schools for effective teaching-learning process of science subjects.

Table 4. Availability of curriculum materials as rated by teachers.

No	Items	Responses			Total
		Adequate	Inadequate	Not at all	
1	Policy guideline of MOE	11(78.6%)	3(21.4%)	0(0.0%)	N=14 (100%)
2	Syllabus	8(57.1%)	6(42.9%)	0(0.0%)	,,
3	Teachers' guide	9(64.3%)	5(35.7%)	0(0.0%)	,,
4	Textbooks for students	5(35.7%)	6(42.9%)	3(21.4%)	,,

The above data depict that the selected schools have almost adequate curriculum materials except textbooks for students which could help to achieve the expected school goals. For instance, 78.6% of respondent teachers indicated that there is adequate educational policy guideline of MOE in their school and 57.1% of these teachers responded that the adequate availability of syllabus for their respective science subjects. Similarly, 64.3% of respondent teachers indicated the adequate availability of teachers' guide for respective science subjects. However, there is no one who reported the absence of policy guideline, syllabus as well as teachers' guides in the surveyed schools.

Contrary to these, 21.4% of respondent teachers indicated the absence of textbooks for students and 42.9% of respondents also indicated the inadequate availability of textbooks for science subjects. That is, only 35.7% of teachers rated the availability of adequate textbooks for students in the respective schools. In this regard, majority of interviewed principals also reported that the supply of curriculum materials from MOE through Zone and Wereda education offices as adequate. The interviewed principals also agreed with the above data about the shortage of student textbooks for science subjects. According to them, in this academic year (1999E.C) schools have faced some challenges with regard to the supply of textbooks for grade 9 and 10. This is due to the fact that the textbooks are improved in last year by ICDR; hence, the distribution of such edited textbooks is not adequate as comparing with number of students in the school. Thus, according to these informant principals, the problem is temporary and will be solved through negotiation with concerned bodies.

The data from observation notes also indicated that the availability and utilization of textbooks in the teaching learning processes of science subjects as inadequate. Particularly, it is observed in one of the surveyed schools that the existent of textbooks for chemistry and biology in classrooms as inadequate. That is, it was observed on average one textbook for four students (1:4 ratios).

Therefore, the result of this study shows that except textbooks for students almost there is adequate supply of curriculum materials in the surveyed schools. According to Girma in IER (2002:39-40) the availability of adequate curriculum materials could likely influence the smooth implementation process and thereby facilitating the end results of instruction in the classroom. This means, the availability and utilization of curriculum materials can influence positively the process of curriculum implementation attempt and learning activities of students as it is required, but not guarantee alone. The result of this data contrasts to some extent with the findings of Dereje in IER (2002:146) who indicated that curriculum implementations in Ethiopia were hampered by shortage or poor supply of curriculum materials. This difference might happen due to the specific nature of the surveyed schools or the time of investigations.

4.2.2 Infrastructural Facilities

The condition of internal facilities in the school, particularly in the classrooms has great impact on the teaching-learning activities. If schools have adequate desks, chairs, chalkboards, notice boards etc in classrooms, laboratories, libraries and pedagogical centers, they obviously facilitate the effective translation of curriculum documents into practice. These facilities create conducive teaching-learning environment in the school.

Thus, this study is intended to evaluate as one variable the availability of infrastructural facilities in the selected schools as follows:

Table 5. Availability of facilities in the schools as rated by teachers and students.

No	Items	Rating Scale			Total
		Adequate	Inadequate	None existent	
1	Student desks and chairs in the classroom	154(100%)	0(0.0%)	0(0.0%)	N=154 (100%)
2	Students desk and chair in the laboratory	132(85.7%)	22(14.3%)	0(0.0%)	,,
3	Students' desks and chairs in the library.	142(92.2%)	12(8.2%)	0(0.0%)	,,
4	Teachers' desks and chairs in the classroom.	154(100%)	O (0.0%)	0(0.0%)	,,
5	Chalkboard in the classroom	154(100%)	0(0.0%)	0(0.0%)	,,
6	Notice board in the school.	145(94.1%)	9(5.9%)	0(0.0%)	,,

As revealed in table 5, all surveyed schools have almost adequate infrastructural facilities. For instance, all (100%) informant teachers and students indicated that there are adequate facilities of students' and teachers' desk and chair in the classrooms.

The table also depict that 85.7% and 92.2% of informants rated the availability of students' desks and chairs in the science laboratories and library respectively as adequate. Beside this data in the table, it was also observed that the selected schools have adequate supply of physical facilities as compared with the number of students in the school. This is in line with the view of Majasan (1995:48) who noted that in order to have effective teaching learning in the classroom; it should be equipped with facilities. Because whatever cleaver, the teacher may be if the classroom is ill – equipped with furniture or overcrowded, effective teaching will be hampered.

In addition to these, it was observed that different posters, photographs or pictures on the wall of classrooms, library and laboratories that can serve as teaching aids or materials for respective science subjects. For instance, one of the surveyed schools was decorated by periodic table, parts of body, photos of different living things, laboratories equipments and apparatus etc. In this connection, Kinder (1995:63) denoted that teaching materials are devices, which can be used to make learning experience more concrete, more realistic and more dynamic. Hence, teaching materials are self-supporting materials, which present a body of information for the pupils. Hence, this practice of the surveyed schools may help students to look or remember the contents of science lesson in their day-to-day school activities.

Therefore, these in general show how the context of surveyed schools is conductive in terms of physical facilities for effective implementation of science curriculum.

4.2.3 Instructional facilities for science subjects

Instructional facilities: library, laboratory, information and communication technology (ICT) etc need to be adequately available and utilized to support the demand of school curriculum in general, but as with science curriculum of secondary schools in particular. There is no doubt about the need of such instructional facilities for implementation of science curriculum. This is because the broad range of different learning outcomes: cognitive, affective and manipulative expected from science subjects need materials and facilities. Hence this study intended to evaluate the availability, relevance and utilization of such instructional facilities in the surveyed schools as follow:

Table 6. Instructional facilities as rated by teachers and/or students.

No	Facilities	Instructional consideration	Responses			Total
			Adequate	Inadequate	Not at all	
1	Library	Does the school have adequate access of library against the no of students?	136 (88.3%)	18 (11.7%)	0 (0.0%)	N=154 (100%)
		Does the school library have relevant reference books for science subjects?	2 (14.3%)	6 (42.9%)	6 (42.9%)	N=14 (100%)
2	Laboratories (science)	Does the school have adequate access of laboratories for each science subjects?	108 (70.1%)	34 (22.1%)	10 (7.8%)	N=154 (100%)
		Do the school science laboratories have relevant and appropriate tools, chemicals, equipments etc for the respective grades?	2(14.3%)	8 (58.1%)	4 (28.6%	N=14 (100%)
		Does the school utilize these laboratories for teaching learning activities of science subjects?	22 (14.3%)	56 (36.4%)	76 (49.4%)	N=154 (100%)
3	ICT or plasma system	Does the school have plasma facilities for teaching of science subjects?	5(3.2%)	19 (12.4%)	130 (84.4%)	"

Most educators believe that libraries are store of knowledge from which one can get important information. As such, the function of a school library is to enrich the education program of a school. In line with this fact and others, MOE (2002:93) in policy guideline set standards for secondary school library. It recommended adequate, appropriate, a carefully planned room and well selected and organized books with audiovisual materials. In this regard as it is shown in table 6, majority of informants (88.3%) indicated, the existent of adequate access of library as compared with the number of students in their school. But, only 14.3% of informant teachers believe that their school library has relevant reference books for grade 9 and 10 science subjects. That is, 42.9% respondents don't completely believe that their school library has relevant reference books. This implies the existent of gap between the intention of policy and practice of surveyed schools.

In the same vein, laboratories are important educational facilities in school in general and in secondary schools in particular for various reasons. The most important condition according to Edmonson and Roemer (1986:160) is to conduct practical works or experiment in laboratory, which is pertinent to materialize theory into practices. In Ethiopia, standard set by ESDP II (2002:99) has also recommended three laboratories (for Biology, Chemistry and Physics) with appropriate and relevant resources for secondary schools. In this connection, table 6 shows that the selected schools have adequate access of laboratories for each science subject's i.e 70.1% of respondents indicated, the existence of laboratories in their school. However, 28.6% of respondents' teachers don't completely agree with the relevance of materials (chemicals, tools, equipment etc) in the respective laboratory for science subjects of grade 9 and 10.

In addition to these, 49.4% of informants reported the non-existent of practice of utilizing laboratories for the teaching – learning activities. This implies that the absence of practical work (laboratory work) in the teaching – learning processes.

The interview result with principals, however, has some deviation from data with regard to relevance of instructional facilities. Two of the interviewed principals (among three) didn't agree with the above informants teachers. That is,

they reported that the materials (books, chemicals, tools, equipments, etc) which are found in the schools are relevant for the demand of science curriculums of grade 9 and 10. But, they (directors) agreed that the utilization of these resources as input for teaching-learning process is weak or not promising as compared to their availability. According to them, the reasons for not using of such resources are not directly related with their appropriateness, however, it is due to many other problems like; awareness' of teachers and students, problem of coordination human, material and time resources in the schools, over loadness of period on teachers and students etc. In this regard, one of the school directors asserts:

> "... it is fact we do have adequate instructional facilities for science subjects which are imported (as donation or purchase) from abroad by missionaries. As far as my understanding is concerned, these instructional materials are relevant for grade 9 and 10 science subjects. But, I know that the utilization of resources for the teaching – learning process is not promising due many other problems." /Apr. 26, 2007/

In contrast to the above data, school teachers in focus group discussion reported that they have faced challenges to utilize the available reference books, chemicals, tools, and equipment for the teaching learning processes. According to them, though there are excess amount of materials in their schools, majority of resources are not in line with the demand of current curriculum materials of grade 9 and 10. For instance, one chemistry teacher in focus group discussion asserted that:

> "I know that teaching chemistry with the help of practical work is very interesting for students.... Our school seems having excess materials in the laboratory, but I couldn't found relevant chemicals, apparatus, and equipments for grade 9 and 10 chemistry. As a result, I couldn't be able to teach the subject though laboratory works as required." /Apr. 26, 2007/

The reason for the difference between the responses of the principals and the teachers may be due to the fact that the school principals in all of the selected schools aren't science subjects' professionals; hence, they may look the physical appearance of materials rather than their appropriateness and relevancy for the corresponding subjects.

This result to some extent compromise with the finding of Bekalo and Welford (2000:122) who find out Ethiopia secondary school students do not receive the practical experiences specified in official science curriculum. This according to them is due to the problems in teachers training programs (both pre and in-service), complexity of objectives and contents in the curriculum, improper implementation practice by schools and lack of appropriate/relevant resources in the schools. The finding of the present study is also indicating at least the presence of some of these problems in the surveyed schools.

Therefore, we can sum up our discussion from the above data as: though the surveyed schools have excess instructional materials in the libraries and laboratories for science subjects, majority of these resources are not used for the teaching learning processes. One of the factors is related with their relevance and appropriateness for grade 9 and 10 science subjects.

Furthermore, table 6 summarized almost total absence of information and communication technology in surveyed schools. That is, 84.4% of informants reported the complete absence of plasma facilities in their schools. Besides, while interview one of the principals asserts:

> "... absence of plasma facilities in our school is not due problems of the school itself, but the problem is from governmental bodies: Telecommunication Agency, Ministry of Education, Educational Media Agency etc. These bodies are involved in installation of plasma for governmental schools throughout the nation. However, they didn't consider our school as communities' schools, which serve the people of this nation so that they didn't give us the chance of having plasma facilities. Even up on the request of the program installation (plasma) by church own budget, these bodies didn't respond for the question of having plasma facilities in our school." /Apr. 8, 2007/

Similarly, another director noted that:

> "...our students frequently ask us: 'why we learn through plasma like that of governmental schools students?' ....In addition to this we know that one of the demands of secondary science curriculum is having of plasma facilities for the teaching learning process. However, yet our school has no such facilities due to internal (in church) and

external (with governmental bodies) problems... and I hope we will have plasma facilities in the near future with the help of government." /Apr. 26, 2007/

These statements implies that the absence of plasma facilities in the surveyed due weak collaboration trend between missionary owned secondary schools and governmental bodies.

However, educators emphasized the importance of plasma in teaching – learning process in general and in secondary school in particular. For instance, Richardson et al (1987: 204) noted that the benefits of technology integration are best realized when learning is not just the process of transforming facts from one person to another, but when teachers' goals is to empower students as critical thinkers and problem solvers. Similarly, Wakshum (2001:62) recommended that the suggested student centered methods should be supported by technologies which provide a conceptual frame for children about the lessons. According to Wakshum (2001:64) through ICT students can collect information in multiple formats and then organize, visualize, link and discover relationships among facts and events.

Therefore, this data can be considered as one of the challenges the selected schools encountered while implementing the Education and Training Policy of Ethiopia and in particular the general secondary school science curricula.

4.3 Organizational related issues

Goodland (1984:220–223) in his book of "A Place Called School" noted that the task of school as an organization is primarily enhancing the skill and knowledge of people in the organization. This goal of school can be achieved through holding the various piece of the organization together in a productive relationship. It also creates common culture of expectations around the use of those skills and knowledge and holding individuals' contributions to the collective results. Thus, there are numerous organizational aspects that facilitate or hinder the implementation of curriculum materials in the school.

Among them the management structure of schools, the communication channel among people involved in the implementation and provision of staff development programs are considered as organizational related factors for the conception of this study.

4.3.1 School management structure

The management structure of a school has its own position for successful implementation of curriculum materials. Since the management structure of the schools facilitate the coordination of resources (human, material, finance and time), identify the role relationship of different parties in the school and put how to solve problems that arise in the implementation activities. Therefore, the present investigation intended to examine the nature of school management structure in the surveyed schools as follow:

Table 7. School management structure as perceived by teachers.

No	Issues	Responses			Total
		Very Convenient	Convenient	Not Convenient	
1	The extent to which the current management structure of your school facilitate the implementation of science curriculum?	4(28.6%)	3(21.4%)	7(50.0%)	N= 14 (100%)
2	The extent to which the current management structure of your school coordinate the available resources (human, material, finance and time) for effective implementation of curriculum materials?	4(28.6%)	4(28.6%)	6(42.9%)	"
3	The extent to which the current management structure of your school create a positive role relationship with governmental bodies for implementing of the ETP of the country?	3(21.4%)	5(35.7%)	6(42.9%)	"
4	The extent to which the current management structure of your school can easily solve problems that arise in teaching – learning process?	3(21.4%)	4(28.6%)	7(50.0%)	"

As it has been depicted in table 7, only 28.6% of respondent teachers perceived that the current organizational structure of their schools facilitate the implementation of science curriculum very conveniently. Where as, 21.4% and 50.0% of teachers expressed their views as convenient and not convenient respectively.

Similarly, only 28.6% of respondent teachers indicated that their school structure could coordinate the school resources very conveniently for the teaching learning process of science subjects, but majority of teachers (42.9% and 28.6%) indicated as not convenient and convenient respectively. Moreover, the responses of significant percent of teachers (42.9%) shows that the current management structure of their school didn't completely create a positive role relationship with government bodies in relation to Education and Training Policy of the country. Alongside, one of the interviewed directors asserts that:

> "...with regard to the collaboration trend between the school and Zone or Werada Education offices for successful implementation of curriculum documents.... I don't believe as promising. Experts of these offices didn't support (technical and professional) or supervise our activities for feedback as required, but they rarely came to our school for only amending our licenses..." / Apr. 26, 2007/

This shows the extent to which the surveyed schools didn't supervise by governmental bodies for checking of their standards or performances. This practice is not in line with agreements of MOE and ECCS in August, 1994 that noted the importance of supervision for feedback and to improve the quality of Education in mission schools. Moreover, ESDP II (2001:67) also mentioned, the need of collaboration trend among different stakeholders in the education sector of the country. It also fails to address the view of Orenstein and Hunkins (1998:292) who noted that curriculum implementation is collaborating and teamwork, which require a clear understanding and acceptance of duties and responsibilities. In addition, it needs process of interaction between those who have developed the program and those who are charged to deliver it.

It has been also displayed in table 7; the response of half of respondent teachers (50.0%) is not convenient with regard to problem solving capacity of the school management structure. That is, only 21.4% of respondent teachers indicated as very convenient. Beside, data obtained from focus group discussions and interviews indicate the same result with this data. That is, most informants' teachers and principals expressed their opinion as not convenient about the problem solving capacity of their school management structure. According to

them, since the structure of school management highly interwoven with church administration structure, the school as an independent organization can't easily and immediately solve problems that arise in the teaching learning process. To solve problems which arise in the teaching learning process, the schools have to pass through different challenges that take more time and effort. In supporting this idea, one of interviewed principal asserts:

> "... the school has no full autonomy in coordinating, allocating, and leading resources (human, material and finance) of the school. Almost all of these are directly or indirectly linked with church management structure. Due to such complex nature of organizational structure, we can't always easily solve problems that arise in the teaching-learning process since most of such problems are solved through such resources." /Apr. 8, 2007/

This result fails to be in line with the view of Edmond (1981:201) who stated that successful schools are those schools that have power and authority in resources, able to solve problems immediately and will to make organizational change for the benefit of students. Therefore, the analysis of the above data shows that the surveyed schools do not have conducive management structure. That is, it can't be able to facilitate, coordinate, solve problems easily and create positive role relationship with others parties for effective implementation of curriculum materials.

4.3.2 **The nature of communication in the school**

Curriculum implementation is a collaborative or teamwork. To bring these trends, effective communication channel among school communities should be developed in the school. It is through such channel a clear understanding and acceptance of duties and responsibilities inserted on the part of each party. Thus, the data presented below show the nature of communication that is developed among school communities.

Table 8. The nature of communication channel from teachers' point of views.

No	Responses				Total
	Issues	Frequently	Rarely	Not at all	
1	The extent to which you discuss issues of science curriculum implementation with school principal?	7(50.0%)	5(35.7%)	2(14.3%)	N=14 (100%)
2	The extent to which your school hold departmental meeting in relation to issues of science curriculum implementation?	2(14.3%)	4(28.6%)	8(57.1%)	"
3	The extent to which you discuss issues of teaching methods and/or assessment techniques with students?	9(64.3%)	4(2.6%)	1(7.1%)	"

There is no doubt about the role of communication practice a teacher has with director, department head, students and his peers on curriculum implementation and in particular teacher's own performance in the classroom. In this regard, table 8 depict that half of respondent teachers (50.0%) rated as frequently about the culture of discussion issues of science curriculum implementation with their principal, whereas 35.7% and 14.3% rated as rarely and not at all respectively. Beside, most interviewed principals (almost all threes) reported that the existence of good communication channel between them and the teachers. According to the interviewed principals, some of academic problems arise in the teaching-learning process could be solved through discussion with teachers and students.

In this connection, Shiundu and Omulando (1992:251) remarked, the existent of culture of discussion between teachers and principals facilitate the effective implementation of curriculum. It develops supportive organization arrangements, consulting and reinforcing culture between teachers and change facilitating teams. This implies that in the surveyed schools there is a culture of discussing issues of science curriculum implementation between teachers and principal.

Thus, this practice of schools contributes its own positive impact on the process of translating the curriculum into practice, but not promising alone.

However, the above table (8) displayed that the existence of weak departmental meetings in surveyed schools. That is, majority of respondent teachers (28.6% and 57.1%) rated as weak and totally absence of departmental meetings in relation to science curriculum implementation in their schools respectively. Similarly, data obtained from focus group discussions show, the same result with the above data. For instance, one of physics teacher who participated in focus group discussion asserts:

> "Since there is only one or two teachers for each science subject, we don't have department for each subjects, but the school have one science department which was founded by biology, chemistry and physics teachers as members. Hence, the activity of department is weak or we meet once in a semester to discuss about the teaching -learning process in general, rather than a specific subject." /Apr. 18, 2007/

This result fails to address the statement of Fullan (1991:67-73) who indicated that collegiality, trust and interaction between teachers through department raises the degree of implementation. Hence, absence of departmental meetings directed to a specific subject is reported by the teachers as one of the observed problems in the surveyed schools.

Moreover, the above table (8) displayed that 64.3% of respondent teachers reported the existence of frequent practice of discussion between teachers and students about the teaching-leaning process, whereas, 28.1% and 7.1% reported as rarely and not at all respectively. In the same vein, the observation data agreed with this data. That is, it was observed in the surveyed schools, the existence of almost promising interaction trend between teachers and students with regard to their academic problems

Thus, in surveyed schools there is good communication culture between teachers and students which can be consider as one successful practice of the surveyed schools, but not guarantee alone for achievement of students.

Table 9. The nature of communication channel as perceived by students.

No	Issues	Responses			Total
		Frequently	Rarely	Not at all	
1	The extent to which you discuses issues related to the teaching-learning process of science subjects with your teachers.	80(57.1%)	40 (28.6%)	20(14.3%)	N=140 (100%)
2	The extent to which you discusses issues of science curriculum implementation with school director.	30(21.4%)	70 (50 %)	40(28.6%	"
3	The extent to which you discuss issues of science curriculum implementation with yours peers (others students).	70(50.0%)	10 (7.1%)	60 (42.9%)	"

Schools are established to serve students, students' achievement is the goal of instruction and therefore, all activities of a school should be accountable for students' achievement. In order to achieve such school goals there should be a culture of interaction between students and others school community, particularly with teachers and principals. In this connection, table 9 shows that 57.1% of respondent students rated as frequently about the pattern of discussing issues of science curriculum implementation with their teachers, whereas only 14.3% of responded the absence such trend.

The success of the intended objectives can't be realized without the interaction of school principal and students, because both do have prominent positions in the school system. In this regard, table 9 shows that insignificant percent of respondent students (28.6%) indicated the absence interaction between students and principal. And, 50 % of respondent students rated as rarely. This implies that there is no so much promising communication channel between principals and students in the surveyed schools. This practice has its own negative impact on

the teaching-learning activities of the science subjects and consequently students' achievement.

There is no doubt about the importance of peer group discussion (students with students) on the teaching-learning process. This is due the fact that they can freely discuss their interest or problems with their relatives. Here, the above table (9) depict that almost equal percent of respondent students (50.0% and 42.9%) indicated their experience of discussing issues of science subjects with their peer as frequently and not at all respectively. This culture may be due the interest of individual student towards science subjects.

In these regard Snyder et al. (1996: 416) affirmed that student communication with teachers, principals and their peers about the teaching – learning process increase confidence on their study, valuing the school for their achievement and increases their readiness for the teaching-learning process. Therefore, from the data presented above and followed by discussion, the context of communication channel in surveyed schools is good, particularly teachers with students and school principals.

4.3.3 The provision of staff development programs in schools.

Wossenu (2001:52) noted that if we need successful implementation of innovation in the school which includes new curriculum, new content, new teaching approaches, new technology etc, almost inevitably need continuous staff development programs. It is through professional development programs (both pre-service and in-service) possible to introduce the content, value and strategies of innovation on the part of implementers.

Based on this fact, the present study intended to assess the provision of in-service trainings for principals and teachers in the surveyed school as follow:

Table 10. Staff development programs in the schools from teachers' point of views.

No	Issues	Responses		Total
		Yes	No	
1	Have you participated in any in – service training programs (seminar, workshop or any other) with regard to science curriculum implementation?	10(71.4%)	4(28.6%)	N=14 (100%)
2	Do you think that the in-service trainings you have taken are relevant or important for your classroom performance?	4(36.4%)	7(63.6%)	N=11 (100)
3	Do you think that you need more training programs to increase your classroom performance?	12(85.7%)	2(14.3%)	N=14 (100%)

The data in table 10 reveals that 71.4% of respondent teachers have received in-service training in relation to science curriculum implementation. But, 63.6% of these teachers (who received in-service training) don't believe the importance of the training programs they participated for effective implementation of their respective curriculum.

Most of science teachers also express their opinion in focus group discussion as; though the school arranged in-service training programs to improve our performance in the school, most of the training programs are not in line with the demand of curriculum materials rather most of the training programs focus on moral and ethical issues. In this regard, a biology teacher in FGD asserts:

> "I participated about three in service training programs starting from last year. Most of in-service training programs were given by missionaries who came from abroad and didn't know the context of Ethiopian education system, particularly the science curriculum materials. As result, I didn't gain so much benefit from the programs." /Apr. 13, 2007/

These data implies that the surveyed schools have put their efforts to provide in service training programs for science teachers, but it is not in line with the interest of teachers. Regarding this, Schermerborn (1989:254) noted that good training programs should at least address the following five steps; assess needs, set objectives, select methods, implement the program and evaluate the program.

Thus, one of the factors that create the gap between teachers and in service training programs is due lack of these steps, particularly the need assessment step.

Teachers also asked to give their opinion about the need of more additional in-service training programs to increase their performance in the teaching-learning processes. 85.1% of respondent teachers indicated that they need more additional but relevant training to improve their performances.

Moreover, the present study also tried to assess the practice of surveyed school in provision of professional development programs for principals. Accordingly, two of interviewed directors reported that they have taken different in service training programs in relation to school management system that are organized by ECCS. They indicated that most of the trainings they received were relevant and important for their position. For instance, one principal affirms in his words as:

> "I was the director of this school starting from 2001 since then my organization (the church) has arranged different in service training programs in relation to school management system...I found the training programs as important for the position as well as for my performance as school director." / Apr. 8, 2007/

But one of the interviewed principal reported that he hasn't participate in training programs in relation to his position in the school since he is assigned as principal last year (1998E.C).

To sum up, the result of this study shows that the surveyed schools are arranged in service training programs for principals which they found it as important. However, the in service training programs arranged for teachers were not seems relevant since it was developed without assessment of teachers' need. In this regard, McNeil (1990:230) noted that in school situation, professional development for teachers and other staff members has a major purpose of enriching the educational opportunities and consequently students' performance. Moreover, in-service training programs should relate the goals of school with individual teacher role in achieving those objectives set in curriculum material. Thus, science teachers of surveyed school are in problem or facing challenges with regard to relevant profession development programs.

CHAPTER FIVE

SUMMARY, CONCLUTIONS AND IMPLICATIONS

5.1 Summary

The study was intended to evaluate how missionary owned secondary schools implement the science curricula of grade 9 and 10 through identifying successes and challenges they came across in translating the curriculum into practice.

On the basis of analysis made on the data gathered through interviews, observations, focus group discussions and questionnaires, the summary of the findings is presented below:

First, with regard to principals' performance, the data reveal that most activities of principals in their respective schools are not congruence with the prescribed duties and responsibilities. For instance, only 21.6% and 28.9% of respondents' teachers indicated that their principals frequently guide or orient their tasks and support them for better achievements in the school respectively. Similarly, only 14.3% teachers rated as frequently that the principal of their schools supervise them for feedback and facilitate the utilization school resources for the teaching-learning process. Data obtained from interviews and focus group discussions also show, the performance of surveyed principals in leading the schools as an organization is restricted in certain aspects such as orienting tasks and providing of professional or technical support for teachers and students.

Second, with regard to teachers' performance, only 12.1% and 7.9% respondent students' perceived that science teachers employ frequently different teaching methods suggested in curriculum materials and student centered approaches in classroom respectively. Data obtained from focus group discussions with teachers and observations data also indicated, the teaching strategies in classrooms were characterized as being predominantly 'teachers control': usually the teachers fully regulate the teaching-learning activities. Similarly, only 12.1% of respondent students rated, science teachers frequently relate their lesson to students' real life situations. However, significant percent (34.3%) of students indicated that science teachers frequently employ different assessment strategies such as class work,

home work, mid exam, final exam. etc to check their understandings and majority of students (60.7%) also reported that their teachers were available and will to provide academicals assistance like additional time study or make up class for students.

Third, with regard to students' attitude towards learning science subjects, the data revealed that majority of respondent (60%) students' do not completely developed positive attitude towards learning science subjects. Beside this data, it was observed in most of classrooms that teachers were not able to implement student-centered methods. As result majority of students were not ready and eager to participate in the teaching learning process of science subjects. Moreover, 43.6% of informant students also rated, learning of science subjects in the corresponding grades as difficulty. Similarly, only 32.1% of respondent students reported that they have developed a culture of reading additional reference books for science subjects to have further science concepts. Moreover, the data revealed that 38.6% of respondent students have a dream to continue in natural science stream in their future career.

Fourth, the surveyed schools have adequate access of curriculum materials. About 75% of respondent teachers and students as well as interviewed principals rated their schools have adequate policy guidelines of MOE, syllabi for science subjects and teachers guide in their respective school. However, the data reveal the temporary inadequate supply of textbooks for science subjects in 1999E.C academic year.

Fifth, as it has been perceived by respondent teachers, students and interviewed principals, the surveyed schools have adequate infrastructural facilities: desk, chair, blackboard and notice board for the teaching-learning process of science subjects in the classroom, laboratories and libraries. This implies that the surveyed schools are well equipped with the necessary furniture.

Sixth, with regard to instructional facilities for science subjects, though above three-fourth of informant teachers and students indicate the adequate access to libraries and laboratories for science subjects, only 14.3% of respondents teachers' believe that the materials available in the library and laboratories are

relevant and appropriate for the respective curriculum documents. Moreover, the data indicated that almost total absence of information and communication technology facilities in the respective schools.

Seventh, the data showed that schools management structure in the selected schools are not conducive for effective teaching-learning process of science subjects. For instance, half of respondent teachers and all of interviewed principals didn't believe that the current management structure of their organization facilitates or coordinate the available schools resources. The same percent of respondents also didn't believe the problem solving capacity of the management structure as convincing. Similarly, significant percent of respondent teachers (42.9%) and all principals indicated that their schools couldn't be able to create positive role relationships with governmental bodies for successful curriculum implementation process.

Eight, the data showed that the existence of promising communication channel among school communities: teachers with principals, teachers with students and students with students. But 57.0% respondent teachers and two of the interviewed principals indicated that absence of departmental meetings for specific subjects. This implies the absence of mutual sharing of experiences among specific subject teachers. Beside, only 21.4% of respondent students rated that the communication channel between them and the principal to discuss issues of the teaching-learning process in the school as frequently.

Lastly, the data revealed that though the provision of staff development programs as perceived by teachers were adequate, majority (63.6%) didn't believe that the training programs were in line with their interest as well as the demand of curriculum materials. As result, 85.7% of these teachers indicate the need of more additional, but relevant training programs to understand the nature of science curriculum materials. Contrary to this, two of the informant principals reported that the in service training programs arranged for them were relevant and important for their position.

5.2 Conclusions

It can be concluded from the findings of this study that missionary owned secondary schools in East Shoa Zone were successful in the following instances:

- Committing to invest more to improve the teaching-learning process of science subjects: supply of infrastructures, instructional facilities and material resources (physically) for classrooms, laboratories and libraries.
- Creating conducive teaching-learning context for science curriculum implementation such as developing good communication channel among school communities (teachers-principals, teachers-students and student-students).

Regardless of these facts, most activities in the surveyed schools were not congruence with the demands of Education and Training Policy of the country, particularly the science curriculum materials of grade 9 and 10. That is, they could not ~~be able to~~ implement the science curricula as intended.

This is evident from principals and teachers actual practices as to the requirement of the curriculum guidelines in the schools and students' attitudes developed towards learning science subjects. Principals' responsibilities: facilitating, coordinating, supervising, supporting or leading the teaching learning processes were found to be minimal. Teachers in most class sessions teach facts of science subjects rather than empowering of student to be problem solver. The students' involvement in the curriculum implementation process was found to be minimal. As result, students' attitude of learning science subjects doesn't seem to have properly been developed.

The following problems were identified from the investigation of this study as challenges that hinder the effective implementation of science curriculum materials:

- The complex nature of the school management structure.
- Shortage of relevant material resources for the corresponding science subjects in the libraries and laboratories.

- Almost total absence of information and communication facilities in the schools due to lack of collaboration trend between the mission schools and governmental bodies.
- Lack of commitment on the parts of school communities: principals, teachers and students to utilize the existing schools context.
- Though the schools are committed to provide in-service training for science teachers, the trainings lack relevance for the prevailing problems.

Therefore, investing more resources is not the only key to improve the quality of education, particularly the teaching-learning process of science subjects. So that more has to be done to keep the relevance, appropriateness and utilization of resources for successful implementation of science curriculum materials.

5.3 Implications

In light of the findings of the present study, it seems reasonable to suggest the following ideas for betterment of the implementation process in the selected schools.

- It has been investigated that the performance of principals was restricted on certain aspects due the complex nature of management structure of the schools. Thus, in order to alleviate such problem the Ethiopian Catholic Church Secretariat can differentiate the school management structure from church management structure and can give full autonomy and responsibility for the school as an independent, but as sub-part of the organization.
- Low performance of teachers in schools due to over load of periods with sections on teachers and absence of relevant in service training programs were found to be another challenges in curriculum implementation practice. Therefore, the concerned schools administrative bodies can exert their efforts to reduce such problems in the schools though different mechanisms such as increasing the number of teachers in the respective schools and arranging relevant in-service training programs in collaboration with local organizations or with MOE.

- Science teachers and their respective schools can design various mechanisms to develop better attitudes on students' towards learning of science subjects. For instance, besides improving the classroom practice, they need to be aware of the role of science clubs activities to bring the desirable attitudinal changes and make use of these clubs intensively.
- The shortage of relevant and appropriate material resources in the library and laboratories were also found the major factors inhibiting the effective implementation of science curriculum materials. Therefore, the ECCS can exert effort to examine the relevance and quality of materials in the schools whether they are in line with the demand of current science curriculum materials or not. In addition to this, the MOE through Zone and Wereda education offices need to supervise the activities of these schools in general and in particular human and material resources availability, relevancy and utilization trends for the teaching learning activities.
- The absence of information and communication technology in the teaching-learning processes as whole, in particular for science subjects was also investigated in the study. To solve this challenge, the Catholic Church owned secondary schools as well as others missionary owned schools can form partnership or association and negotiate with concerned bodies (MOE, Tele, EMPDA etc) through their association.

REFERENCES

Aggrawal, J. (1997) Development and Planning of Modern Education. New Delhi: Vikas Publishing Company.

Akaleweld Eshete (2001) The Nature and Purpose of Practical one in the Science Curriculum Material (Addis Ababa Administrative Region). /Thesis from AAU/

Alemayehu Teklu (2005) An Evaluation of Teachers Performance in Implementing Geography Curriculum: The case of Gore secondary school. /Thesis from AAU/

Amare Asegdom (1999) Availability and Use of Instructional Materials in Tigray Primary Schools. IER Flambeau 7, 1.

Anderson, J. (1970) The Struggle for the School: the Interaction of Missionary, Colonial Government and Nationalist Enterprise in the Development of Formal Education in Kenya. London: Longman Group Ltd.

Beauchamp, P. (1968) Curriculum Theory. 2nd edition: USA: Kagg Book Company.

Bekalo S. and Welford, G. (2000) Practical Activities in Ethiopian Secondary Sciences: Implications for Policy and Practice of the Match between the Intended and Implemented Curriculum. The Ethiopian Journal of Education, XX, 2.pp 91-133.

Bennarrs, A. et al (1994) Theory and Practice of Education. Nairobi: East African Educational Publishers Ltd.

Best, J. and Kahn, V. (1999) Research in Education. New Delhi: Prentice-Hall of India Private Limited.

Catholic Church Document (August, 1975) Reform in Africa and Renovation of Youth: Pastoral Report of the Third Regional Conference, Vatican.

Collahan, S. (1998) Successful Teaching in Secondary Schools. USA: Foreman Company.

Comber, L. and Keeves, J. (1983) Science Education in Nineteen Countries: An Empirical Study. New York: Wiley.

Conglosi, J. (1991) Evaluating Classroom Instruction. New York: Longman Publishing Group.

Creswell, J. (2003) Research Design: Qualitative, Quantitative and Mixed Methods. New Delhi: University of Nebraska, Linkas Sagle Publication.

Dawit Mekonnen (1999) An Evaluation of Implementation of 7th Grade English Syllabus in East Gojam. /Thesis from AAU/

Derbssa Duffera (2004) Fundamentals of Curriculum Development. AAU/ IER: College of Education.

Edmonds, R. (1981) Search for Effective Schools. The Institute for Research on Teaching, College of Education Michigan State University: East Lansing.

Edmonson, J. and Roemer, J. (1986) The Administration of the Modern Secondary Schools. New York: The Mac Millan Company.

Educational Materials Production and Distribution Agency (1989) Biology Curriculum Guide for Grade 9. Addis Ababa, Ethiopia: EMPDA.

" (1989) Biology Curriculum Guide for Grade 10. Addis Ababa, Ethiopia: EMPDA.

" (1989) Chemistry Curriculum Guide for Grade 9. Addis Ababa, Ethiopia: EMPDA.

" (1989) Chemistry Curriculum Guide for Grade 10.Addis Ababa, Ethiopia: EMPDA.

" (1989) Physics Curriculum Guide for Grade 9. Addis Ababa, Ethiopia: EMPDA.

" (1989) Physics Curriculum Guide for Grade 10. Addis Ababa, Ethiopia: EMPDA.

Ethiopian Catholic Church Secretariat (2006) Educational Activities of the Church in Ethiopia. Addis Ababa: Alpha Printing Press.

Fullan M., (2001) The New Meaning of Educational Change. New York: Teachers College of Columbia University.

Fullan, M. (1999) "The Return on Large Scale Reform" Ontario Institute for Studies in Education, University of Toronto. Forthcoming paper for Journal of Educational Change.

Fullan, M. and Promfret, A. (1977) Research on Curriculum and Instruction Implementation. Review of Educational Research: 47, 2: 335-397. / http://www.jstor.org/wen. Nov. 22, 2006 /

Gagne, R. et al (1992) Principles of Instructional Design. USA: Harcourt Brace Jovanovich College Publisher.

Girma Amare (1967) Aims and Purposes of Ethiopian Church Education. Ethiopian Journal of Education 1, 1.

Goodland, J. (1984) A Place Called School. USA: Mc Graw Hill Book Company.

Hass, G. (1971) Modern Schools and Teaching. Boston: Ally and Bacon, Inc.

Hopper, E. (ed) (1990) Readings the Theory of Educational System. London: Hutchinson University Library.

IER (2002) Quality of Education in Ethiopia, Proceeding of National Conference Held in Adama Ras Hotel. Nov. 9-11: AAU

Jenkins, W. (2003) The Nature Science as a Curriculum Component. Journal of Curriculum Studies: 28, 2, pp. 137-150.

Kinder, J. (1995) Audio-Visual Materials and Techniques. New York: American Book Company.

Lock, N. et al (1991) Improving Educational Quality in Developing Countries. USA: World Bank. Oxford University Press.

Madous, G. and Thomas, K. (1996) Curriculum Evaluation and Assessment in Jackson. Handbook of Research on Curriculum. New York: Mac Milan.

Madous, G. et al (1983) Evaluation Models: view points on Educational and Human Service Evaluation. Boston: Kluwernji Hot Publisher.

Majasan, J. (1995) The Teachers' Profession Manual for Professional Excellence. Ibadam: Spectrum Books Limited.

Marew Zewdie (2000) Curriculum Implementation and Evaluation. (Unpublished)

Marsh, C. and Wills, G. (1995) Curriculum Alternative Approach: on going issues. New York: Simon and Schuster Company.

McCormick, R. and James, M. (1983) Curriculum Evaluation in Schools. London: MacKay of Chatham plc, Kent.

McLaughlin, M. and Talbet, J. (2001) Professional Communities and the Work of High School Teaching. Chicago University: Chicago Press.

McNeil, J. (1990) Curriculum: A Comprehensive Introduction. USA, Harper Collins Publisher.

MOE (1997) Educational Sector Development Program I. Addis Ababa: EMPDA.

" (2001) Educational Sector Development Program II. Addis Ababa: EMPDA.

" (2002) Educational Management, Structure and Communities Participation Policy Guideline. Addis Ababa: EMPDA. (Translated From Amharic)

" (2006) Educational Sector Development Program III. Addis Ababa: EMPDA.

Ornstein, A. and Hunkins, J. (1998) Curriculum: Foundation, Principles and Issues. New Jersey, Prentice Hall Company.

Olusegun (2001) Selecting a quantitative or Qualitative Research Methodology: An Experience. Educational Research Quarterly, 26,1, pp 3-10. / http://www.eagle.cal-mikehick/quality.html /

Patton, M. (1997) Utilization Focused Evaluation: Thousand Oaks: Sage Publications. Inc.

Pomeroy, D. (1994) Science Education and Cultural Diversity: Mapping the Field Studies in Science Education: 24, 56, pp. 49-73.

Pratt, D. (1980) Curriculum: Design and Development. New York: HBJP.

Pratt, D. (1994) Curriculum Planning: A Hand Book for Profession. New York: Harcourt Brace College Publisher.

Richardson, J. and Bernard, J. (1987) Methods and Materials in the Teaching of Science. Review of Educational Research. New York: AMS, Reprinting Company 18, 4.

Robert, H. et al (1983) Assessing Teachers Planning Abilities. Journal of Educational Research 77, 2.

Sayler, Alexander and Lewis (1981) Curriculum Planning. New York: Holt Rinehart and Wit son.

Sayler, J. et al (1980) Curriculum Planning for Better Teaching and Learning. New York: Holt, Rinchart and Witson.

Scheerens, J. and Bosker, R. (1997) The Foundation of Educational Effectiveness. New York: Elsevier Printing Press.

Schermerborn, R. (1989) Management for Productivity. New York: John Wiley and Sons, Inc.

Shiundu, J. and Omulando, T. (1992) Curriculum Theory and Practice in Kenya. Nairobi: Oxford University Press.

Sifuna, N.D and Otiende, E. (1994) An Introductory History of Education. Nairobi: College of Education: Nairobi University Press.

Snyder, J. et al (1996) "Curriculum Implementation" in Jackson. Hand Book of Research on Curriculum: New York: Mac Millan.

Solomon Areaya (2000) The Evaluation of Implementation of Grade 8 Mathematics Syllabus in SNNPR. The Case of Sidama Zone. /Thesis from AAU /

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

Tekeste Negash (1990) The Crisis of Ethiopian Education: Some implicational for National – Building. Sweden: Department of Education Uppsala University.

Teshome Wagaw (1979) Education in Ethiopia: Prospect and Retrospect. Ann Arbor: the University of Michigan Press.

Transitional Government of Ethiopia (1994) Education and Training Policy. Addis Ababa: EMPDA.

UNESCO (1999) Private Education in Sub-Sahara Africa; A re-examination of theories and concepts related to its development and finance. Paris International Institute for Educational Planning / IIEP.

UNESCO (2003) Policy Guideline for Secondary Schools Science and Technology Curriculum in Developing Countries. Paris: International Institute for Educational Planning/ IIEP.

UNESCO (2004) Report on the Development of Education in Ethiopia, to forty-seventh session of international conference on Education 8-11 sep. 2004: Geneva.

Vashist, R.P (2005) Secondary School Curriculum. New Delhi: Ajay Velma, Common Wealth Publisher.

Wakshum Mekonnen (2001) The Potential of Information Technology in Education. IER/AAU Flambuae 8, 2: AAU printing press.

Weiss, R. (1994) A Profile of Science and Mathematics Education in the United State. USA: Horizon Research Inc.

Wossenu Yeman (2001) Managing the Teaching Staff in the Public Primary School. AAU/IER Flambeau: 6, 2: AAU Printing Press.

Appendix A

ADDIS ABABA UNIVERSITY

SCHOOL OF GRADUATE STUDIES

Department of Curriculum and Teacher Professional Development Studies

"The Implementation of Science Curricula in Missionary Owned Secondary Schools of Ethiopia: The Case of Catholic Church Schools in East Shoa, Oromia Regional State."

Interview Protocol for Principals

Date_____

Time Interview Started_____

Time Interview Ended_____

I. Introduction

This interview guide is presented to generate pertinent data concerning how missionary owned secondary schools implement the science curriculum vis-à-vis the Education and Training Policy of Ethiopia and to identify the challenges they have encountered in implementing the science curriculum of grade 9 and 10. It is my belief that in generating data for research purpose due attention should be given to the ethical issues. Accordingly the following ethical considerations are presented to be discussed with research participants' ahead of getting into the actual interview.

- Your participation in this study is on voluntary basis.
- You have the right to withdraw, to change your ideas or to edit your recorded ideas.
- While the information you give belong to you, the interpretation totally belongs to me.
- Your anonymity and confidentiality of you information holds the heart of this research ethics.

Thank you in advance!

II. Issues

1. How do you examine the activities of missions (Catholic Church) in education sector of Ethiopia in general and particularly in implementation process of curriculum materials?
   - Provision of accesses, cooperation with governmental bodies, their duties and responsibilities, their commitments and others.
2. How do you evaluate the performance of science teachers in achieving the intended goals of the curriculum in terms of their knowledge, attitude and skills?
   - Following of teaching methods and assessment methods specified in curriculum materials.
   - Their competency to utilize the school and/or environmental resources.
   - Their willingness and readiness to give academical assistances for their students.
3. How do you perform your tasks as a director of the school to lead the organization through facilitating, coordinating, supporting and motivating of teachers as well as students with regard to the teaching-learning of science subjects?
4. Are physical facilities for the teaching learning processes in general and in particular for science subjects developed (availability, relevancy and utility) in your school?
   - Desk, chair, blackboard, library, laboratory, information and communication facilities and others.
5. How do you evaluate the nature of school management structure to facilitate the teaching- learning process of science subject?
   - Putting of duties and responsibilities for different parties.
   - Coordinating the resources.
   - Role relationship with governmental bodies.
   - Problem solving capacity.
   - Communication channel among school communities.
6. Is your organization providing the appropriate support to you and science teachers to achieve the objectives of education and training policy of Ethiopia?
   - Professional development.
   - Supply of materials for the school activities.
7. What the school is doing well to implementing the science curriculum of grade 9 and 10? i.e good practice or experiences of the school.
8. What challenges you and/or your school has faced in implementing the Education and Training Policy in general and the science curriculum in particular?
9. What do you think as suggestions that help to alleviate those challenges (if any) and/or to keep up its successes (if any)?

Appendix B

ADDIS ABABA UNIVERSITY

SCHOOL OF GRADUATE STUDIES

Department of Curriculum and Teacher Professional Development Studies

"The Implementation of Science Curricula in Missionary Owned Secondary Schools of Ethiopia: The Case of Catholic Church Schools in East Shoa, Oromia Regional State."

GUIDE FOR FOCUS GROUP DISCUSSION WITH SCIENCE TEACHERS

Date _____

Time FGD started_____

Time FGD ended _____

Number of participants _____

I. Introduction

This FGD guide is presented to generate pertinent data concerning how missionary owned secondary schools implement the science curriculum vis-à-vis the Education and Training Policy of Ethiopia and to identify the challenges they have encountered in implementing the science curriculum of grade 9 and 10. It is my belief that in generating data for research purpose due attention should be given to the ethical issues. Accordingly the following ethical considerations are presented to be discussed with research participants' ahead of getting into the actual discussion.

- Participants are encouraged to discuss their opinion. There is no right or wrong answers and difference of opinion are perfectly accepted. (the information is belong to you, the interpretation totally belong to me)
- Both positive and negative arguments are welcomed.
- Notes are being taken during this discussion so that an accurate summary can be prepared. All comments are strictly confidential.

Thank you in advance!

II. Issues for FGD

1. Let us discuss on the activities of mission schools in education sector of Ethiopia in general and particularly in implementing of curriculum materials?
    a. Provision of accesses, cooperation with governmental bodies, their duties and responsibilities, their commitments and others.

2. Would you discuss about the performance of school principal with respect to main duties and responsibilities prescribed in policy guideline of MOE?
    b. Guiding the teaching-learning activities.
    c. Supporting the teachers (technical, psychological, professional etc)
    d. Supervising the teaching learning activities for feedbacks.
    e. Facilitating the utilization of school resources.

3. Would you discuss your own performances in the whole school activities with respect to the prescribed tasks in policy guidelines and/or curriculum materials?
    - Employing of prescribed implementation strategies.
    - Participating in co-curricula activities.
    - Supporting students'.for better achievement.

4. Let us discus about the readiness and willingness of grade 9 and10 students towards learning of science subjects?
    - To learn more about science subjects.
    - To refer more reference books.
    - To participate in science clubs.

5. What points would you like to comment on material resources regarding their availability, relevancy and utilization for the teaching learning processes of science subjects?
    - Infrastructures (desk, chair, blackboard, notice board...)
    - Curriculum materials (policy guidelines, syllabi, teachers' guide, textbook ...)
    - Instructional facilities (laboratories, library and ICT)

6. Would you discus the performance of your organization in facilitating the teaching learning processes of science subjects?
    - The nature of school management structure.
    - Communication channel among school communities.
    - Provision of staff development programs.

7. Would you forward the good experiences and/or the bad practice of your schools in implementing of the science curriculum?

Appendix C

ADDIS ABABA UNIVERSITY

SCHOOL OF GRADUATE STUDIES

Department of Curriculum and Teacher Professional Development Studies

OBSERVATION NOTE

This observation note is used to evaluate the activities of selected schools in terms of translating the intended curriculum materials into practice from the point of views of researcher in terms of the following items:-

- To examine the activities of teachers and principals in the school whether it is in line with the prescribed duties and responsibilities or not.
- To assess the attitude of students towards learning of science subjects as a result of implementation practice of the schools.
- To evaluate the availability, relevancy and utilization of material resources in the school.
- And, assess the commitment of school as an organization to materialize the planned curriculum materials into practice.

Appendix D

ADDIS ABABA UNIVERSITY

SCHOOL OF GRADUATE STUDIES

Department of Curriculum and Teacher Professional Development Studies

Questionnaires for Science Teachers

I. Introduction

The purpose of this questionnaire is to collect information about the successes and the challenges of missionary owned secondary schools come across in implementing the science curriculum (biology, chemistry and physics) of grade 9 and 10. The information to be collected through this questionnaire will be **used only for research purpose.**

I, therefore, kindly request you to provide genuine information for it highly determines the success of the study.

I am very much grateful to you as well as your organization for kindly cooperation.

Thank you in advance!

Background information (No need of writing your name)

Region/ Zone/ Town you teach_____

School Name_____

Grade (s) you teach_____

Subjects (s) you teach_____

Your qualification_____

Year of services_____

PART I

Direction: Please respond for the following questions either by circling the letter of your choice and/or writing a complete answer on the space provided.

1. How do you rate the competence of school director in guiding of you or orienting of your duties and responsibilities for better achievement of your school tasks?
   A) Above sufficient B) Sufficient C) Insufficient
2. How do you rate the competence of school director in supporting (technical, psychological, professional etc) of science teacher according to policy guideline?
   A) Above sufficient B) Sufficient C) Insufficient
3. How do you rate the competence of the school director in creating or facilitating of cooperative learning environments for mutual sharing of experiences among science subjects teachers?
   A) Above sufficient B) Sufficient C) Insufficient

   If you answer A or b for the above question (3) describe the advantage you gain from it _____
   _____
4. How do you often discuss issues of science curriculum implementation with school principal?
   A) Frequently B) Rarely C) Not at all
5. How do you often hold department meeting in relation to the teaching learning of your respective subjects?
   A) Frequently B) Rarely C) Not at all
   If you answer A or b for the above question (3) describe the advantage you gain from it _____
   _____

6. How do you rate the competence of school principal in terms of supervising the teaching learning process of science subjects for feedback?
   A) Above sufficient B) Sufficient C) Insufficient

   If you answer A or b for the above question (4) describe the advantage you gain from it _____
   _____
7. How do you rate the competence of school principal in terms of his skill of facilitating the utilization of resources (human, material, time and finance)?
   A) Above sufficient B) Sufficient C) Insufficient

8. To what extent do you use instructional methods or techniques as suggested in the respective curriculum materials in achieving the intended objectives?
   A) Frequently B) Rarely C) Not at all
9. How do you examine the number of periods you teach in a day or a week with your teaching effectiveness?
   A) Over load B) Fair load C) Under load

Based on your response for the above question (7) mention the advantage or disadvantage of it_____

_____

10. How do you often suggest or instruct students to use reference materials for your respective science subject?
    A) Frequently B) Rarely C) Not at all
11. How do you rate the availability of reference books for science subjects in the school library against the number of students?
    A) Adequate B) Inadequate C) Not existent
12. How do you rate the appropriateness and relevancy of reference books in the school for science subject you teach in the school?
    A) Highly relevant B) Relevant C) Irrelevant
13. How do you often discus issues of teaching and assessment methods you employed in the classroom with your students?
    A) Frequently B) Rarely C) Not at all
14. Does the school have access of laboratories for each science subject?
    A) Yes B) Partially Yes C) No
15. How do you rate the appropriateness and relevancy of material resources (tools, equipment, chemicals or reagents) in the school laboratories for science subject you teach in grade 9 and 10?
    A) Highly relevant B) Relevant C) Irrelevant
16. How do you often use the available laboratory resources for the teaching learning of process of your respective science subjects?
    A) Frequently B) Rarely C) Not at all

If you answer C for the above question (13), please indicate your reason of not using of it_____

_____

17. Does the school have access of information and communication facilities (Plasma) for the teaching learning of science subjects?
    A) Yes B) Partially Yes C) No
18. What is your opinion about the current management structure of your schools in facilitate the implementation of science curriculum?
    A) Very convenient B) Convenient C) Not convenient

19. How do you rate the capacity of your school management structure in coordinating the available school resources (human, material, time and finance) for effective implementation of the science curriculum materials?
A) Very convenient B) Convenient C) Not convenient
20. How do you rate the capacity of your school management structure in creating of positive role relationship with governmental bodies for implementing the education and training policy of the country?
A) Very convenient B) Convenient C) Not convenient
21. How do you rate the capacity of your school management structure in solving of problems arise in the teaching learning process?
A) Very convenient B) Convenient C) Not convenient
22. Have you participated in in-service training programs (seminar, workshop or any other) in relation to science curriculum implementation of grade 9 and10?
A) Yes B) Partially Yes C) No
23. Do you think that the in-service training programs you participated (if any) have positive impact on your performance?
A) Yes B) Partially Yes C) No
24. Do you think that you need more additional in-service training programs to increase your classroom performance?
A) Yes B) Partially Yes C) No
25. In your school, what are the major successes of you or your organization achieved in implementation of science curriculum?

_____

_____

26. In your school, what are the major challenges that hinder the effective implementation the science curriculum?

_____

_____

27. What do you recommend to improve the teaching learning process of science curriculum in your school?

_____

_____

PART II

Direction: please mark with a tick (√) your responses in only one of the three alternatives by assessing the availability of facilities in the school.

No	Items	Adequate	Inadequate	Non existence
1	Policy guideline			
2	Science syllabi			
3	Teachers guide			
4	Students text			
5	Desk and chair in classroom			
6	Desk and chair in laboratories			
7	Desk and chair in the library.			
8	Chalkboard in the classroom			
9	Notice board in the school			
10	Teachers desk and chair in the classroom			

Appendix E

ADDIS ABABA UNIVERISTY

SCHOOL OF GARADUATE STUDIES

DEPARTMENT OF CURRICULUM AND TEACHER PROFESSIONAL DEVELOPMENT STUDIES

Questionnaires for grade 9 and 10 students

I. Introduction

The purpose of this questionnaire is to collect information about the successes and the challenges of missionary owned secondary schools come across in implementing the science curriculum (biology, chemistry and physics) of grade 9 and 10. The information to be collected through this questionnaire will be **used only for research purpose.**

I, therefore, kindly request you to provide genuine information for it highly determines the success of the study.

I am very much grateful to you as well as your organization for kindly cooperation.

Thank you in advance!

Background information (No need of writing your name)

School Name_____

Your Grade Level _____

PART I

Direction: Please respond for the following questions either by circling the letter of your choice and/or writing a complete answer on the space provided.

1. How often do the science teachers use different teaching methods (lecture, demonstration, group discussion, laboratory work etc) to teach their respective science subjects?
   A) Frequently B) Rarely C) Not at all
2. How often do the science teachers guide you to observe and discover rules and generalizations by yourself?
   A) Frequently B) Rarely C) Not at all
3. How often do the science teachers relate their lesson with your life activities or environmental realities?
   A) Frequently B) Rarely C) Not at all
4. How often do the science teachers use different assessment techniques (oral, class work, homework, mid exams, final exams etc) to check your understanding of the contents of the subjects?
   A) Frequently B) Rarely C) Not at all
5. How often do you discuss issues related to the teaching learning process of science subjects with your teachers?
   A) Frequently B) Rarely C) Not at all
6. How do you often discuss issues of curriculum implementation with the school principal?
   A) Frequently B) Rarely C) Not at all
7. How do you often discuss issues of science curriculum implementation with your peers' (others students)?
   A) Frequently B) Rarely C) Not at all
8. How often do the science teachers are available and will to provide assistance to you in relation to their subjects?
   A) Frequently B) Rarely C) Not at all
9. Do you have a positive attitude or feeling towards learning of science subjects?
   A) Yes B) Partially Yes C) No
   Please, justify the reason for your answer_____
   _____
10. What do you think the level of difficulty in learning of science subjects for your respective grade?
    A) Too difficult B) Medium C) Not difficult
    Please, give the reason for your response_____
    _____
11. To what extent you participate in different science clubs (bio., chem., phy. etc) activities in your school?
    A) Frequently B) Rarely C) Not at all
12. Do you have interest to study the natural science field in your future career?
    A) Yes B) Partially Yes C) No
    Please, give your reason for your answer_____

13. How do you rate the availability of reference books for science subjects in the school library against the number of students?
A) Adequate B) Inadequate C) Not existent
14. To what extent you use reference books for studying of science subjects from the school library?
A) Frequently B) Rarely C) Not at all
15. Does the school have access of laboratories for each science subject?
A) Yes B) Partially Yes C) No
16. How do you often the teachers utilize the available laboratory resources for the teaching learning of process of your respective science subjects?
A) Frequently B) Rarely C) Not at all
If you answer C for the above question (13), please indicate your reason of not using of it_____
_____
17. Does the school have access of information and communication facilities (Plasma) for the teaching learning of science subjects?
A) Yes B) Partially Yes C) No
18. In your own opinion, what are the major challenges that hinder the effective implementation the science curriculum?
_____
_____
20. What do you recommend to improve the teaching learning process of science curriculum in your school?
_____
_____

PART II

Direction: please mark with a tick (√) your responses in only one of the three alternatives by assessing the availability of facilities in the school.

No	Items	Adequate	Inadequate	Non existence
1	Desk and chair in classroom			
2	Desk and chair in laboratories			
3	Desk and chair in the library.			
4	Chalkboard in the classroom			
5	Notice board in the school			
6	Teachers desk and chair in the classroom			

Appendix F

Transcript of a principal interview (Sample)

Date: Apr. 8, 2007

Time interview started 4:00 local time

Time interview ended 5:54 local time

Q1- How do you examine the activities of missions (Catholic Church) in education sector of Ethiopia in general and particularly in implementation process of curriculum materials?

- **Provision of access, cooperation with governmental bodies, their duties and responsibilities, their commitments and others**

- As to me, the Ethiopia Catholic Church contribute significant role in provision of educational access through out the country. This means that the church support the sector in multiple ways. For instance, it provides different educational materials as donation to MOE, Zone bureaus, woreda offices and schools. Beside, the church directly involve in construction of schools that are financed and administered by ECCS. Hence, the church provides access of education in collaboration with others stake holders, particularly with governmental bodies.
- The responsibilities and duties of the church school, as to me is more than any thing preparing of children or students for the work environment, specifically preparing of student for national examination according to ETP of Ethiopia. Means, the church schools as others school implement the curriculum that are prescribed or prepared by MOE.
- With regard to collaboration trend between mission schools and governmental bodies. According to my opinion, it is not convincing. In theoretical position both parties stress the importance of collaboration trend, but in practical cases; the government provide curriculum material through Zone Education office and facilitate the process of licenses for the

school. In general, the governmental bodies didn't frequently supervise the activities of mission school. But, they rarely supervise for determining schools performance. Hence, I strongly recommended (for both parties) to help each other to bring the intended school goals for the development of this nation.

Q2- How do you evaluate the performance of science teachers in achieving the intended objectives in terms of their knowledge, attitude and skill?

- **Following teaching methods/assessment method specified in curriculum materials.**

- To answer this question, I have to start with the selection criteria of teachers. This organization highly emphasizes the knowledge, attitude and skill of teachers to teach in this school. Means, the priority given to highly for competent teachers, next the moral and ethical issues are considered. Thus, teachers who passed thought these steps can effectively follow the teaching methods or assessment techniques set in curriculum materials. But here, I don't mean that our science teachers always follow the stated teaching strategies in curriculum. I, as director of the school discuss about this issues with teachers and students. Thus, I can suggest that from the discussion the factors not to employ the teaching methods are: teachers and students background, over load of time table, support from the organization, the nature of national examination etc.

- **Their competency to utilize school /environmental resources/**

- This school has adequate resources for science subjects in the library and three of laboratories. But, as to me the utilization of this resource by science teachers is weak as comparing with the availability of resources. This might be due to the problems I have indicated above.

Q. But, teachers in FGD have raised the problems related to relevance of materials in school, so what do you say about this?

- I don't agree with this statement. Since, I believe that our schools have the appropriate material resources in the school, but the none utilizing practices of this resource is not related to their relevance and appropriateness. I don't want to say more in this regard since I am not science teacher.

➢ **Their willingness and readiness to give academic assistances for students.**

- One thing that make our school different form others (governmental schools) is the presence of high supporting culture between school communities (parents, teachers, students, principals etc). Particularly, teachers (not only science) are will and ready to give academicals assistances for students.

Q. Can you elaborate it more, please?

- Ok, in this school there is always study time table in parallel with normal academic schedule. While, the teacher give assistances like make up and additional time study for students. Hence, as to me this culture of supporting each other is common in this school which is the result of willingness and readiness of our teachers.

Q3- How do you perform your tasks as director of the school to lead the organization through facilitating, coordinating, supporting and motivating teachers as well as students with regard to teaching- learning of science subjects?

- I think, it is better to ask this question other parties or school communities about my activities in the school. But I want to tell you one fact: as director of the school I have tried my best to lead the teaching- learning process in the school through orienting tasks for teachers, solving problems with teachers and students, supporting teachers and students to achieve the intended objectives. To be honest, I don't want to tell you false statements by saying, my activities in the school are as expected from the position which means the problems that hiders my activities in the school are many

like the structure of the school is highly interwoven with the church management structure, means the position have not full autonomy and power as it is expected. Beside, pressure from parents, teachers and students limit (create stress) on my activities.

Q4- Are physical facilities for the teaching- learning process in general and in particular for science subjects developed (availability, relevancy and utility) in your school.

- **Desk, chair and black board.**

- Since the number of students in this school is about 200, there is no doubt that our school is highly equipped with these infrastructures

- **Library, laboratories and ICT facilities**

- This school has one library, three laboratories for each science subjects, one pedagogical center for all subjects, one drawing room which is according to the requirement of MOE. That is, all rooms are well furnished and have the necessary materials which are relevant for the corresponding subjects. But, here I need to stress the absence of plasma facilities. The absence of this facility in our school is not due to the problem of the school, but the problem is from governmental bodies: Telecommunication Agency, MOE, EMA etc. These bodies are involved in installation of ICT for governmental schools through out the nation. However, they didn't consider our school as communities school which serve the people of this nation so that they didn't give us the chance of having ICT facilities. Even up on the request to the program installation by church own budget, these bodies didn't respond for the question of having the facility in our school.

Q5- How do you evaluate the nature of school management structure to facilitate the teaching- learning process of science subjects?

- **Putting of duties and responsibilities for different parties.**

- As I have said early, the structure of school management is highly interwoven with church. Hence, I reserve to say that the current management structure of our school put the duties and responsibilities of different parties clearly. I doubt on it.

➢ **Problem solving capacity**.

- With regard to this issue, again I need to associate with the above statements that the school has no full autonomy in coordination, allocating and leading resources of the school. Due such complex nature of the structure, we can't always easily solve problems that arise in the teaching-learning process since such problems are solved through such resources.

Q- How do you solve problems that arise in the T-L?

Most of the time we solve problems that arise in the teaching- learning process through discussion with students and teachers so that we are able to solve problem in such ways. But, those problems which need decision from higher school administrator take long time and resources. As result, it is too difficult to say that the current management structure can solve problem as expected.

➢ **Communication channel among school communities**.

- I have said more with regard to the existence of good communication channel in this school. It may due to the existence of such good trend our students score good grades in national examinations (ESGCE) since the current management structure developed these culture, we do have culture of solving problem with students, teachers, parents or any other through discussion, or I can say this practice can be consider as one of our strength to implement the curriculum material effectively.

Q6- Is your organization providing the appropriate support to you and science teachers to achieve the objectives of ETP?

➢ **Professional development**.

- I don't know how I can express my feeling with this regard. Generally one of good practice of mission school is providing of professional development

programs. They invest to upgrade the qualification of teaching staff through continuous staff development programs. For instance, I assigned as director of this school staring from 2001 since then my organization (the church) has arranged different in service training programs in relation to the school management system through summer program or at any time. So that I can say that I perform my duties in this school base on knowledge and skill, I acquired through these in service training programs or I found the training programs as important for the position as well as for my performance as school director.

Q7- What the school is doing well in implementing the science curriculum of grade 9 and 10? That is practice or experience of the school?

- More than any thing our school is able to prepare student for national examination. Accordingly, our students score good grades in science subjects. This implies that the implementation strategies we use in this school have its own contribution for the achievement of students. The physical facilities this school is adequate as comparing with the number of students. Since we do have small number of students, we are able to know the interest of individual interests towards science subjects. The additional study time for these subjects also can be consider as one of good practice or experience of this school through which we develop culture of discussing or solving problem for any academic problems in any subject. The school is committed to support the implementation of science curriculum of grade 9 and 10 through allocating of more budgets for these subjects since these subjects need supply of more additional resources.
- The school invites guest teachers for these subjects to help students. These guests are sponsored by the church or they are missionaries who want to help us through education. This is the base of development of any nation.

Q8- What challenges you and /or your school has faced in implementing the ETP in general and the science curriculum in particular?

- As any others schools, this school have faced different challenges in implementation of ETP. But, the main problems are:- the mission schools are considers as school of others (foreigners), but, the reality is they are the school of poor people which are helped missionaries. Hence, this school didn't involved in curriculum development process that is they ordered to implement the curriculum which are prepared by others so that implementing the curriculum without involving in development process that is they ordered to implement the curriculum which are prepared by others so that implementing the curriculum with out involving in development process is very difficulty task.
- Most students consider science subjects of difficulty particularly physics and chemistry since these subjects need some skill of mathematics so that the awareness of students to wards these subjects has its own contribution for limitation of successful implementation of the curriculum.
- Almost there is no clubs activates n this school which has also affect the teaching- learning process of science subjects. Thus, we have to develop mechanisms to use clubs for science subjects.
- Though I don't have enough evidence to say that the science curriculum is highly occupied with large contacts and methods which are difficulty to cover the whole text book in a given academic calendar so that either we have to change the content of the text or to search other mechanism to alleviate this problems with concerned bodies like ICDR. Our science teachers' performance by itself has its own limitation on successful implementation trend of our school.

Appendix G

Transcript of a FGD

Date: Apr. 26, 2007

Time FGD started 8:00 local time

Time FGD ended 10:30 local time

Number of participant 4

Q1- Let us discuss on the activities of mission schools in education sector of Ethiopia in general and particularly in implementation of curriculum materials?

- **Provision of accesses, cooperation with governmental bodies, their duties and responsibilities, their commitments and others.**

T1- It is fact that the government alone can not be able to provide educational access for its entire citizen as it is intended in "Millennium Development Goals." Hence, different parties should involve in providing access of education through out the country, particularly those of rural area. Among these parties the ECCS is one which creates access of education in this country in collaboration with government. So that it is possible to say that the mission schools are committed for education sector of Ethiopia.

T2- Starting form their introduction to Ethiopia, different missionaries (probably came from abroad) tried to establish formal schools, of course, history tell us that their major concern to introduce their spiritual ideology or culture to Africa people. But, I believe that for whatever they came to Ethiopia they are able to support as one party for expansion of education in the country. They are committed to help as through education. Hence, as to me they involved in education sector and more recently in implementation of the prescribed curriculum materials.

T3- More have been said by my friends. But, I want to add some thing the responsibilities and duties of the church school. As to me, it is more than any thing preparing of children (students) for the work environment through education. That is, the schools prepare students for the work force of this nation. This is the major theme of education in any nation.

Q2- Would you discuss about the performance of school principal with respect to main duties and responsibilities prescribed in policy guideline of MOE?

- **Guiding the teaching – learning process, supporting the teachers (technical, psychological, professional etc), supervising the teaching – learning activates for feedback and facilitating the utilization of school resources.**

T4- I can say that our principal perform his task as it is expected from the position, with certain limitation. That is, according to my opinion, the principal has potential of leading the most school activities through his talent which means he properly guide us when, how, what to do our tasks in the school. Particularly his has potential of supporting us through providing of morals.

T2- The director of this school may has the talent of leading the school, but I doubt that he has used all of his talents. I mean here, his activities were limited only certain aspects such us controlling of students discipline and preparing of time schedule for teaching – learning process. He has no so much promising power to lead the school as expected from the position. Hence, I can say that the participant don't utilize his potential for betterment of school activities. This may be due the fact that his immediate base is not academicals, but assigned based on the contribution he made for the church that is who is "Kes".

T1- I do have the same response with T2, which is the activities of principal's were only controlling of teachers and student in terms of their physical appearance, with out focusing on what is going on class room situation. There is no time, I remember the director supervise our lesson for feedback. This might be

due the fact that problem of school structure, rather than lack of talent form the principal. I don't also remember any time that the principal was able to give us technical or professional support for us, but it may be due our commitment.

T3- ...the director of this school did his tasks properly as it is stated I the curriculum materials, but their may be some challenges his faced while doing. But in my opinion, I perform most of my tasks through the guidance, support, coordinating skill or any other I received from the director. I also believed that our students also benefited from the high performance of the director, which is why they properly learn each subject in the school. Means, he (the principal) prepare time schedule for the teaching – learning process, encourage us to do better, discuss different issues with us, communicate effectively with external bodies, facilitate to utilize school resources for the teaching – learning process etc. hence, I have no doubt with regard to principal's performance.

Q1- Would you, please mention the challenges you raised?

- The economy (finance head) of the organization is "kes" who do have the concept of schooling so that he most of the time don't accept the proposed financial requests or any other materials. As result the director don't solve problem that arise in relation to finance and material resources.

Q3. Would you discuss your own performance in the whole school activity with respect to the tasks prescribed in policy guideline and/or curriculum materials?

- **Employing of stated implementation strategies, participating in co-curricula activities, supporting students for better** achievement.

T2. To be frank, there is no one who always applies the suggested teaching method in curriculum material, the same is to me. I can't be able to utilize always the suggested method to teach subjects. For instance in my subject syllables it is stated to use demonstration, discussion, lecture, laboratory work etc. But, I rarely use these methods in the class since there are a number of

factor that hinder me to use these methods. Among those factor; background of students, over load ness of class (I teach four different section from grade 9 to 12), material problem etc. In general I can say that due many problem it is not possible to teach the science subjects through prescribed teaching methods.

T3. It is ideal to say that I always utilize the recommended teaching methods in the classroom.

But, I don't mean that I couldn't use them. To me, as possible as I employ the student centered teaching method in the classroom, which need the active participation of students in the lesson.

Really I am interested to employ such methods since the method by it self teach me from my students. Thus, though I frequently use the leeture method to teach my subject, I rarely employ the student-centered method of teaching.

Q. Why don't you always apply the suggested teaching methods?

Because the suggested teaching method don't allow me to cover the whole content of the text book since most of the suggested methods need time and resource.

T2. Let me focus on second and third issues since my friend said a lot with regard to the teaching methods. In our school there is only culture of forming clubs for different subjects at the begging of each academic calendar. But, we are net able to observe any club activities for science subjects Hence, I want to stress: there is no club activity for science subjects through which student may gain different knowledge or share their experience How ever, our school always focus on entertimental clubs like sport club, music club, etc. which means they don't give attention for science subject clubs. Thus, we(teachers) as well as students didn't gain the advantage of science clubs due lack of commitment from school administrative bodies.

With regard to supporting of our students, I can say that we do have good culture of supporting them. For instance, except one day per week, all

teachers are available and will to give academicals assistance through out the day in the school. The schools itself also give some additional payments for teachers to encourage this activities. This in general implies that in our school the teacher support teachers for their additional support.

T4. The suggested teaching methods for my subject need resources since it is chemistry-But is this school there are only excess and expensive material resources which are not relevant for chemistry subject of grade 9 and 10. Hence, there is no time I used the laboratory to teach my subject, Rather , I use the lecture method as I learn in the high school or university. To use such suggested method, first we need to examine the relevance and appropriate ness of resources.

Q4. **Let us discuss about the readiness and willingness of grade 9 and 10 students towards learning of science subjects.**

*** To learn more about science subjects, to refer more reference book and to participate in Science Clubs.**

T4. I can say that our grade 9 and 10 students have interest to learn science subjects since this level is critical for them (they prepare for national examination) so that It is possible to say that our students have positive attitude to learn my subject particularly when I teach them about sexually related issues like reproduction system or menstruation cycle almost the whole students become eager to participate in the teaching learning process. But, while teaching of other contents, even though all students are not eager, at least some of them able to follow the lesson.

T2. One of the challenges to implement the prescribed teaching methods is related with this issue. i.e students interest developed to wards this subjects. For instance, I am physic teacher in this school. I don't have seen positive attitudes to wards this subject, from majority of students. That is majority of student consider the physic subject as abstract and difficult subject, as result they don't even properly follow the physic lesson or they don't have interest to

read more additional reference, even I instruct them to read different content from reference book. However, I (as teacher) always try to encourage them (students) or motivate them to learn physic subject.

Q. What mechanism you employ to bring such attitude on your students?

T2 As much as possible I relate the lesson with the student's real life situation or I tough the subject in simple and easy ways to my students. Beside, I frequently advice them to read about physics.

T3. I also have the same experience with T2. I teach Chemistry for grade 9&10 since, the concept of this subject need the concept of mathematic most students, particularly lower achiever students don't have so much promising attitude towards this subject. This is expressed by their devotion and attention in the teaching-learning process. When I taught them, most of them think other thing i.e they are physical present in the classroom, but mentally they are absent from the classroom.

Q. What mechanism you employ when you look such problems in the classroom?

Of course, as teach I tried my best to alleviate such problem. For instance, I may ask question suddenly from the content of the lesson or I may change the teaching method I employ in the classroom (from lecture to discussion or vise verse).

Q5. What points would you like to comment on material resources regarding their availability, relevance and utilization for the T-L processes of science subjects?

Instructional facilities (laboratories, library and ICT)

T1.- I think when you (the student researcher) came to this school, you appreciate the physical environment buildings, laboratories, computer room, staff entertainment areas... But, when you stay more here, you may understand that most of these things are take or have nothing to do for the betterment of the teaching learning processes. Let me come to laboratories materials as I said early that the laboratories are equipped with plenty and

expensive materials, but we teachers have faced a great challenge to use them. As external body you may not understand me, but the fact is that most of materials in our laboratories are not relevant for our science subjects. This may be due the fact that materials are donated or purchased from abroad that doesn't consider the curriculum material of grade 9 and 10 or Ethiopian education system.

T3. I know that teaching chemistry with the help of practical work is very interesting for students. Since when I was student, I remember my feeling towards such teaching methods. Our school seems having excess materials in the laboratory but I couldn't found relevant chemicals, apparatus and equipment for grade 9 and 10 chemistry. As result I couldn't be able to teach the subject through laboratory work as required.

Q. Can you give us practical example for your response?

Yes, in chemistry laboratory I can show you that different apparatus which I don't know them how to use, but, when you look the purchasing price, you don't bereave it since in Ethiopia context such cost may build /construct at least two high schools with their furniture's. So that I definitely stress that our schools don't have relevant materials for teaching of science subjects.

Q6. Would you discuss the performance of your organization in facilitating in facilitating the T-L Processes of science subjects?

*** The nature of school management structure, communications channel among school communities and provision of staff development programs.**

T2. Really, I have to express my appreciation to this question since these issues are very important to solve all of problems in this school. First, the major problem in the T-L activities is the management structure of the school; this school performs most of its activities with out having a clear structure. The institutes give priority for ethical issues, rather that academic issue. The "kes" /head of church at any time or place may interfere the teaching learning process. For instance, before three days the school closed by the Head of the

church. This reason of closing the school is "Holiday" of Don Bosco". This implies that the school doesn't have a clear structure, after all the head of the church should not have power to interfere the academic activity of the school. Second, with regard to in service training program the school arranged for us. (Science teachers). The school arranged different in service training programs for us. The trainings programs are most of the time don't interfere the normal academic schedule i.e. most training are arrange in break time. But, my opinion is about their purpose /significant I have doubt on if it may be due you the fact that the trainees were from abroad or missionaries who may have first or second degree in one of science subject. But, they any concept of science curriculum of Ethiopian secondary school.

Q. **Would you please justify your idea?**

Ok, for instance in last year summer we have participated in one workshop that is arranged by the church. The theme of workshop is to upgrade our performance, but nothing has been said with regarded to teaching learning activities in our school. The issue where about Christianity and Ethiopia, the education of Jesus, the activity of teacher from the point of bible etc. According to opinion, these issues may have their own role in our life, but I haven't seen any relation with my classroom performances.

T3. I also agree with T2.But, to make it clear our organization arranged different in service training program for us (teachers). But most of those training which I participated have not so much related to the implementation of any curriculum material, particularly with my subject. So that we can say that we did most of our tasks with the help of knowledge that acquired in preserves programs or through experience. We gain from out surroundings or though reading of different material that deal about Ethiopia science education system.

DECLARATION

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

Name: Elias Girma

Signature _____

Date July, 30/2007

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

Name: Solomon Areaya (Dr.)

Signature_____

Date _____