THE EVALUATION OF THE IMPLEMENTATION OF GRADE EIGHT MATHEMATICS SYLLABUS IN SNNP REGION: WITH SPECIFIC REFERENCE TO SIDAMA ZONE

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By
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ABSTRACT

The worth of a planned curriculum is ascertained through a thorough inquiry into its practicality and ultimate benefit. In view of this, the purpose of this study is to evaluate the implementation of grade eight mathematics syllabus and to identify the outcomes as well as the problems encountered in translating it into practice.

To this effect, four junior secondary schools were selected as sources of information from the nine weredas of Sidama zone in SNNPR. Within these schools all mathematics teachers of grade eight who are twenty in number, the school directors, and a total of 440 students were taken as actual sources of information. Questionnaires, classroom observation, and achievement test were the data collection instruments used to obtain information from the sources.

The results of the study indicate that the majority of teachers exhibited unfavourable attitudes towards the specifications of the syllabus. There are a considerable proportion of teachers who are assigned to teach mathematics at grade eight without the necessary qualification. The specifications of the syllabus are not also implemented in full. Most of the instructional procedures observed in the classrooms are teacher-centered. The dominantly used teaching strategies in the class rooms are writing on the black-board and teacher-directed explanation. Most of the mathematics class time is used for writing and copying facts of mathematics rather than doing mathematics.

Consequently, the implementation process of the syllabus is not effective in enabling students to have mastery of the subject matter.

Beauchamp (1968:132) and Fullan (1991:65) described that the success of curriculum implementation is weak; that is, many curriculums have been planned but much fewer have been systematically implemented. Many curriculums, even the well planned ones, will not be effectively implemented unless equal attention like their planning is given by planners for their implementation. Effective implementation requires parallel policies and procedures, to those that are addressed routinely for development. Many excellent curriculums have had insignificant results because their designers limited their horizon to the development of curriculum without a serious consideration of implementation (Pratt, 1980; Girox, 1981; Sounders and Graham, 1983; Gene, 1995).

In addition to this, as Gene and Carter (1995:174-175) noted it historically, the development of curriculum received the bulk of the resource, time, and attention. But for implementation to be successful, there must be a balance in the allocation of resource, time and attention. Development and implementation must be recognized and supported in terms of what they really require and cost.

Implementation requires recognizing and adjusting personal habits,ways of behaving, programme emphasis, and learning space. Ornstein and Hunkins (1998:293)elaborated this idea that successful implementation of curriculum results from careful planning, and planning in turn focuses on three factors: people, programmes, and organizations. Thus, implementation in its very essence seeks the coming together of people, material and programme into a cohesive organizational unit so as to carry out a curriculum's stated aims. This shows that the statement of good behavioural objectives, the selection and organization of contents and learning experiences alone will not bring about the desired behavioural changes in themselves unless it is implemented using appropriate strategies.

The implementation of a curriculum depends on many factors, such as people, programme, and organization. However,

the implementation of any curriculum predominantly depends upon the daily activities of the organizational members such as teachers, directors and administrators who are responsible for its implementation. If these members respond to influences other than the intentions of the developers, then even the most carefully planned and supported curriculum is unlikely to be implemented as intended (Adams in Fullan and Pomfrate, 1977: 335-336).

There are numerous factors that could influence the implementation of a curriculum, however, the teacher is the final decision maker concerning the actual learning opportunities provided to students as he/she is the person who interacts with the student at classroom level. Whether the curriculum is designed perfectly or poorly, its success or failure depends by large on the quality of the teacher's planning and implementation. If teachers do not understand and accept what is wanted, or if they are not willing to make a genuine commitment for its success, implementation will be hampred.

Implementation and evaluation are essential components of curriculum studies. Evaluation can be used to decide what instructional material and methods are satisfactory and where change is needed; it can be also used to judge how good the school system is, how good the individual teachers are (Cronbach cited in Stenhouse, 1975:98). Furthermore, one of the purposes of evaluation of implementation of a syllabus is to provide information for continuous on-going modification of the learning programme, and the other is to find out whether a syllabus really does achieve what it intends to achieve (Yeoman, G.D and Beck, A.W,1987:10). Hence, there is no sound reason as to why one has to wait for evaluation of the implementation of a syllabus until after its extended period of implementation. Lewy (1977:156) has described this as follows:

> "After a new curriculum or teaching method has been implemented, it is essential to undertake regular and systematic assesment of its effect-iveness on a half-year or yearly basis."

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Lewy went on describing that when a new educational programme is introduced, the role of evaluation become even more important in maintaining the effectiveness and quality of the new educational programme in action. That is in many curriculum centers throughout the world, evaluation is regarded as quality control measure for curriculum, instructional method, and procedures by identifying and detecting problems during implementation so that the effectiveness of the programme can be protected from deterioration. Therefore, evaluation has to be seen as a continuous process of collecting information and supplying feedback on what is being implemented and then to improve the programme rather than passing judgement.

Fullan in Lewy and David (1981:335) has substantiated this view by saying that "Evaluation at early stage (e.g., the first two years) should be directed at facilitating and improving the quality of implementation rather than making judgement about success or failure of the programme."

With these understanding of implementation and its barrier, we shall have a look at the importance of evaluating the implementation of our mathematics syllabus.

Since the introduction of modern education in Ethiopia (1908), mathematics has been taught in different forms at every level of education in the country (Punkhurst cited in Abebe Bekele, 1991: 47-48). It is also one of those subjects that is given attention by the New Education and Training Policy, specially at the level of primary education(Sector Strategy; P.15). Hence, in our education system the place of mathematics as a subject has been very significant.

No one doubts the importance of mathematics for our day-to-day life and for the development of science and technology in general. To increase production, technology has to be developed and to develop technology, mathematics has to be developed (Carpenter,T.P and Romberg,1986: 850). Technology, natural science and mathematics are basic elements of this world (Fennell,1995: 31-32). The concern, however, is whether students who are currently being taught mathematics in school

will have an adequate preparation for the scientific world of the twenty-first century.

The government of Ethiopia in 1994 based on its "Education Sector Strategy" declared the "Education and Training Policy" of the country. On the basis of this national policy, diffrent syllabi were developed, one of which is the mathematics syllabus of grade eight.

At present, both flow charts and syllabi are drafted by the ICDR and approved by regional representatives in a seminar called for this purpose (SNNP Regional Education Bureau, 1997:63). Though it is the right of the regions to prepare and implement the curriculum for primary education (MOE, 1988 E.C.:3; MOE, 1994), the current mathematics syllabus for grade eight was developed by ICDR as a national document and the responsibility of preparing the students' text book and teacher's guide has been given to regional states (Getu Kamiso, 1998:1). As a result of this, the Southern Nation Nationalities and Peoples Region has prepared a text-book for students and a teacher's guide for grade eight (SNNP,1998), and thus has implemented the syllabus in all of the primary schools in the region since 1991 E.C.

However, the effectiveness of the implementation of the syllabus is not yet studied except for the formative evaluation conducted by Getu Kamiso in ICDR (1998). One year of field trial and one year of total implementation are completed and a national examination was administered on the basis of the syllabus, and now it is another year of implementation. Hence, it is not too early to evaluate the implementation of this syllabus.

Regarding this, no direct study has been made upto now except for some points raises in relation to the instructional aspects of the subject (Seleshi, 1995; Asmamaw, 1993; Patrica,1994; Metasebia, 1999; Luna et al, 1995).

However, a follow-up study of the implementation of grade seven mathematics syllabus in some selected schools of Addis Ababa, and a case study of grade eight mathematics classroom

environment, both (term papers) made by the investigator have indicated the need for studying the implementation of mathematics syllabi of both grades 7 and 8 to see the match between the difficulty level of the contents and the maturity level of the students, and the unfavorable conditions of the classrooms. In addition to this, most mathematics teachers in grades 7 and 8 considered the syllabi as directives that come from the top without their participation in their preparation. Therefore, since the syllabus is the same in all regions, it is appropriate to evaluate the implementation of the syllabus and reveal the situation in SNNPR specifically in Sidama Zone where there is no direct study made in the area. The study will contribute input in improving the syllabus and subsequently other curricular materials.

1.2 Statement of the Problem

The purpose of this study is to evaluate the implementation of grade eight mathematics syllabus in selected schools and to see the outcomes as well as the problems encountered in translating it into practice. According to ICDR,the constituents of a syllabus are: objectives, contents, methods, media and evaluation techniques (ICDR,1995:18).

Research Questions

With these purposes, then, the study will attempt to find answers for the following five research questions:

1. Do teachers of mathematics in grade eight have postive attitude towards the design and specifications of the syllabus?

   Specifically towards the:

   - aims and objectives of the syllabus
   - the contents of the subject.
   - proposed teaching-learning activities in the classroom

2. Do mathematics teachers in grade eight use instructional guide-lines set in the syllabus effectively in the classroom? i.e.,
   - their capability of transmitting the contents of the subject in accordance with the guideline.
   - their use of teaching methods and techniques prescribed by the syllabus.
   - their teaching activities in the classroom.
3. How conducive is the learning-teaching environment in the school and the classrooms for the full and effective implementation of the syllabus?
4. Is the implementation of mathematics syllabus effective in enabling learners to have mastery of the subject matter?
5. What are some of the constraints which affect the implementation of the mathematics syllabus?

1.3 Significance of the Study

Evaluating implementation of a syllabus is a very important part of educational process for enhancing the standard of education. Both implementation and evaluation are continuous processes which go side by side. Evaluating implementation of a syllabus continuously helps to obtain evidences for the purpose of improving the shortcomings.

Hence, this study is important at least for the following three reasons:

1. Since the study area is limited to Sidama zone of the SNNP region,the findings can serve as reference for further broad and detailed investigation on the subject in the Sidama Zone of the SNNPR.
2. The region can benefit from the findings of the study for improving and facilitating the quality of the implementation process.
3. The concerned curriculum planners can benefit from this study by taking the findings as a clue to indicate what parts of the syllabus are being implemented well and what

1.6 Definition of Terms

Syllabus Implementation :- It is the process of putting the design and specifications of the syllabus in to practice in the classroom.

Evaluation :- It is a process of carfully collecting and treating data of what the curriculum/syllabus intends to do, what is provided in the environment, the interaction among students, teachers and instructional materials, the students' performance, and the merit and shortcoming seen by persons from divergent points.

Effectiveness of Implementation :- It is the actual use of the innovation by the teachers so that it is congruent to the intended or planned use.

Acceptability of the syllabus :- A clear understanding, perception and acceptance of the aims, objectives and innovations of the syllabus by the teachers.

1.7 ABBREVIATIONS USED

AAU	:-	Addis Ababa University.
ERGESE	:-	Evaluative Research of the General Education System in Ethiopia.
ICDR	:-	Institute of Curriculum Development and Research.
MOE	:-	Ministry of Education.
NETP	:-	The New Education and Training Policy.
SPC	:-	The School Pedagogical Centre.
SNNPR	:-	Southern Nation Nationalities and Peoples Region
TTC	:-	Teachers' Training College.

CHAPTER 2

REVIEW OF RELATED LITERATURE

2.1 Curriculum Implementation

The concept of curriculum implementation has been expressed in diffrent ways by diffrent scholars. However, all the attempts to define "implementation"lead to related meanings. For instance, a definition of a total implementation given by Ornstein (1988:224) indicates : "The acceptance, overtime, of some specific items-an idea or practice, by individuals, groups or other adopting units linked, to specific channel of communication, to a social structure, and to a given system of values, or culture." Beauchamp (1968:132) and Giroux (1981: 45-46) have also defined "Curriculum implementation" as simply putting the curriculum that was planned and developed in to practice. Furthermore, Giroux mentioned that the entire process of curriculum implementation is highly complex, so that it requires extremely skilful orchestration of participants and components for effective results. Fullan and Pomfrate (1977:336) defined implementation as : "the actual use of an innovation or what an innovation consists of in practice." Similarly, Fullan (1991:65) described implementation as a process that consists putting in to practice of an idea, programme, or set of activities and structures new to the people attempting or expected to change.

The above definitions in general indicate that implementation is a process of translating plans into actions. Implementation is the execution stage of a planned curriculum.Through these definitions,implementation is viewed criticaly since it is the means of accomplishing desired objectives set up.

During the first phase of curriculum development, intentions are planned, tried out, modified, retried until the developers are reasonably satisfied with the final product.

Idealy, there is no real end point to such kind of trial and modification. Neverthless, there is a stage at which the planners say " this programme is now ready for introduction in to schools on a large scale." This can be a demarcation between development and implementation stages of a curriculum. The decision of curriculum developers to introduce the developed curriculum in to schools on a large scale marks the begining of actual curriculum implementation.

Ornstein and Hunkins (1998:292) view curriculum implementation as an interaction process between those who have developed the programme and those who are charged to deliver it. The authors further elaborated that successful implementation of curriculum results from careful planning, which in turn focuses on three factors: people, programme, and organization. If an innovation or reform is to be fully implemented, at least the conditions of these three factors should be changed. Put diffrently, if implementation is to occur, change would likely occur in : curriculum materials, teaching practice, organizational structure, and belief or understanding about the curriculum and learning practice.

Implementation is a change in at least the four dimensions. Innovation that does not include changes on these dimensions is probably not significant change. For instance, the use of new text book or materials without any alteration in teaching strategies is a minor change. Real change involves changes in conceptions and role behavior. The possible use of new or revised materials such as curriculum materials, the possible use of new teaching approaches, and the possible alteration of beliefs on the part of teachers are the main components to be focused on in implementing any new curriculum or programme.

The use of new material refers to the content of the curriculum that the teacher is expected to transmit to the students, to the order in which this content is to be transmited, and specially to the various materials required as transmiting medium. The use of new teaching approach includes

a concern in new teaching styles, new tasks, new role relationship between teachers and students, teachers and principals and the likes. The alteration of beliefs deals with the knowledge and understanding that the teachers have about innovation's various components such as its philosophy, value,assumptions, objectives, subject matter, implementation strategies, and commitement to implement the curriculum.

For implementation to occur, the behaviour of all players in the cirriculum game must be addressed properly. Curriculum developers, administrators, principals, teachers and supervisors must be clear about the purpose, the nature, and the real and potential benefit of the innovation. There must be a continuous two-way communication between the planners and the implementers of the curriculum. Lewy(1977), Fullan (1981), and Fullan(1991) have also pointed out the complex nature of implementation, in that it deals with the difficulties related to planning and coordinating a multilevel social process involving thousands of people.

Regarding the problems and the complexity of implement-ation process, Pratt(1980:425)expressed his view by saying:

> "The voyage from the first identification of students' need to eventual learner achievement is often stormy, but more good curricula sink without trace on the shoals of implementation than at any other point."

Thus, as Fullan and Pomfrate (1977:336) have pointed out, curriculum implementation has to be viewed as a phenomenon in its own right, rather than as a simple extension of planning and adoption processes.

Likewise, Ornstein and Hunkins (1998:297) viewed implementation as essential part of curriculum development which brings the anticipated changes in to reality. This means in short, curriculum activity is a change activity. In addition to this, Fullan (1981:310-311)and Gene (1995:109-110) have also described implementation in the context of planned change.

Implementation is a means of achieving better learning outcome. It is the intervening variable which is essential to achieving the intended consequence of a curriculum.

There are several reasons why it is important to focus on implementation. The rational for initiation of curriculum implementation studies is described and explained by Fullan and Pomfrate (1977:336-339). They suggest the following four reasons why such studies become important:

❶ To know what has changed, it must be conceptualized and measured directly,

❷ To understand why so many proposed educational changes fail, it is necessary to study some of the most problematic aspects to bring about change,

❸ Not to do so may result in implementation being ignored or being confused with other aspects of change process such as adoption, and

❹ To interprt learning outcomes and to relate them to possible determinants, it is necessary to examine the implementation of the curriculum separately.

Snyder,J and his associates (1996:402-410) after reviewing the works of researchers on curriculum implementation for the past two decades, have classified studies of curriculum implementation into three approaches; fidelity perspective, mutual adaptation, and curriculum enactment. The three perspectives can be compared and contrasted as follows:

Approaches to curriculum studies	Assumptions of the Approaches
Fidelity perspective	• Already developed innovation exists • Implemented as intended by the developer • No possibility for curriculum modification by the implementers • measure the degree of implementation • The role of the teacher is to deliver the curriculum
Mutual adaptation	• Already developed innovation exists • coopration between the developers and users of the curriculum • Implemented with the adaption and decision made by the users • There exists possibility for modification of the curriculum by the implementers • Measure to what extent and how the innovation is adapted during the implementation • The role of the teacher is to adapt and deliver the ccurriculum
Curriculum enactment	• No developed innovation exists • Innovation is created jointly by students and teachers. • Study how curriculum is shaped by the teachers and students • The role of the teacher is to create the curriculum with students and develop the experience of students

Source : Adapted from Snyder,J (1996:402-410)

In general the stress of the authors cited is on the need for committed and knowledgeable teachers, programme arrangements, and organizational structures as essential constitutents of implementation. Therefore, the close coordination of people, programme, and organizational structures involved in the implementation process are typical features which indicate the essence of success in curriculum implementation.

But the credit for the conceptualizing and popularizing this approach goes to Ralph, W.Tyler(1949).

On the other hand, there are many educators who argue that the behavioural objective model for evaluating implementation is narrowly conceived, taking no account of the numerous other factors in the school. Specially, Tamir(1981:342) criticized strongly Tyler's approach to implementation evaluation for its serious weakness to look into the real process of implementation. As Tamir(1981) argued, the weakness of objective oriented evaluation is particularly with regard to the appraisal of transaction such as the interaction of material, students and teachers at classroom level. It concentrates only on the measurement of outcome and treats the classroom and the school as "black boxes". In other words, it is difficult to measure the outcome of implementation unless the activities in the "black box" (classroom) are uncovered by the evaluator. Educators like Proves (1971:10-12), Stake (1967:523-525), Parlett and Hamilton as cited in Stenhouse (1975:112-113), Mac Donald (1971:167), Scriven as Cited in Parson (1976:126) and Stufflbeam (1973:22-23) argue that the process in which curriculum is used and the environment in which it is used is as important as the evaluation of the educational outcomes. Though these educators have diffrences in emphasis, all of them criticize the objective evaluation model for its limited utility of results.

Of course, when outcomes are evaluated without knowledge of process, there is less probability for the results to provide a direction for action. It does not provide information about what produced the observed outcome, and therefore, the decision maker lacks basic information about the way the programme was implemented in the classroom. This is why some evaluators call it the "black box" approach to evaluation.

Thus, those educators who oppose the objective-based evaluation of implementation rely heavily on studies which aim to show more broadly the environment and the process

surrounding the curriculum at the time of implementation. These evaluators also stress that the evaluation of implementation of a curriculum must reach the classroom level and reveal what is really going on inside the classroom. Therefore, citing the view of Kell, as cited in Madaus and Thomas (1996:130-131) suffice to depict the intention of this group of evaluators. As to him: "...the process of education, particularly what happens in the classroom, is regarded not only as being more important than outcome but also as being the only thing that matters." As Kelly noted, one of the major criticisms of evaluation that focuses only on output is that the antecedent of achievment are hidden in the so called "black box", with the result that we do not even know if there has been adequate implementation of the planned curriculum.

In addition to this, Moris and Fitz-Gibbon (1978:9), Aldrich (1974:2-3), and Groteluschen (1982:99) have noted that curriculum implementation evaluation has to answer whether or not the unique combination of materials, activities, administrative arrangement, and role determined tasks seem to lead towards the achievement of the objectives. To answer these questions, a lot of information and data have to be collected from diffreent dimensions and angles involved in the process in order to have a comprehensive evaluation of implementation.

To this effect, a number of evaluation models were developed focusing on different aspects of a programme to be evaluated. One of the models used for determining programme standards, determining programme performance, comparing performance with standards, and determining whether a descripancy exists between performance and standards is the discripancy evaluation model proposed by Provus(1971). It involves the comparison of performance with standards. Scriven as cited in Popham (1993:28), Stenhouse (1975:103-104) developed judgmental or goal-free evaluation model. Scriven points out the importance of evaluating goals rather than simply seeing evaluation in terms of goal achievement, and he

also emphasizes that the curriculum must attempt something worthwhile as well as achieving what it attempts. Goal-free evaluation model focuses on the activities going on in the instructional setting as well as the outcomes of a programme, intended as well as unanticipated. Stufflbeam as cited in Popham (1993:31), Madaus and Thomas (1996:128) proposed CIPP evaluation model. It involves four aspects: context evaluation (involving needs assessement), Input evaluation(to identify and assess competing strategies), process evaluation, and product evaluation. Stake (1967:523-540) recomended the "countenance" evaluation with emphasis on three general variables: antecedents, transactions, and outcomes. The evaluation of antecedents focuses on the appraisal of the whole context as related to the implementation of a particular innovation interms of the students, the teachers, and the socio political situation. A special emphasis is given to the teachers' understanding, beliefs, and ability to comprehend and be in readiness for implementing the curriculum. Evaluation of transaction aims at finding out what is actually going on in the classroom. The outcome is the result of the antecedent and the interaction processes. Posner (1995:229) generalized the Stake's evaluation model by the figure below:

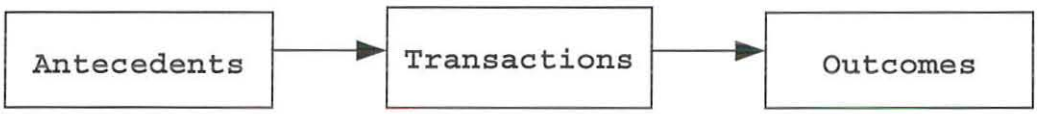

Figure 1: Variables in Countenance Evaluation Model

Therefore, as the above mentioned facts indicate, there exist two contrasting views of curriculum implementation evaluation. The former group who are objective-based educators, and the latter group of educators who can be grouped under the umbrella of the process-oriented evaluation approach. Though the latter group of educators are grouped under the same umbrella, They do have some minor diffrences in their area of emphasis. For instance, Stake's and Stufflbeam's view of evaluation extends to the extent of assessing both teaching-

learning environment and the students' learning outcomes. On the other hand, Scriven and others, gave more attention to the circumstances going on in the instructional setting. Hence, following context driven eclectic approach, seems appropate and advantegeous to fit a particular situation under investigation.

2.3 Factors Affecting Curriculum Implementation

Due to the complex nature of curriculum development there exist numerious factors that could inhibit or facilitate its realization. The source of most problems or factors affecting the realization or implementation is usually lack of emphasis given to implementation by policy makers. As O'Neill (1995:7) noted policy makers rarely develop a process for the implementation of their formulations. They expect the people on the receiving end of the policy to make it simply work in practice. It seems that usually policy makers tend to act on the assumption that change is an event, not a process. A study made by Herman and Stringfield as cited in Fullan (1999:19) indicate that indiffrence, negative climate, neglect of implementation training and support, such as program-specified staff development and failure to build-in system and time for coordination and problem-solving could kill implementation of any curriculum.

Implementation process is a change process and in this change process there are numerious interactive factors affecting implementation. Regarding this, what Fullan (1991:66-80) has indicated as major factors which influence implementation, after reviewing a number of studies that have examined curriculum implementation as a change process, can be catagorized into three major factors as: the nature of the change, change agents' role, and the organization to implement the change.

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2.3.1 Nature of the Change

Fullan (1991) stresses on two variables that should be considered seriously in relation to the characteristics of the innovation: Clarity, and complexity. Clarity (about goals and means) is a perennial problem in the change process. Even when there is agreement that some change is needed, as when teachers want to improve some area of the curriculum or improve the school as a whole, the adopted change may not be at all clear about what teachers should do. This means, lack of clarity; diffuse goals and unspecified means of implementation-represent a major problem at the implementation stage. Teachers and others find that the change is simply not very clear as to what it means in practice. Hence, the understanding of goals and means of innovation by users is crucial for the implementation, because the greater the understanding of the goals and what is to be gained from their adoption, the greater the degree of implementation. Complexity refers to the difficulty and extent of change required of the individuals responsible for implementation. The implementation of any change can be examined interms of difficulty, skill required, and extent of alteration in beliefs, teaching strategies, and use of materials.

Regarding clarity and complexity of a change, a number of studies have asserted that, teachers' lack of clarity about innovation as one of factors inhibiting curriculum implementation (Snyder and his associates,1996:406). Similarly, Soundress and Vulliany (1983:335) in their study of curriculum reform implementation in Tanzania and New Guinea, conclude that an inexplicit curriculum policy, embodying complex ideas and procedures, that make a radical departure from existing conventions will be vulnerable to resistance or modification by teachers in their day-to-day practice. Likewise, Fullan and Pomfrate(1977:368-371) have also asserted that the more complex the demand of the curriculum, the more likely that degree of

implementation will vary across groups of users. They put this propostion as follows:

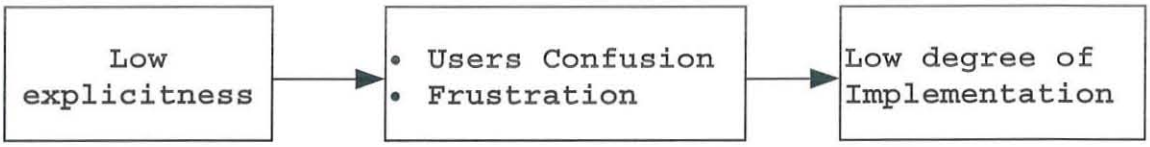

Figure.2: Linear Relationship of Complexity of a curriculum and its Implementation

Thus, complexity affects explicitness, and the more complex the curriculum is the more difficult it is to be explicit about the operational characteristics of the curriculum, therefore difficult to implement. In other words, a curriculum which does not specify the intents clearly and which poorly communicate it to the users, seems to be a barrier by itself for effective implementation.

2.3.2 Change Agents'Role

Schools are the final places where the innovation or the change of the curriculum is to be realized or implemented and the teachers and the principals are the major change agents in the implementation process. The roles of the principals and the teachers, the teacher-teacher relationship, and teacher characteristics orientations and behaviours manifested are some of the variables which can facilitate or inhibit the implementation of curriculum in the school.

2.3.2.1 The Principal

Because of the closeness to the classroom situation and opportunity to alter workplace conditions, probably the most powerful potential source of help or hindrance to the teacher in the implementation process is the school principal (Fullan,1991:143).

The principal has a leadership role for the implementation of the curriculum. Thus,the school administrative bodies including the principal should be involved in or consulted from the very begining at the design of curricular programme to be executed in the schools in order to play their roles actively. Ornstein and Hunkins (1998:228-243) considered the school principal as a key guarantor of successful implementation. However, as to them, successful principals are those who are knowledgable and committed to the curriculum. Furthermore, such principals also view their role as providing encouragement on one end of the continuum and serving as a curriculum leader on the other end.

Effective principals regularly and frequently check on the teachers to solicit needs and inquire how things are going on. This action is two-fold: teachers feel valued and cared for,and a clear signal is given so that the change is of high priority and deserves attention. Effective principals visit classrooms often to lend their support, and to provide pressure as they are discovering what is happening in classrooms.

Facilitating change, helping teachers work together assessing and furnishing school improvement are some of the roles of the principals. However, how principals actually spend their time is obviously a better indicator of their impact on the school. Cuban in his study, as cited in Fullan(1991:151), concludes that, while styles differ, the managerial role, not instructional leadership, has dominated principals behavior. Usually principals have little time for change.

If implementation is to occur effectively at school level, the role of the principals must be changed from managerial to instructional aspects. Principals must change their role to change agents. Regarding this, Hall and his colleagues, as cited in Fullan(1991:153), noted that the degree of implementation of the innovation is diffrent in diffrent schools because of the actions and concerns of the principals.

The principal has to become directly involved in the change process in the school. He has to work with the departments in helping them plan what they are going to do with the guide line. He has to meet with them, has to sit down with them, has got to be familiar enough with the documents that he can discuss. The principal has to be prepared to give some of his time to that particular group of teachers,say mathematics department, and be involved not in all of their meetings. But some of them, keeping informed, being knowledgable about what they are doing.

Initiator principals work more with staff to clarify and support the use of the innovation(consultation and reinforcement). In other words, the functions to be performed by effective principals are: developing supportive organizational arrange- ments, consulting, reinforcing, monitoring, etc...

However, as Hall, in Fullan(1991:155-156), noted it, principals do not lead change effort single-handedly. There are other change facilitators such as vice-principals, unit leaders and head teachers, in school who in most cases,are making a large number of interventions in the change process. The important thing is not merely having other change facilitators active at the school site; but it is how well the principal and these other change facilitators work together as a change facilitating team. It is this team of facilitators, under the lead of the principal that makes successful change happen in schools.

Hence, as principals have a major impact on the degree of implementation, we and they have to assume their role in terms of the facts and theories suggested by the educators cited above. The larger role of a principal has to be transforming the culture of the school. That is, a culture of "new way of doing things" and "collaborative working" environment for the students' effective learning.

2.3.2.2 The Teacher

As Fullan (1991:127) described it " If the change works, the individual teacher gets little of the credit; if it doesn't the teacher gets most of the blame." From this statement, we understand how decisive and sensitive the role of the teacher is in the implementation process. Put diffrently, educational change depends on what teachers do and think.

At the teachers level the degree of change is strongly related the extent to which teachers interact with each other and others providing technical help. Within the school, a collegiality among teachers, mutual support, help, etc. are strong indicators of implementation success. Significant educational change consists of changes in beliefs, teaching style, and materials. Of course, it needs basically, the understanging of the change itself.

It is the change that happens in the individual classroom that changes the school, and so do schools, districts, and state. As Gene Hall and David Carter(1995:173) have described it, one of the failure of understanding about implementation few years ago was that we did not accept the fact that a school does not change until each individual teacher within the school successfully implements the innovation. The only way that classroom effects can accumulate to be school effect is if there is the use of the innovation in each classroom. To look at the school as a whole, first we need to look at the use of the innovation by each teacher. Each teacher individually can have an effect. The accumulation of the activities of teachers and their effects aggregate and compound to become school effects. Then of course, as we look at a district or a state, the multiple school and districts effects can accumulate. Put diffrently, the key building block for all this is what happens in each classroom. And the teacher as a change agent determine what happened in the classroom. Unless classroom and school activities change, the most sensitive tests possible will measure no postive changes in outcomes.

The study of Newman and his colleagues as cited in Fullan (1998:2) indicate that more successful schools had teachers and administrators that formed a professional learning community (collaborative work culture) focused on student work (assessment), and changed their instructional practice (pedagogy) accordingly to get better results.

Collaborative activity can enhance teachers' technical competence. As teachers work with students from diffrent backgrounds, and as the curriculum demands more intellectual vigor, teachers require information, technical expertise, and social-emotional support far beyond the resource they can get as individuals working alone. When teachers collaborate productively, they observe and react to one another's teaching, curriculum and assessement practice, and they engaged in joint planning.

Clearly shared purpose and collaboration contribute to collective responsibility. One's colleagues share responsibility for the quality of all students' achievement. This norm helps to sustain each teacher's commitment. In short, professional community within the teaching staff sharpens the educational focus and enhances the technical and social support that teachers need to be successful.

The greater the sense of teacher efficacy, the greater the degree of implementation. Educational change depends on what teachers do and think. Lack of teachers' knowledge and skill to conform to the new mode is one of the inhibiting factors, and lack of staff motivation is another. McLaughlin(1976) refers to the attitude of teachers as critical factor for implementation. Sounders and Vulliamy (1983:361) capitalized on the teachers as the most important link in any chain of educational innovation. To them, it is what goes on in the classroom that finally affects student learning-which is the end result of implementation. Thus, unless teachers are helped to develop new lesson, content and new teaching skills, they will revert to pre-innovation practice. This suggests the necesseity of "in-service" training and resource support for

teaching during implemmentation to enhance effective practice. Baker(1977:556) described that lack of teacher enthusiasm can wipe out programme effectiveness. It is unlikely to implement an innovation which does not receive a warm acceptance on the part of teachers. It seems because of this that Ornstein and Hunkins (1998:293-294)advised school leaders to consider teachers'need, level of commitement, and skill when determining when and how to involve teachers in curriculum implementation. This is because teachers want programmes which reflect their philosophy and curriculum orientation. This is due to the fact that teachers'action to a large extent are based on their attitudes.

In addition to this, the ability of teachers to implement the curriculum has to be given equal importance like other factors, because, the extent to which a curriculum is implemented as planned depends upon the extent to which teachers are clear about, and the degree to which they are competent to perform it. Teachers can not teach what they do not know. Sayler, Alexander, and Lewis (1981:260) have also affirmed that a teacher's instructional plan and a curriculum plan may not connect if a teacher neither understands nor accepts the basic assumptions of the curriculum. Therefore, as Snyder and his associates(1996:429) noted being the deliverer of the curriculum to students, the role of the teacher is recognized as being critical to the success of the curriculum implementation. In other words, the aim and objectives of the curriculum cannot be achieved unless the teacher implements it in the way in which it was intended to be implemented.

2.3.3 The Organization to Implement the Change

Implementation of a curriculum demands on the organization or setting in which people work. The aspects of organization are numerious. However, those aspects related to the school organizations are crucial for the implementation of innovation. The quality and quantity of staff development, the channel of

communication that allow continuous flow of information between the curriculum developers and implementers, the availability and adequacy of instructional materials are some of the variables to be considered in relation to the organization of individual school. In addition to this the relationship of the school with parents and the openess of the school for outside relationship are important organizational aspects for effective implementation of a curriculum.

A real administrative support increases the degree of implementation at school level. That is the adminstrative support has postive effect on the implementition whereas the incompatability of the organizational arrangement are inhibiting factors for implementation. Moreover, the greater the quality and quantity of sustained interaction and staff development, the greater the degree of implementation. Concerning this, Mc Neil (1990:227-228) described it that, a key to educational change must include staff development. To him, staff development is now a central focus in successful curriculum implementation. Intensive staff development, rather than single one-day workshop is an important strategy. In addition to this, Mc Neil also suggested that active involovement of the teachers in the developmental process (in developing guides and materials) is more important in persuading teachers to implement plans than their participation on the curriculum committees that decide on the plan.

On the other hand, whenever a new plan or programme is being designed, a communication channel must be kept open so that the programme does not come as a surprise to the implementors. Frequent discussion about a new programme among teachers, principals, and curriculum workers is a key to successful implementation. There must be a comperhensive net work of communication that can provide reliable information at all levels of the system.

Educational organization and management needs to sort out the tasks at each level beginning from the centr to school level and formulating structure, tasks and responsibilities of

but they also help students learn how to learn. Amare(1999:64) has also argued that the problem-solved or student centred approach which is strongly stipulated in the NETP can not be realized with out making optimal use of instructional materials.

In connection with this, Verspoor(1989:1) generalized that the unfavorable economic environment and the resulting scarcity of resources jeoparadizes the ability of developing countries to provide quality education. Surveys conducted in diffrent developing countries show that teachers do not have the necessary instructional materials at their disposal. Most of the students in Primary Schools of developing countries have to sit on the floor. There are classrooms without a blackboard, and most classrooms do not have sufficient sitting places for the students (Caillods and Postlethwaite,1989:172-173; Ross and Postlethwaite, 1992:28).

Likewise, a replication of the Second International Mathematics Study (SIMS) which was conducted at grade 8 level in Dominican Republic during the 1982-83 school years revealed that the textbook was the main resource of teachers to teach mathematics; but only 25 percent of 8th graders owned a mathematics textbook(Luna et al,1995:67). In addition to this, the classroom observation and interview of the study revealed that schools were ill-equiped,classrooms were poorly lit and inadequate chalkboard areas, few students had textbooks and teachers spent most of the mathematics class copying the lessons and exercises on to the chalck board for the students to copy in their notebooks. This meant that students spent most of the mathematics class time copying from the chalkboard rather than doing mathematics.

A look at the Ethiopian case(ERGESE,1986:45) makes it clear that to teach the primary school subjects as intended in the curriculum, there is a serious shortage of instructional materials. Besides this, most of the primary schools classrooms were poorly constructed and ill-equiped. Moreover Bizunesh(1983:56-57) in an evaluative study of Kindergarten

Curriculum implementation in Addis Ababa, Mekasha(1991:69-72) in the study of the implementation of the primary school Home Economics Syllabus in Keffa and Illubabor Administrative region, and Anbesu et al (1998:55-58) in the study of classroom Interaction in some Ethiopian Primary Schools have reported that the full and effective implementation of the curricula studied were hampered by shortage and lack of instructional facilities.

Thus, as the research results cited above revealed, the implementation of a curriculum can be inhibited by the lack and shortage of the necessary instructional facilities in the school.

In general, as the process of curriculum implementation is complex and requires contact with many schools, teachers, students, and other educational workers, a number of factors could influence the success of its implementation. The nature of the change or curriculum itself (clarity and complexity), the role of the change agents (principals and teachers), and the organization for implementing the change or the curriculum appear to be the main potential factors identified in the literatures which inhibit or facilitate the success of curriculum implementation.

2.4 Teaching-Learning Mathematics

As Nacaro-Brown and his associates(1982:2) have described it, teaching embaraces many kinds of processes, behaviour, and activities that no single theory can explain adequately. They defined "teaching" as an attempt to help some one acquire, or change, some skill, attitude, knowledge, ideas or appreciation. This kind of approach to the meaning of "teaching" implies that the teacher's task is to create or influence desirable changes in behaviour, or in tendencies towards behaviour, in his students. Hence, the only valid criterion of success in teaching is the degree to which the teacher has been able to achieve this learning in his students. Concerning this, Douglas

teaching methods. To him a sound mathematics education at the primary school level which provides the basic elements of the later mathematical ideas will enable children to persue secondary school mathematics successfully. Students at this level should not be treated as pieces of registering apparatus which store up information isolated from action and purpose. The focus of mathematics teaching should not be in teaching children mathematics, but in teaching children to learn mathematics. Regarding this, Blenkin and Kelly (1994:117-118) described it that, mathematics should focus on practical and problem solving issues. It must be used in the day-to-day life of the learners for the societal need and activities at large. It should be vissible and meaningful. This of course, requires the changing of the traditional role of mathematics teachers. The role of mathematics teachers in the traditional classrooms is managerial or procedural in that their job is to assign a lesson to their students, to start and stop the lesson according to some schedule, explain the rules and procedures of each lesson, judge the action of the students during the lesson,and maintain order and control througout(Carpenter and Romberg,1986:851). Therefore, the attitude of teachers towards mathematics should shift from the traditional i.e, looking mathematics as difficult and very structured body of knowledge, to the modern.

After reviewing the Nigerian primary school mathematics education, Adedoton(1990:9-12) suggested the discovery method,using questions, and using the grouping method for effective teaching-learning of mathematics at primary level. In the "discovery" method, students are guided to discover principles, rules or results by carrying out relevant investigations or by studying mathematical patterns. Children who use the discovery method to learn will not only have a better mastery of the content, but also become more inventive and less dependent on authority. In the "use of questions", students will become more active and involved in a lesson. Students' answering of questions also enable the teacher to

judge their level of understanding and to assess their progress. The use of questions will also assist teachers in using the discovery method effectively. Some mathematical lessons lend themselves to group work. The teacher should choose a "method of grouping" which is best suited to the need of the class, such as forming groups of the same ability, or mixed ability group. Group work can also be organized when teaching materials are in short supply.

Rosenshine and Stevens(1986:376-387) reviewed numerous studies which are very much related to teaching-learning mathematics. There have been successful experimental studies of mathematics instruction in which teachers were trained to increase the academic achievement of their students. These studies revealed that the higher the teachers are trained, the higher the achievement and/or the acadamic engaged time of students. The results of these studies indicate that there are specific instructional procedures in which teachers can be trained to follow and which can lead to increased achievement and student engagement in their classrooms. The authors further generalized that the major components in systematic teaching of mathematics include: teaching in small steps with students practice after each step, guiding students during initial practice, providing all students with a high level of successful practice.

Another major part of instruction in mathematics is "demonstration". All teachers, of course, demonstrate new skills and materials, but researches in grade four to eight have shown that effective mathematics teachers spend more time in demonstration than do less effective teachers(Everston et al, Good and Grows, Stalling et al, cited in Wettrock, 1986:381). The findings of these studies revealed that the most effective mathematics teachers spent about 23 minutes per day in lecture, demonstration, and discussion, whereas the least effective teachers spend only 11 minutes. In addition to this, effective mathematics teachers in primary schools devote more time in guided practice. That is they spent more time

asking questions, correcting errors, repeating the new material, and solving problems with teacher guidance. Although all mathematics teachers ask some questions, studies have shown that effective mathematics teachers asked many while the less effective ones asked few questions (Wettrock,1986:383).

Everston and his associates as cited in Rosenshine and Steven(1986:383) have obtained similar results on the importance of a high frequency of questions in mathematics of grades six to eight. Moreover, these studies have revealed that in junior high school mathematics instruction, the most effective teachers asked an average of 24 questions during the 50 minutes mathematics period, whereas the least effective teachers asked an average of only 8.6 questions.

"Checking for udnerstanding" is also necessary in teaching mathematics. This refers to frequent assesment of whether all students understand either the content or skill being taught, or steps in a process. Checking for understanding should take place frequently so that the teacher can provide corrections and reteach when necessary. The wrong way to check for understanding is to ask only a few questions, call on voluntrees to hear their (usually correct) answers, and assume that all of the class either understands or has now learned from hearing the volunteers response (Wettrock,1986). Another error is to ask," Are there any questions?" and if there aren't any, assume that every body understands everything.

Therefore, as the studies cited above indicate the teachers' attitude towards the subject, their training and ability to use diffrent methods and techniques in the classroom are decisive to realize the implementation of mathematics syllabus in the classroom.

CHAPTER 3

METHODS AND PROCEDURES OF THE STUDY

As mentioned earlier, the aim of this study is to evaluate the implementation of grade 8 mathematics syllabus and to indicate the problems faced in implementing it. The approach followed in this research is the descriptive survey method. This method is more appropriate to gather several kinds of data related to the problem under study.

3.1 Model used in the Study

Stake's "Congruence-Contingency Evaluation Model" was adopted for the study due to its suitability to the nature of the study. Stake's model gives due consideration to both the objectives and the instructional aspect, which are the theme of this study.

The model is helpful in mapping out, and illustrating the eclectic nature of evaluation. It encompasses both the process and objective approach. The model can be used in both formative and summative evaluation. It is the most comprehensive frame work for evaluation (Mc Cromic and James, 1989:179; Yeoman and Beck, 1987:30-31). The model brings into focus both the intended features of a curriculum and the correspondingly observed or actually performed features. It involves the gathering of data from diffrent sources to fill the three broad categories of events that have to be evaluated, namely, "antecedents", "transactions", and "outcomes" as shown in figure 8.

as reflected in the students' competence to perform a task is tested as an outcome variable.

Since the general methodology of the study is descriptive survey, only one aspect of Stake's data processing is adapted i.e finding only the congruence between intents and observations. Intents, in this case, include what is suggested in the mathematics syllabus and the teacher's guide of grade eight. The observations are the actual field data obtained from the implementers of the syllabus in response to the variables set in the study.

3.2 Subjects and Sampling Procedures

The universe of the study includes all primary schools from grade 5-8 in SNNP region. However, since it was difficult to consider all zones in the region because of time, budget, and manpower, the target population was selected from Sidama Zone only.

In order to choose a representative sample of the target population a multi-stage cluster sampling technique was employed.

According to the statistical information obtained from the Regional Education Bureau and Sidama Zone Education Department a total of 45 primary schools with grade 8 inclusive were actually functioning in 1998/99 acadamic year. Within these schools a total of 11026 students were enrolled in grade 8. Therefore, as this number is too large, the use of multi-stage cluster sampling technique is necessary (Koul,1988:116).

There are nine weredas in Sidama Zone (namely:Aleta Wondo, Arbegona, Aroresa, Awassa, Dale, Hulla, Shebedino, Bensa, and Dara) and out of these nine weredas, four weredas were sampled at random (Aletawendo, Awassa, Dale, and Shebedino). Out of these four weredas, a total of four schools (one from each wereda) were selected randomly as a source of information.

There are numerous suggestions about the necessary size of sample. One is that the a sample size should be a regular proportion (often put at 5 percent) of the population. Another

because, though English is an official medium of instruction in the region at grade 8, the practical medium has been Amharic. It also avoids problem of language in understanding the questions and gives chance to the respondents to use practical medium. The translation of the questionnaires from English into Amharic was done by second year postgraduate students of Amharic Department in AAU.

The questionnaire for mathematics teachers has got three major parts. The first part was prepared in the form of an attitude scale to get information about the teachers' agreement or disagreement with the design and specifications of the syllabus. The items for this section were developed by taking the syllabus, the teachers' guide, and the textbook as reference to get useful statements for measuring the attitude of teachers towards the syllabus. The second part of the questionnaire was prepared to collect information about the existence or absence of a conducive teaching-learning environment, and the organizational structure for the implementation of the syllabus. The items in the third section were prepared to get information about the major factors which influence the implementation of the syllabus. In this section, a set of possible factors were randomly listed and respondent teachers were asked to rank these possible factors according to their priority of influence.

The draft questionnaire for teachers was first administered to four mathematics teachers of grade 8 in two primary schools selected for the pilot study (Morocho and Haik) in Awassa and Shebedino weredas. After it has been filled in by the teachers, it was analysed item by item to detect ambiguous and unclear statements. Particularly, in the attitude measurement statements the discrimination power(D) for each item of attitude question was calculated. Burrrough (1971:120) noted that the value of D should preferably be not less than 1 and certainly not less than 0.5 if the statement is to be retained as a good one. In this case those statements with discrimination power of less than 0.5 were all discarded and

only 14 statements among the 33 with D greater than or equal to 0.5 were retained. The consistancy coefficent(R_c) for the attitude statements was also calculated using the split-half reliability method to check the internal consistency of the statements. By correlating the sum of odd statements for each individual against the sum of even statements a coefficient of 0.93 was obtained. The correlation coefficient obtained in the pilot study (0.93) appears to be a good indicator of the internal consistency of the items. The rest of the questions were proved to be useful for the purpose intended except for some minor modifications.

The draft of the questionnaire for the directors was also first administered to two directors of the two primary schools selected for the pilot study. After it has been filled in by the directors, each questionnaire was examined item by item and some unclear and ambigous statements were discarded and some other relevant questions were included. Finally, both questionnaires for the teachers and for the directors have been administered directly by the investigator.

3.3.2 Achievement Test

Based on the syllabus, the teacher's guide, and the students' textbook, an achievement test was prepared. The test was prepared in collaboration with instructors in Awassa Teachers' Training College, and the authors of the textbook who are experts in the subject (see Appendix E). In developing the test items, first a table of specification was prepared considering the portions to be covered during the first semester(see Appendix D). As a result, seven of the instructional objectives of grade eight mathematics were found to be covered during the first semester. Based on the table of the specification, thirty multiple-choice test items were prepared. Since the nature of a test instrument has to depend on the instructional objectives to be evaluated, an attempt was made to analyse the instructional objectives in terms of the

With the help of observation rating form and checklist (prepared by the investigator), the actual classroom teaching-learning processes were observed. The classroom rating form and the checklist were developed by thoroughly examining the mathematics syllabus of grade 8 and the teachers' guide, and identifying the guidelines and instructional activities which are critical to the implementation of the syllabus (see Appendix F). Both the rating form and the checklist were pretested in four classroom sessions of the schools selected for the pilot study by the investigator and the assistant observer. The assistant observer, who is an expert in mathematics and an author of the teacher's guide and the textbook, was given some kind of training in how to make observation. To this end, 83.33 percent inter-rater reliability for the rating form and 92.30 percent for the checklist were obtained. This shows that there was a high degree of agreement between the observers. Those items which were too general and ambigious were refined for the final use. Then each sample teacher was observed twice in his/her classroom making the total observation sessions fourty in number.

3.4 Methods of Data Analysis

Depending on the nature of the research questions and the data collected, diffrent statistical techniques were employed. For the first research question, as it is associated with attitude measurement, each response is associated with Likert's five point scale (Strongly agree = 5, Agree = 4, undecided=3, Disagree = 2, and Strongly disagree = 1). After the attitude score for each respondent was calculated by summing the point values given for each statement, the scores were categorized in to high and low using a median test. In calculating the median test, first the teacher respondents were grouped into two on the basis of their school type (Urban and Rural). The attitude score of each teacher was listed under the School type he/she belongs. Then, the scores of the two groups were combined in

to a single distribution and a grand median was computed (see Appendix G). After that the scores in each group was compared with the grand median. If the score is above the grand median, it is assigned to the "above median" category. If it is not above the grand median, it is assigned to the "below median" category. In so doing, the data were arranged in to a two-by-two table followed by the calculation of the chi-square(x^2) satistics test to show whether there is a significant difference or not between the above median and below median proportions in the two groups, with alpha(α) 0.05 level of significance. To this end, scores falling above the median would indicate a positive attitude towards the implementation of the syllabus and vice versa.

Regarding the second research question, data obtained through classroom observations were organized on the basis of the items of the rating form and the checklist. The rating form was prepared with a three point scale (frequently, rarely, not at all) to indicate the frequency of occurence of instructional considerations. The values given for each teacher during the two observation sessions were tallied into one of the three scales. Finally, the frequency counts were changed into percent to make the figure easily understandable. Similarty, the checklist was prepared with a two point scale (yes,no) to indicate the existence of absence of some selected implementation variables. The values given for each teacher during observation were tallied into one of the two scales and expressed in terms of percentage. To summarize the data obtained for the third research question, simple frequency counts and percentages were used. With regard to the fourth research question, that is the students' achievemtnt test, the test results were scored in terms of sub-tests or group of items. In this case, the test results were scored into seven subgroups as the objectives to be measured are seven. This has been done to evaluate how well students performed on sub-tests or group of items measuring the same objective. The minimum

CHAPTER 4

ANALYSIS AND INTERPRETATION OF DATA

In this chapter the data collected through the questionnaires, classroom observation, and achievement test are presented with the help of tables. They are then followed by interpretation and discussion to give answers to the five basic questions set in the study.

4.1 Teachers' Attitudes Towards the Specifications of the Syllabus

The attitude of an individual emerges from his knowledge and understanding of a particular thing or issue. In the same vein, Grade 8 mathematics teachers have attitudes towards the syllabus of the subject since it is assumed that they have the necessary knowledge and understanding of the syllabus to teach the subject effectively.

Table 2

Teachers' Attitude by School Type

	Teacher Respondents		
Category	Urban	Ruran	Total
Above Median	2 (18%)	6 (67%)	8 (40%)
Below Median	9 (82%)	3 (33%)	12(60%)
Total	11	9	20
$X^2 = 3.038$			

The median for the twenty respondents, i.e, the grand median is forty-one(see Appendix G). Then, as shown in Table 2, teachers who got a score above the grand median and those who scored below are differenciated in terms of the school types they taught, forming a two-by-two contingency table. Based on the data depicted in the table, a chi-square (x^2) median test statistics was computed(see Appendix G for the

calculations). The result shows that the computed chi-square value ($x^2 = 3.038$) is less than the critical chi-square value ($x^2 = 3.84, df = 1, p \leq 0.05$). Hence, there is no statistically significant diffrence in the level of agreement to the implementation demands of mathematics syllabus among urban and rural teachers at $p \leq 0.05$ level of significance.

However, a look at the distribution of the data in Table 2 revealed that out of the respondents in rural schools most of them (67 percent) fall above the median, while only 18 percent of the urban respondents fall above the median. Put diffrently, 67 percent of rural, and 18 percent of urban teachers exhibited high level of agreement (postive attitude) to the implementation demands of the syllabus. In general the data in Table 2 revealed that 60 percent of mathematics teachers of grade 8 tend to exhibit negative attitude towards the specifications of the syllabus.

Though 60 percent of the teachers exhibited negative attitude towards the syllabus, all of them (100 percent) reported that they are assigned to teach mathematics on the basis of their choice. This implies that their negative attitude towards the syllabus is not because of their lack of interest in teaching mathematics at grade 8 but because of their qualification. A considerable number of the teachers(45 percent) are not qualified in mathematics for the level recommended by the policy. They are below the recommendation of the policy to the level. Therefore, this low level of agreement towards the implementation demands of the syllabus on the part of the teachers, seem to be due to the relative complexity of the contents of the syllabus as reported by the majority of the teachers as well as the existence of a considerable number of under qualified teachers for the level. Moreover, the mismatch between the implementation demands of the syllabus and the actual teaching learning environment of the schools might have contributed to develop this kind of attitude on the part of the majority of teachers. At the same

time there is variation among urban and rural teachers' attitude. Rural teachers show a relatively more postive attitude than urban teachers. Furthermore, most teachers believe that the content of the textbook is beyond the capacity of students. But it also seems that the content of the textbook appear some how difficult for the teachers themselves because they are not well trained to transmit the content effectively.

The result of this study, therefore, accord with what Ornstein and Hunkins (1998:293-294) remarked that teachers want programmes which reflect their philosophy and curriculum orientation. This is due to the fact that teachers' actions in large part are based on their attitude. McLaughline (1976) refers to the attitude of teachers as critical factor for implementation.Therefore, this result answer the first research question of the study. That is, the absence of postive attitude towards the specifications of the syllabus on the part of the majority of teachers has been revealed. Thus,this low level of agreement on the intents of the syllabus exhibited by teachers could undoubtedly influence the effectiveness of the implementation process. This is due to the fact that the relationship between thought and action is very crucial.

The teacher takes the individual diffrence into consideration and assists his students	5	12.5	13	32.5	22	55.0	40

TABLE 4

CLASSROOM OBSERVATION RESULTS (CHECK 1IST)

Implementation Variables	Check				Total class Sessions Observed
	Yes		No		
	No	%	No	%	
Begin a lesson with statements of goals	11	27.5	29	72.5	40
The teacher checks home work	11	27.5	29	72.5	40
The teacher summarize previous day's lesson.	23	57.5	17	42.5	40
The teacher uses the text book in the classroom as a resource material	31	77.5	9	22.5	40
Using instructional materials in the classroom	12	30.0	28	70.0	40
The teacher conducts class work	28	70.0	12	30.0	40
The teacher is available to provide immediate help to students during class work	15	37.5	25	60.5	40
Lets students to do some exercises and to solve problems on the black board	13	32.5	27	67.5	40
Divides the class into groups and encourages students to work in group	-	-	40	100	40
Gives home work and assignement	20	50.0	20	50.0	40
Ends lesson with review or summary	8	20.0	32	80.0	40
Misunderstanding of some content elements by the teacher	17	42.5	23	57.5	40

The observational data presented in Tables 3 and 4 reveal the actual classroom instructional performances of the teachers. In general a glance at the result summarized in

Table 3, depicts that there are certain instructional considerations which have been less implemented than the others. Though guided practice, demonstration and discovery methods are the major instructional strategies suggested in the syllabus and Teacher's Guide they were overlooked by the teachers in the majority of the class sessions observed. With this regard, the findings of the studies reviewed by Wettrock(1986:381) revealed that effective mathematics teachers in primary schools devote more time in guided practice. That is, by asking questions, correcting errors, repeating the new material, and solving problems with teacher guidance. In the same vein, mathematics teachers of grade 8 in our schools are expected to guide their students to discover principles, rules or results by carrying out relevant investigations or studying mathematical patterns. However, these instructional guidelines of the syllabus were not implemented in most of the classroom sessions observed as frequuently as they should be. It seems that teachers are teaching based on their own previous experience only, and not according to the guidelines of the syllabus.

The result of this study, therefore, is in agreement with research finding of Carpenter and Romberg(1986:851). These researchers revealed that mathematics teachers are essentially teaching the same way they were taught in schools.

The predominant pattern of teaching observed is extensive teacher directed explanation. At the same time as it is shown in Table 3, the teachers were observed while writing notes on the chalk-board frequently in 80 percent of the classroom sessions. This might be because of the inavailability of the textbook in the hands of students. As it has been indicated in Table 11, nearly all of the teachers (80 percent) are using the textbook as a major resource material in their instructional processes, whereas almost all of the students have no text books in their hand.

This result substantiates the study which was done in Dominican Republic at grade 8 level (Luna et al, 1995:67). The

result of the study revealed that the textbook was the main resource of teachers to teach mathematics, but only 25 percent of 8th graders owned a mathematics textbook. The study further mentioned that teachers spent most of the mathematics classes copying the lessons and exercises on the chalk-board for the students to copy in their notebooks. This implies that students spent most of the mathematics class time copying from the chalk-board rather than doing mathematics.

One of the crucial instructional requirements of grade 8 mathematics syllabus is to relate basic concepts of the subject with the day-to-day(contemporary) affairs so that the students can visualize the application of the subject. The result of this study clearly shows that in 67.5 percent of the classroom sessions observed (see Table 3) no attempt on the part of the teachers was made to relate mathematics with day-to-day(contemporary)affairs. The lessons were presented conceptually without any example related to the learners' experience and immediate environment. This may be due to lack of skills on the part of the teachers, the nature of the contents of the textbook, and the insufficient explanation of the contents of the textbook in the Teacher's Guide(See Table 11). This result contrasts with the statements of Blenkin and Kelly(1994:117-118) who discribe that mathematics must apply to the day-to-day life of the learners and must be used for social need and activities at large.

One of the proper and effective ways of beginning a lesson is by summarizing the previous day's lesson to the students. This has the advantage of winning the attention of students by beginning the lesson from what they have already learned. To this end, the majority of the teachers have performed the task. That is in 57.5 percent of the sessions observed, the teachers began their lessons by summarizing the pervious day's lesson. Dividing the class into groups and encouraging students to do and solve some exercises and problems in groups is one of the instructional strategies suggested by the syllabus. Besides, grouping is an appropriate instructional strategy whenever

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there is shortage of curriculum materials such as textbook. With this regard none of the teachers have used grouping method in their instructional procedures.

Teaching through classwork and homework is another instructional strategy suggested in the syllabus and Teacher's Guide. However, though in the majority (70 percent and 50 percent) of class sessions teachers were observed to give class work and homework respectively (see Table 4), teachers in most class sessions(60.5 percent) fail to help their students while doing their classwork and to give corrections. At the same time in 72.5 percent of the class sessions teachers do not check homework.Thus, these important instructional requirements are not well implemented. This may be due to the absence of textbook and shortage of time to cover the textbook.Regarding textbooks, the response of the school directors through the questionnaire substantiates the existence of a critical problem. The directors of all schools reported that even the very few books given to them do not arrive on time because of lack of responsible persons and shortage of budget.

As it is indicated in Table 10, the period alloted to cover the portion is not adequate for 80 percent of the teachers. As a result, the majority of the teachers came into class with too much content to transmit within a single period. Consequently they will be in short of time to check and correct classwork and homework of their students. Furthermore, the majority of the teachers do not have time to summarize their lesson.

The pedagogical aspects of the subject alone are not adequate for the teachers to implement the syllabus effectively. Teachers must be capable of transmitting the contents of the subject to their students with confidence. Teaching students in a wrong way or in a distorted meaning of the content affects not only the immidiate understanding of the learners, but also destroys the students' future interest and utilization of the subject. With this regard, there exists a critical problem on the part of the teachers. Misunderstanding

of some content elements by the teachers was observed in 42.5 percent of the class sessions. The presentation of most teachers lack depth, sequence, and clarity. This result which revealed the low capability of teachers in transmitting the content of the subject is also substantiated by self report of the teachers themselves. That is, as can be seen in Table 11, 90 percent of the teachers have reported that they need some more training to be given to implement the syllabus effectively. Further more, the directors of all schools have also reported the necessity of some more training to teachers of mathematics in relation to the NETP. However, in 57.5 percent of the class sessions teachers were observed while transmitting the content of the subject clearly and correctly for their students.

Therefore, these results answer the second research question of the study. That is whether mathematics teachers of grade eight use effectively in the classroom or not the instructional guide-lines set in the syllabus.

4.3 Instructional Resources in the Schools

The results presented in the following eight consecutive tables(Tables 5 to 12) show the state of existence of instructional resources in the schools relevant to the implementation of mathematics syllabus of grade 8 and the role relationship of change agents in the schools. Instructional resources include those required basic classroom furniture, teaching materials, instructional materials (teaching aids), time needed for various purposes, support provided by the directors, and the school requirments needed for teaching such as exercise books, papers, pencils and the like. The role relationship of the change agents refers to the duties and responsibiilities of the teachers and the directors, the teacher-teacher relationship,and the teacher-director relationship.

TABLE 5

The Condtion of the Teaching-Learning Classrooms by School Type

Classroom furniture	Teacher Respondents																	
	Urban N = 11						Rural N = 9						Total N = 20					
	Adequate		Inadequate		none existent		Adequate		Inadequate		none existance		Adequate		Inadequate		none existance	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Students' desks	-	-	11	100	-	-	3	33.3	6	66.7	-	-	3	15.0	17	85.0	-	-
Benches (chairs) for students	-	-	11	100	-	-	3	33.3	6	66.7	-	-	3	15.0	17	85.0	-	-
Table and chair for the teacher	-	-	-	-	11	100	-	-	3	33.3	6	66.7	-	-	3	15.0	17	85.0
Chalk-board	5	45.5	6	54.5	-	-	3	33.3	6	66.7	-	-	8	40.0	12	60.0	-	-
Notice board	1	9.1	1	9.1	9	81.8	-	-	5	55.6	4	44.4	1	5.0	6	30.0	13	65.0
Duster	1	9.1	1	9.1	9	81.8	1	11.1	3	33.3	5	55.6	2	10.0	4	20.0	14	70.0
Instructional materials for mathematics	-	-	5	45.5	6	54.5	-	-	9	100	-	-	-	-	14	70.0	6	30.0

TABLE 6
School Requirements Provided by the Schools for the Teachers by School Type

Requirements for teaching	Teacher Respondents																	
	Urban N = 11						Rural N = 9						Total N = 20					
	Adequate		Inadequate		not at all		Adequate		Inadequate		not at all		Adequate		Inadequate		not at all	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Exercise books for preparing lesson plans	6	54.5	5	45.5	-	-	2	22.2	7	77.8	-	-	8	40.0	12	60.0	-	-
Ball points/pencils	-	-	7	63.6	4	36.4	-	-	6	66.7	3	33.3	-	-	13	65.0	7	35.0
Paper for tests	1	9.1	3	33.3	7	63.6	-	-	6	66.7	3	33.3	1	5.0	9	45.0	10	50.0
paper for notes and working mathematics	-	-	-	-	11	100	-	-	5	55.6	4	44.4	-	-	5	25.0	15	75.0
Register forms for recording continuous test results	6	54.5	4	36.4	1	9.1	3	33.3	3	33.3	3	33.3	9	45.0	7	35.0	4	20.0

The data in Table 5 shows the internal condition of the teaching-learning classrooms in terms of the availiability of the basic classroom furniture, whereas Table 6 shows the extent to which the schools provide school requirements to teachers. As can be seen in Table 5,inadequacy of desks and benches for students is a common problem of both urban and rural schools. However, the condition is much more severe in urban schools. Hundered percent of urban respondent teachers rated the availability of desks and benches for students in the classrooms as inadequate. Whereas 66.7 percent of the rural respondents rated it as inadequate. Of the total respondents 85 percent of the teachers affirmed that the number of desks and benches available in the classrooms is inadequate. Similarly hundered percent of urban respondent teachers rated the classrooms as extremely poor having no tables and chairs for the teachers where as the condition in rural schools is some how in a relatively better condition.

The majority of respondents(60 percent) in both urban and rural schools rated their classrooms as having inadequate chalk-boards. But no classroom is reported to be with out a chalk-board. The majority of urban respondents (81.8 percent) and less than half of rural respondents(44.4 percent) have indicated that their classrooms have no notice-board at all. Similarly, 81.8 percent of urban and 55.6 percent of the rural teachers indicated a complete absence of duster in their class rooms.

Generally, the classrooms seem to be ill-equipped with most of the necessary furniture. Shortage of desks and benches for students, inavailability of tables and chairs for teachers, inadequacy of chalk-boards, and instructional materials are the common features of the classrooms of the surveyed schools. Besides, there exist disparity among rural and urban schools in terms of classroom furnishings. In fact, this is not a unique feature to the schools encompassed by this study. As it has been noted by Caillods and Postiethwaite (1989:172-173), and

Ross and Postlethwaite(1992:28), in many developing countries most of the primary school pupils have to sit on the floor. There are classrooms without a black board, and most of them have no sufficient sitting places for the students. Similarly, the MOE (1986:45)in the ERGESE project, also came up with the conclusion that most of the elementary schools' classrooms are poorly constructed and ill-equipped with the necessary basic furniture.

As can be seen in Table 6, exercise books provided by the school for preparing lesson plans are adequate according to 54.5 percent of urban teacher respondents. The condition in rural schools is much more diffrent from that of the urban schools. As it is shown in Table 6,77.8 percent of the rural teachers reported that they do not get exercise books adequately from their schools for preparing their lesson plans. Of the total respondents, 60 percent of the teachers affirmed that the exercise books provided by the schools are not adequate. But none of them have reported a complete absence of exercise books for lesson planning.

Nearly equal number of respondents from urban and rural schools (63.6 percent and 66.7 percent respectively) have indicated that their schools do not provide them with ball points and pencils adequately. Of all the respondents, the majority of them (65 percent) affirmed that ball points and pencils provided by their schools are not adequate. There are 35 percent respondents who reported that their schools do not provide these school requirements at all. The response of 75 percent of the teachers indicated that the schools do not provide mathematics teachers with paper for notes and solving mathematical problems.

Similar questions concerning the school requirements were included in the questionnaire given to the school directors to see their agreement or disagreement with the teachers' responses. As a result, all of the directors assured the inadequacy of ball points/pencils, and paper for notes and

solving mathematical prloblems. This substantiates the data obtained from the subject teachers in Table 6.

In general it seems that mathematics teachers of grade 8 in both urban and rural schools are not satisfied with the necessary school requirements provided by the schools for teaching.

Therefore, such a shortage or inavailability of basic classroom furniture and inadequacy of school requirements for teaching could likely influence the smooth running of teaching-learning processes and thereby affecting the end results of instruction. This means, it can influence negatively teachers' curriculum implementation attempt and the learning activities of students from being as effective as it should be.

TABLE 7

The Availability of Grade 8 Mathematics Curriculum Materials

Items	Teacher Respondents N= 20					
	Available		Not Available		Total	
	No	%	No	%	No	%
Syllabus	14	70.0	6	30.0	20	100
Teacher's Guide	15	75.0	5	25.0	20	100
Text book for all students	-	-	20	100	20	100

Two interesting results emerged from Table 7. These are the availability of the syllabus and the Teacher's Guide in the hands or teachers or schools of 70 percent and 75 percent of teachers respectively. The presence of the syllabus and the Teacher's Guide in the hands of teachers may have at least a reminding effect about their instructional activities. Put diffrently, it seems that the majority of teachers have at least some knowledge and understanding of the guidelines and specifications of the syllabus.

But, hundred percent of the respondents replied that text book for students are not available. The shortage of students'

text book is also reported by all of the school directors as a major implementation problem. However, the researcher has observed in some classrooms the existence of very few textbooks in the hands of students. Discussions made with school directors indicate that five textbooks per classroom were distributed for the students where the average class size is 86 students.

TABLE 8

The Extent to Which Instructional Materials for Grade 8 Mathematics Are Available in the SPCs.

Alternatives	Teacher Respondents	
	No	%
Abundently	-	-
To Some extent	13	65.0
None at all	4	20.0
No SPC at all in the school	3	15.0
Total	**20**	**100**

Table 8 presents information regarding the degree to which the school pedagogical centers have accumulated instructional materials relevant to the implementation of grade 8 mathematics syllabus. Most of the teacher respondents(65 percent) rated that SPCs have some instructional materials useful for their subject. The response of 15 percent of the respondents which signifies the complete absence of SPC in their school is in line with the response of one of the informant directors. This implies the existence of schools with no pedagogical centres at all.

A look at the results described in Table 8 reveals that the school pedagogical centers have made some attempts to meet the implementation demands of grade 8 mathematics syllabus. Though a mere presence of instructional materials in SPC does not assure their utilization in the classrooms, as 70 percent of the class sessions observed have not utilized any instructional materials (see Table 4), it points out the

existence of a favorable condition, in this respect, for the implementation of the syllabus.

The result of this study, however, contrasts to some extent with the finding of Amare (1998:289-298) who indicated that the inavailability of instructional materials is the most critical educational problem in Ethiopian schools. This difference might happen due to the specific nature of the present study. Since the contribution of the SPCs is accounted for in terms of a specific subject, those little attempts could be magnified. However, in the case of general investigations like that of Amare(1998), those little attempts might have been overlooked.

TABLE 9

Communication and Support Services Provided by the School Directors to the Implementation of the Syllabus

	Alter-natives	Teacher Respondents	
		No	%
The extent to which the director discusses with individual teachers or the department on issues related to the implementation of the syllabus.	*Frequantly*	2	10.0
	Rarely	9	45.0
	None at all	9	45.0
	Total	**20**	**100**
The number of times the director supervises teachers in their classrooms	*Once*	4	20.0
	Twice	8	40.0
	Three times	-	-
	Four times	-	-
	None at all	8	40.0
	Total	**20**	**100**
The support provided by the school directors to the implementation of mathematics syllabus	*High*	1	5.0
	Medium	3	15.0
	Low	16	80.0
	Total	**20**	**100**
The existance of a habit of mutual sharing of experiences and cooprative work among subject teachers in the school	*Yes*	*16*	*80.0*
	No	*4*	*20.0*
	Total	***20***	***100***

Since curriculum implementation needs a coordinated effort of diffrent people involved in the process, and the existence of efficient role relationship on the part of change agents,

the data summarized in Table 9, depicts the relationship of the directors with teachers, the support provided by the directors, and the existence of a habit of mutual sharing of experiences among mathematics teachers in a given school. The extent to which the directors discuss, with individual teachers or the department,issues related to the implementation of the syllabus is rated as a rare activity by 45 percent of the respondents. At the same time an equal number of respondent teachers (45 percent)rated as a complete absence of such activities on the part of the directors. This implies that according to 90 percent of respondent teachers, the directors do not discuss implementation issues with mathematics teachers or their department as much as they should do. Contrary to this, for a question like " Have you ever disscused this with mathematics teachers individually or in your department meeting?" three-fourth of the directors replied "yes". At the same time, the maximum number the directors supervised mathematics teachers in their classroom is once(20 percent), two times (40 percent) and none at all (40 percent) as reported by the teachers. Half of the directors have also affirmed that they have never visted at all mathematics teachers in their classroom while they are teaching.

Moreover,as can be seen in Table 9, the variation in the teachers assessment of their directors endeavour in giving adequate support to their instructional problems from high to low implies that not all directors are equally concerned. Ornstein and Hunkins (1998:228-243) have also noted that even though the school director is a key guarntee for successful implementation, not all directors are effective in this case. Only those who are knowledgeable and committed to the curriculum are successful. So, the result of this study seems to be in agreement with the idea suggested by Ornstein and Hunkins. The idea of Hall and his colleagues as cited in Fullan(1991:153) also substantiates the above idea. That is the degree of implementation of the innovation is diffrent in

diffrent schools because of the actions and concepts of the directors.

Consiquently, there is no doubt that the failure of the school directors in giving the necessary support for the teachers will have negative influence on the effective implementation of the syllabus.

In addition to the communication and support needed from the school directors, peer-support is also believed to contribute to the success of curriculum implementation. In this regard, as can be seen in Table 9, 80 percent of the teachers indicated the existence of the habit of mutual sharing of experiences and cooprative work among mathematics teachers in the school. In fact, within the school, a collegiality among teachers, mutual support, help, etc. are some strong indicators of implementation success. This result is consistent with the finding reported by Newmann and his colleagues as cited in Fullan(1998:2) which indicates that schools in which there is teachers' and directors' professinal learning community(collaborative work culture) are more successful. Through collaborative work culture, teachers will get practical solution to some of the problems faced in their individual classrooms, thereby greatly inhancing the success of curriculum implementation.

TABLE 10 Assessment of Period Alloted, Teaching Load and Class Size

	Alter-natives	Teacher Respondents	
		No	%
Adequacy of the period alloted to cover the portion with in the acadamic year	*Adequate*	4	20.0
	Inadequate	16	80.0
	Total	**20**	**100**
Does your teaching load caused a burden on you?	*Yes*	5	25.0
	No	15	75.0
	Total	**20**	**100**
Does the size of students per class created a problem on the proper implementation of the syllabus?	*Yes*	19	95.0
	No	1	5.0
	Total	**20**	**100**

As Table 10 indicates the period alloted to cover the portion within the academic year is inadequate according to 80

percent of the respondent teachers. The period alloted for grade 8 mathematics is four periods per week. However, most of the teachers say that they can not finish the contents of the textbook by using only four periods per week within a given academic year. Majority of the total respondents (75 percent) assured that their teaching load doesnot cause a burden on them. As it is also indicated in Appendix A, only very few of them (15 percent) have a total teaching load of 21 to 25 periods per week, which is nearly a maximum load in our school system. The rest (85 percent) are carrying below 21 periods per week.

Concerning the influence of class size, the data in Table 10, revealed that it is a felt problem by almost all of the respondent teachers (95 percent). According to the data obtained from the school directors the average number of students per classroom is 86. Hence,this large class size has influenced the proper translation of certain guide lines of the syllabus into practice.A chance was given in the questionnaire to report some of the instructional problems faced as a result of large class size. Thus according to their response the most repeatedly emphasized problems are difficulty to check home-work and class work, inability to apply grouping method of teaching, difficulty to recognize the individual problems of students, and inconvenience for evaluation. Thus, though some of the problems reported are general methodological issues which are not unique to mathematics classes some of them like the inability to check classwork and homework and to give feed back to students, and inability to divide students into groups and encourage them to solve problems in groups are directly related to the instructional requirements of the subject under study as shown in Tables 3 and 4.

Class size and teaching load are among the necessary conditions which need to be conducive for effective implementation of a syllabus. Some of the specific advantages of small class size are: use of greater variety of methods and materials in teaching, greater pupils' achievement, fewer

behavioural and deciplinary problems, and an increased teacher knowledge of the students. Therefore, in this perspctive, the response of teachers for the open ended questions seem to be real and practically faced problems. This result substantiates the finding of Amare(1998:289-298).

TABLE 11

Assesment of the Contents of the Textbook and the Teacher's Guide

	Alter-natives	Teacher Respondents	
		No	%
How do you rate the contents of the text book?	*very complex*	1	5.0
	complex to some extent	11	55.0
	Average	8	40.0
	Total	**20**	**100**
Are all of the contents in the textbook explained sufficently in the Teacher's Guide?	*Yes*	7	35.0
	No	13	65.0
	Total	**20**	**100**
Do you regularly use the text book as a major resource material in the classroom?	*Yes*	16	80.0
	No	4	20.0
	Total	**20**	**100**
Were you introduced to the new mathematics syllabus?	*Yes*	11	55.0
	No	9	45.0
	Total	**20**	**100**
Do you think that you need more training to implement the syllabues effectively?	*Yes*	18	90.0
	No	2	10.0
	Total	**20**	**100**

The data summarized in Table 11,desplayed the judgement of teachers towards the content of the subject organized in the textbook and Teacher's Guide as well as their capacity in transmiting the content to their students. Of the total respondent teachers, the majority of them(55 percent)rated the textbook as complex to some extent. At the same time 65 percent of the respondents described that most of the contents

in the textbook are not explained sufficiently in the Teacher's Guide. However, there are a considerable number of teachers (40 percent) who assured that the contents of the textbook are not so much complex, rather it is average and the contents are well explained (35 percent) in the Teacher's Guide. As we have seen the data in Table 7, though the majority(75 percent) of the teachers do have access to the Teacher's Guide, most of them (65 percent) are not satisfied with it. Furthermore, as 45 percent of them are not qualified in mathematics for teaching at grade eight(see Appendix A), and the same number of them (45 percent) are not introduced to the new mathematics syllabus or textbook, one cannot be surprised if the text-book happens to be complex for the teachers. When we examine the confidence of the teachers to transmit the content of the subject to their students, almost all of the respondents (90 percent) assured that they need some more training to implement the syllabus effectively. This is in line with the result obtained through classroom observation (see Table 4). That is in 42.5 percent of the classroom sessions, teachers were observed while exhibiting misunderstanding of some content elements of the subject they teach.

TABLE 12

Role Relationship and Structural Organization

	Alter-natives	Teacher Respondents	
		No	%
Do you believe that the current organizational structure of your school has negative impact on the implementation of the syllabus?	*Yes*	9	45.0
	Partially Yes	9	45.0
	No	2	10.0
	Total	**20**	**100**
Do you have a clear understanding of your duties and responsibilities in relation to the new curriculum?	*Yes*	7	35.0
	Partially yes	10	50.0
	No	3	15.0
	Total	**20**	**100**
Do you have a clear understanding of your role relationship with the principal and other teachers in the school in relation to the new education and training policy?	*Yes*	5	25.0
	Partially Yes	11	55.0
	No	4	20.0
	total	**20**	**100**

As curriculum implementation is a collaborative and team work, it requires a clear understanding and accpetance of the duties and responsibilities on the part of each party in the implementation process. Furthermore, the organizational structure within the schools can facilitate or hinder the effective implementation of any syllabus. In this regard as it is shown in Table 12, a little less than half of the total respondents(45 percent) believe that the current organizational structure of their schools have negative impact on the effective implementation of the syllabus. Similarly equal number of respondent teachers(45 percent) agree on the existence of influence, but according to them the condition is not severe. At the same time 65 percent of the respondent teachers do not have a clear understanding of their duties and

responsiblities in relation to the new curriculum. Only a few teachers (35 percent) have reported that they have a clear understanding of their duties and responsibilities. This implies that, though we are in a change process, the teachers are not still aware of their role as much as they should be.

Moreover, as it is displayed in Table 12, the response of the majority of teachers(75 percent) indicate that they do not have a clear understanding of their role relationship with principals and their colleagues in relation to NETP. This shows the extent to which principals, administrators, and curriculum workers are unconcerned to introduce teachers to what is exactly expected from them and in which ways they should travel the long journy of implementation process. This result indicates the existence of a gap between curriculum workers and the implementers. Put diffrently there is an absence of two-way communication between curriculum workers and implementers as well as among the implementers themselves. This result fails to be in line with the view of Ornestein and Hunkins(1998:292) who view curriculum implementation as an interaction process between those who have developed the programme and those who are charged to deliver it.

Therefore, the analysis of the data in Tables 5 to 12, and the discussions of the findings answer the third research question of the study. That is, how conducive is the learning-teaching environment in the schools and the classrooms for the full and effective implementation of the syllabus.

4.4 Factors Influencing the Implementation of Grade 8 Mathematics Syllabus

The results summarized in the following Table shows the factors which have influenced the implementation of the syllabus in their degree of Precedence.

TABLE 13

Mean Ranks and Rank Values of the Factors which Influence the Effective Implementation of the syllabus

No	Possible Factors	Teacher Respondents					
		Urban N = 11		Rural N = 9		The whole group N = 20	
		Mean	Rank	Mean	Rank	Mean	Rank
1	poor supply of students' textbook by the school	1.5	1	3.6	1	2.5	1
2	Inadequacy of the period alloted to cover the portion.	6.5	6	6.8	7.5	6.7	6
3	Low explicitness of the syllabus (i.e.unclear teaching procedures)	5.7	5	8.8	12	7.1	7
4	Teachers' disinterestedness towards teaching mathematics.	10.7	11	8.6	10	9.8	11
5	Lowness of the support to teachers from the school director.	11.1	12	8.7	11	10.1	12
6	Lowness of the support provided by the pedagogical centere	9.1	10	6.8	7.5	8.0	10
7	Absence of inservice training for teachers directed to mathematics syllabus.	5.4	4	5.0	4	5.2	4
8	Too many of students per class - room (large class size)	3.4	3	4.7	3	4.0	3
9	Students traditional belief of the subject as difficult	7.0	8	5.2	5	6.2	5
10	The irrelevance of the contents of the syllabus with the maturity level of the students(Beyond their capacity)	2.7	2	3.8	2	3.2	2
11	Inadequate preservice training of teachers	8.2	9	6.7	6	7.6	9
12	The absence of introducing teachers to the new syllabus and textbook.	6.6	7	8.0	9	7.2	8

As can be seen in Table 13, a list of factors which are supposed to have impact on the implementation of the syllabus are given ranks by mathematics teachers of grade eight according to their degree of influence. Through this, poor supply of students' textbook by the school, the irrelevance of the content of the syllabus with the maturity level of the students (beyond their level), large class size, absence of inservice training for teachers directed to mathematics syllabus, students' traditional belief of the subject as difficult, and inadequacy of the period alloted to cover the portion are those factors which took the upper six ranks. In other words, these are rated by teachers as the most influencial factors hindering the effective implementation of the syllabus. But as can be seen in Table 11, the textbook is rated as complex to some extent by the majority of the teachers and at the same time a considerable number of them are under qualified for the level(see Appendix A). In addition to this, misunderstanding of some content elements by the teachers was observed in 42.5 percent of the class sessions(see Table 4). Therefore, these results do not prove the irrelevance of the contents of the syllabus to the maturity level of students. The students are not taught the content of the subject by proper and effective teachers. Though the result of the study indicates the contents to be difficult for the students, the real source of this difficulty lies on the capability of teachers to transmit the content effectively to their students.

Absence of inservice training opportunities in the form of workshops, seminars, refresher courses, and summar education, directed to a specific subject is also reported by the teachers as one of the seriously felt problems. As Sounders and Vulliamy(1983:361) have remarked, unless teachers are helped to develop new lesson, content and new teaching skills through inservice training, they will revert to the pre-innovation practice. This result also supports the finding reported by Mekasha(1991:69-72) where one of the causes for the ineffectiveness of teachers in implementing the Home Economics

Syllabus was the total absence of workshops or on-the -job training exposure for teachers. Therefore, had there been a certain kind of regular inservice training programme, teachers of the same subject would get opportunity to discuss their common problems together with regard to the contents of the syllabus.

At the same time those factors like: lowness of the support to teachers from the school directors, teachers disinterestedness towards teaching mathematics, and the lowness of the support provided by SPCs took the lower ranks denoting a minimal influence on the implementation of the syllabus. This means that these factors are not felt problems of teachers in their implementation endeavours. When we examine the rating of teachers interms of school types, there is no magnified diffrences in ranks given by both urban and rural respondent teachers, except at one point where rural respondent teachers show a variation by giving the lowest rank for the factor low explicitness of the syllabus(unclear teaching methodology). This factor has occupied the fifth rank by the rating of urban respondent teachers. This may be due to the variation in their attitudes towards the syllabus(see Table 2).

Furthermore, the school directors were asked to enumerate some of the problems faced in their schools with regard to the implementation of grade 8 mathematics syllabus. As a result the repeatedly mentioned problems are: shortage of qualified teachers, shortage of students' textbook, shortage of instructional materials, large class size, and students' weak background of the subject. The same open ended question was also included in the questionnire of teachers in order to triangulate their responses obtained through the rank order on the same questionnaire. As a result a complete agreement with data of rank order as well as the report of the directors was obtained. However, a considerable number of teachers have mentioned language as a factor hindering the implementation process. According to these teachers, the students have critical problem to communicate with their teachers as well as

the curriculum materials. This is because of the fact that most of students have problem of communicating in both Amharic and English languages. This is a felt problem particularly in rural schools. To this end, the researcher has observed in one of the sample school's compound while a grade 8 student of the school and her teacher are talking through translator on acadamic issues. This implies the extent to which there is a communication gap between teachers and students.

Therefore, the data in Table 13, and its discussion of findings togther with other findings of the study answer the fifth research question of the study. That is, as to what are some of the constraints which affect the implementation of the mathematics syllabus of grade 8.

4.5. Students' Test Results

Table 14 shows the proportion of students who scored above the minimum mastery level and those who scored below it in the sub-tests pertaining to the seven instructional objectives.

TABLE 14

Percentage of Grade 8 Students Who Scored Above and Below the Cut-off Score in the Test per Objective

Instructional objectives	Sex	Students				total	
		above the cut-off score		Below the cut-off score			
		No	%	No	%	No	%
ONE	M	61	23	199	77	260	100
	F	22	12	158	88	180	100
	M+F	83	19	357	81	440	100
TWO	M	89	34	171	66	260	100
	F	28	16	152	84	180	100
	M+F	117	27	323	73	440	100
THREE	M	139	53	121	47	260	100
	F	59	33	121	67	180	100
	M+F	198	45	242	55	440	100
FOUR	M	127	49	133	51	260	100
	F	51	28	129	72	180	100
	M+F	178	40	262	60	440	100
FIVE	M	183	70	77	30	260	100
	F	94	52	86	48	180	100
	M+F	277	63	163	37	440	100
SIX	M	219	84	41	16	260	100
	F	127	71	53	29	180	100
	M+F	346	79	94	21	440	100
SEVEN	M	44	17	216	83	260	100
	F	14	8	166	92	180	100
	M+F	58	13	382	87	440	100

The first instructional objective requires students to develop their capacity in working with variables. The second instructional objective demands students to acquire skills for

using rules of transformation of terms involving variables that are derived from the rules of calculating rational numbers. As to the data in Table 14, for the first instructional objectives the majority of the students(81 percent)scored below the minimum mastery level. Similarly, concerning the second instructional objective, as seen in terms of both sexes, more number of students (73 percent) fall within the below cut-off score category. When the two sexes are seen separetly, boys tend to be at a relatively better condition than girls with respect to the first and the second instructional objectives. However, in both sexes the first two instructional objectives are not attained by the majority of the students, implying ineffectiveness of the implementation process in terms of the two objectives.

The third and fourth objectives aim to familiarize students with the notions "relations" and "functions" , and make known to students the properties of linear functions with their graphical representation. The data in Table 14 shows that a little less than half of the total students(45 percent) have achieved above the minimum mastery level in the sub-test for the third objective, with considerable variation among the two sexes. Concerning the fourth instructional objective, again only 40 percent of the students have scored above the minimum mastery point in the subtest. Though boys tend to be in a relatively better condition with regard to objectives three and four, both objectives are not attained by the majority of students by both sexes.

The results shown regarding the fifth and sixth instructional objectives are diffrent from the first four objectives. The majority of the students(63 percent)of both sexes scored above the minimum cut-off score on the sub-test for objective five, and 79 percent of them scored above the minimum cut-off score for objective six. These results indicate a relative attainment of the objectives by the majority of students, implying the effectiveness of the

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implementation process in terms of the fifth and sixth instructional objectives.

The last instructional objective reads " the students will be able to extract rational square roots and approxmiate values of nonrational square roots with the help of numerical tables". The data shown in Table 14 indicates that among the seven objectives this is the least attained one by the majority of students by both sexes. Only 13 percent of students have achieved above the minimum mastery level in the sub-test with out a big variation among the two sexes.

Although the students' test results that indicate the accomplishment of the objectives should not be attributed to only the instructional process going on in the schools; as there are a number of out-of-school factors like:home, students' background, and individual diffrence characteristics to be accounted for, the schools' instructional processes have more influence on the students' cognition. With this perspective then, the students' test results reported in Table 14, revealed that some of the instructional objectives are attained by the majority of the students indicating the effectiveness of the implementation process, and there are some others which are not grasped by the majority of the students. In this regard, among seven instructional objectives only two of them(fifth and sixth) are found to be attained by the majority of the students. But the test scores pertaining to the remaining five objectives indicate that the students have not acquired basic knowledge in the area. This implies the low level implementation of the specifications of the syllabus. Therefore, even though the study is not a correlational one to detect the specific cause and effect relationship, the inavailability of students' textbook,the under qualification of teachers for the level, the complex nature of the contents of the textbook for both students and teachers, the lowness of the teachers' attitude towards the intents of the syllabus and all other factors discussed before seem to have contributed to the

ineffectiveness of the implementation process to attain most of the instructional objectives.

Therefore, the expected out comes of the syllabus covered during the first semester are not well-grasped by the majority of the students, and this may indicate the ineffectiveness of implementation process. Moreover, to see whether there is a diffrence or not in the level of attainment of the objectives among the weredas from which the sample was taken the proportion of students who passed and who failed at wereda levels are presented in Table 15.

TABLE 15

Distribution of Students who Scored Above and Below the Cut-Off Score in the Test per Objective by Woreda

Instructional Objectives	Achievement Level	Students				Total
		Awassa	Aleta-Wondo	Dale	Shebdino	
ONE	At or above the Cut-off Score	22	25	24	12	83
	Below the Cut-Off Score	88	85	86	98	357
	Total	**110**	**110**	**110**	**110**	**440**
	$X^2 = 6.336$					
TWO	At or above the Cut-off Score	50	31	17	19	117
	Below the Cut-Off Score	60	79	93	91	323
	Total	**110**	**110**	**110**	**110**	**440**
	$X^2 = 32.073*$					
THREE	At or above the Cut-off Score	69	50	37	42	198
	Below the Cut-Off Score	41	60	73	68	242
	Total	**110**	**110**	**110**	**110**	**440**
	$X^2 = 21.778*$					
FOUR	At or above the Cut-off Score	56	43	43	36	178
	Below the Cut-Off Score	54	67	67	74	262
	Total	**110**	**110**	**110**	**110**	**440**
	$X^2 = 7.945*$					
FIVE	At or above the Cut-off Score	78	65	67	67	277
	Below the Cut-Off Score	32	45	43	43	163
	Total	**110**	**110**	**110**	**110**	**440**
	$X^2 = 4.08$					
SIX	At or above the Cut-off Score	95	85	85	81	346
	Below the Cut-Off Score	15	25	25	29	94
	Total	**110**	**110**	**110**	**110**	**440**
	$X^2 = 5.787$					
SEVEN	At or above the Cut-off Score	15	22	12	9	58
	Below the Cut-Off Score	95	88	98	101	382
	Total	**110**	**110**	**110**	**110**	**440**
	$X^2 = 7.385$					

* Significant at P $\leq$0.05 level

N.B:- See the calculation of the chi-squar Statistics in Appendix G

* Significant at P ≤0.05 level

N.B:- See the calculation of the chi-square Statistics in Appendix G

Since the obtained chi-square value(x^2 = 6.336) to the proportion of students who passed or failed pertaining to the first instructional objective is less than the critical chi-square value (x^2, df = 3, 0.05 = 7.815), there is no statistically significant diffrence among the woredas in the level of attainment of this particular objective at P ≤ 0.05 level. This means in all the woredas the proportion of students who belong to the pass and fail categories do not show a statistcally significant diffrence. In short, this instructional objective is attained by nearly equal proportion of students from each woredas.

The computed chi-square value (x^2 = 32.073) with regard to the second instructional objective is by far greater than the critical chi-square value (x^2, df = 3, 0.05 = 7.815). Hence, there is a statistically significant diffrence in the level of attainment of the objective among the woredas at P ≤ 0.05 level. In other words, the proportion of students who belong to the pass and fail categories differ among woredas. To detect the diffrences accounted for,a pairwise comparison was made. The results show that Awassa differs significantly from all the three woredas. At the same time there is also significant diffrence between Aleta Wondo and Dale Woredas at P ≤ 0.05 level. Similarly the computed chi-square value (x^2 = 21.778) with regard to the third objective is by far greater than the critical chi-square value (x^2 , df = 3, 0.05 = 7.815). This indicates the existence of significant difference among the woredas in the level of attainment of the third instructional objective . To detect this diffrencec pairwise comparison was made among the woredas. The result shows that there exist statistically significant diffrences between Awassa and each of the three weredas at P ≤ 0.05 level. A look at the data in Table 15 also shows that in two of the woredas, Awassa and Aleta Wondo,a relatively more number of students scored

above the minimum mastery level than the other two woredas with respect to objectives two and three.

Concerning the fourth instructional objective, the computed chi-square value (x^2 = 7.945) is a little greater than the critical chi-quare value (x^2 , df = 3, 0.05 = 7.815). There is a statistically significant diffrence in the level of attainment of this objective among the woredas. Then the pairwise comparison indicates that the diffrence is accounted for by the proportion of students in Awassa as compared to those in Shebedino at $P \leq 0.05$ level of significance. This means the proportion of students who got pass mark in Awassa Woreda is larger than the students in Shebedino Woreda.

The next is the fifth instructional objectiive, Since the obtained chi-square value(x^2 = 4.08) is less than the critical chi-square value (x^2, df = 3, 0.05 = 7.815),there is no statistically significant diffrence among the proportion of students who passed and failed among the woredas at $P \leq 0.05$ level of significance. It is also the same for the sixth and seventh instructional objectives, where the computed chi-square values (x^2 = 5.787 and x^2 = 7.385) respectively are below the critical chi-square value (x^2,df = 3, 0.05 = 7.815). Thus there is no statistically significant diffrence in the level of attainment of objectives: five, six and seven from the four woredas at $P \leq 0.05$ level of significance.

In general the data in Table 15 revealed that among the seven instructional objectives, there is statistically significant diffrences in the level of attainement of the three objectives (second,third, and fourth) among the four woredas at $P \leq 0.05$ level of significance. Whereas there is no statistically significant diffrence in the level of attainment of the other four instructional objectives among the woredas.

The existence of such a statistically significant diffrence in the level of attainment of the objectives partly indicates a diffrence in the relative emphasis given to the implementation of the syllabus. In this case, then some of the

instructional objectives(second,third,and foruth) which have been treated unequally among the woredas, as revealed by the students' test result(see Table 15), are those which require the use of discovery methods and guided practice on the part of the teachers.

TABLE 16

Percentage of Students who Scored Above and Below the Minimum Requirement of the NETP by Woreda

Students	Sex	Catagory					
		Above fifty percent		Below fifty percent		Total	
		No	%	No	%	No	%
Awassa	M	48	69.5	21	30.5	69	100
	F	9	22.0	32	78.0	41	100
	M+F	57	51.8	53	48.2	110	100
Aleta Wondo	M	22	35.5	40	64.5	62	100
	F	6	12.5	42	87.5	48	100
	M+F	28	25.5	82	74.5	110	100
Dale	M	14	22.2	49	77.8	63	100
	F	4	8.5	43	91.5	47	100
	M+F	18	16.4	92	83.6	110	100
Shebedino	M	22	33.3	44	66.7	66	100
	F	3	6.8	41	93.2	44	100
	M+F	25	22.7	85	77.3	110	100
TOTAL	M	106	40.8	154	59.2	260	100
	F	22	12.2	158	87.8	180	100
	M+F	128	29.0	312	71.0	440	100

The data in Table 16 shows the proportion of students who scored above the minimum achievement requirement stated in the New Education and Training Policy and below it. The requirement of the policy read: " In order to get promoted from one level to the next, students will be required to have a minimum of fifty percent achievement." With this perspective, out of the total students (440) who have taken the test in both sexes, only 128 (29 percent) of the students scored above fifty percent. Where as 312(71 percent) of the students scored below

fifty percent in all the test items. A considerable diffrence is also observed among the two sexes. A higher number of boys(40.8 percent) appear to be in the pass category as compaired to 12.2 percent of their female counterparts. There is also variation in the proportion of students who are in the pass and fail categories among the woredas. For instance, 51.8 percent of students in Awassa Woreda have got a pass mark, whereas only 16.4 percent of students in Dale Woreda got the pass mark. Similarly, 25.5 percent of Aleta Wondo and 22.7 percent of students in Shebedino Woredas scored above fifty percent with considerable variation in both sexes.

In general the test results of students in terms of the minimum mastery level cut-off score decided by judges (see Table 1) as well as in terms of the minimum requirement "fifty percent' achievement set on the NETP, seem not satisfactory. Hence, most of the students in grade 8 have not acquired the necessary knowledge and skills from mathematics instructions covered during the first semester. This may imply the ineffectiveness of the implementation process of the syllabus.

Therefore, the data in Tables 14 to 16, and their discussions answer the fourth research question of the study. That is whether the implementation of the mathematics syllabus is effective in enabling learners to have mastery of the subject matter or not.

CHAPTER 5

SUMMARY, CONCLUSION AND RECOMENDATIONS

5.1 SUMMARY

The study was intended to evaluate the implementation of grade eight mathematics syllabus and to identify the outcome as well as the problems encountered in translating it into practice in SNNP Region with specific reference to Sidama Zone. To this effect, the descriptive survey approach was employed as a method of the study. In line with this, four schools were selected as sources of information from the four woredas of the zone. Questionnaire, classroom observation, and achievement test were the data collection instruments used to obtain information from the teachers, school directors, and students of the sample schools.

On the basis of the analysis made on the data secured through these instruments, the summary of the findings is presented as follows:

First, it is observed that a certain proportion of teachers exhibited low level of interest in the specifications of grade 8 mathematics syllabus both in urban and rural schools. But the proportion is higher (81.8 percent) for urban schools teachers as measured by the attitude scales. It is found that 45 perecnt of the teachers are assigned to teach mathematics at grade 8 without their qualification for teaching the subject.

Second , as to the actual implementation of the basic instructional elements (guided practice, demonstration, and discovery methods) suggested in the Syllabus and the Teacher's Guidec it is found out that none of these strategies are used frequently by the majority of the teachers. The dominantly used teaching sterategies observed in the classrooms are writing notes on the black-board, and lecturing. These

strategies were used frequently (80 percent)by teachers in the class sessions observed. The majority of the teachers give classwork and homework for their students. However, they fail to monitor students while they are doing classwork and they also rarely check and give corrections for the classwork and homework. In 70 percent of the class sessions observed, the lessons are presented without any use of instructional materials such as charts, coloured chalk, tables of values, and protractor. In the lessons observed, it is found out that about 67 percent of the time, classes are conducted without relating the lesson to the day-to-day(contemporary) affairs such as the types of relationships among the family and community, and the geometric shapes of objects arround us.

Third, the classrooms are ill-equipped with some of the necessary furniture. About 85 percent of the teachers rated their classrooms as having inadequate desks and benches for students, and at the same time 85 percent of the respondent teachers have indicated the inavailability of tables and chairs for teachers in the classrooms. Moreover, there is a clear disparity between the urban and rural schools in terms of the classroom furniture and equipment. Rural schools have relatively better facilitated classrooms than urban schools. In addition to this, most of the teachers are not satisfied with the school requirements provided by the school such as exercise books for preparing lesson plans, ballpoints, and paper for tests and doing mathematical exercises and problems.

Fourth,about 75 percent and 70 percent of the respondents indicated the availability of the syllabus and the Teacher's Guide. All the respondents in the rural and urban schools (100 percent) reported the absence of students' textbook in the schools.

Fifth, as has been rated by 65 percent of the teacher respondentsc the school pedagogical centres have tried to accumulate some instructional materials relevant to the implementation of grade 8 mathematics syllabus.

Sixth, there is no frequent communication between the directors and teachers to discuss some implementation issues regarding the teaching of mathematics. This implies that not all school directors are equally concerned with the instructional problems of mathematics teachers. About 80 percent of the respondents have indicated that there is a habit of mutual sharing of experience and cooprative work among mathematics teachers in the school.

Seventh, nearly 80 percent of the respondents tell that the period alloted to cover the contents of grade 8 mathematics within the academic year is very short. The majority of the teachers (95 percent) reported that class size is the major problem in the implementation of some of the specifications of mathematics syllabus.

Eight, with regard to the contents of the textbook and the Teacher's Guide, more than half of the teachers(55 percent) rated the content of the textbook as complex. Furthermore 65 percent of the respondents affirmed that the contents in the textbook are not sufficiently explained and elaborated in the Teacher's Guide.

Ninth, a little more than half(55 percent) of the respondent teachers reported that they were introduced to the new mathematics syllabus of grade 8 through short period workshops and seminars. However, a considerable number of teachers(45 percent) have not been oriented with the syllabus by any means. As a result, 90 percent of the respondent teachers feel that they need more training to implement the syllabus effectively.

Lastly, as measured by the achievement test the expected outcomes of the syllabus covered during the first semester are not well-grasped by the majority (71 percent) of the students. From among the seven instructional objectives, it is only in two of them that the majority (63 percent and 79 percent)of the students seem to have acquired some basic knowledge. In addition, students from diffrent Woredas show a statistically significant diffrence in the level of attainment of some of the

instructional objectives. This points out the existence of diffreneces in the relative emphasis given to the implementation of the specifications of the syllabus. Moreover, only 29 percent of the students have scored a pass mark, at or above 50 percent which is stated on the NETP, as a minimum achievement requirement to pass from one level to another.

5.2 CONCLUSION

From the findings, it can be concluded that the mathematics syllabus of grade eight is not implemented as intended in SNNP Region specifically in Sidama Zone. There is a wide gap between the designed intents of the syllabus and what is actually being implemented in practice. This has been evident from the teachers' actual classroom instructional performance and the students' test result. Most of the instructional demands of the syllabus are not translated into practice in the classrooms. Teachers in most of the class sessions teach facts of mathematics to their students rather than teaching the skill required in mathematics. As a result, most of the mathematics class time was used for writing and copying the lesson from the black board, and not in doing mathematics. Consequantly, the majority of the students failed to obtain the expected outcomes of the subject.

The existence of unfavourable conditions in the schools, the limited mathematics skills of teachers to transmit the content of the subject, as well as other factors discussed in this study appear to contribute to the limited success of the implementation process, in addition to the negative attitudes of most teachers towards the intents of the syllabus. Among the in-school factors, the pressence of ill-equipped classrooms with the necessary furniture, inadequacy and in some cases a complet absence of the necessary school requirements for teaching, inavailability of the students' text book, and the existence of some school directors who are less concerned with the instructional problems of mathematics teachers are the most prominent ones. In addition to this, the nature of the

contents of the textbook, large class size, the absence of on-the-job training for teachers, and the students' traditional belief of the subject as difficult seem to have aggravated the problem.

Therefore, it seems that the gap between the intents of the syllabus and the actual implementation practice will continue unless the implementation barriers discussed in this study are dissolved as much as possible.

5.3 RECOMMENDATIONS

In the light of the findings of the study it seems reasonable to suggest the following recommendations:

❶ It has been pointed out in the study that there are a considerable proportion of teachers who show low agreement towards the specifications of the syllabus. Thus, in order to reduce the problem and increase the awareness of the teachers towards the syllabus, continuous workshops and seminars on issues related to the aims and contents of mathematics should be organized by the woreda education offices and zonal education departments.

❷ Lack of students' textbook has been consistently rated by teachers as well as school directors as one of the leading factors influencing the implementation of the syllabus. Thus, attention should be given to maintain adequate and proportional distribution of textbooks by the Regional Education Bureau and Zonal Education Department.

❸ In order to reduce misunderstanding of some content areas of the subject by the teachers, school directors should assign appropriate and qualified teachers for the level to teach mathematics. At the same time mathematics departments have to strengthen their existing culture of mutual sharing of experience and cooperative working habit.

❹ As it has been found in the study, the contents of the syllabus are complex for both teachers and students, and lack acceptance on the part of the teachers. Hence, the

contents of the textbook, large class size, the absence of on-the-job training for teachers, and the students' traditional belief of the subject as difficult seem to have aggravated the problem.

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3. In order to reduce misunderstanding of some content areas of the subject by the teachers, school directors should assign appropriate and qualified teachers for the level to teach mathematics. At the same time mathematics departments have to strengthen their existing culture of mutual sharing of experience and cooperative working habit.
4. As it has been found in the study, the contents of the syllabus are complex for both teachers and students, and lack acceptance on the part of the teachers. Hence, the

concerned parties such as ICDR should device a mechanism to revise the syllabus and incorporate the opinion and views of the teachers in the syllabus so that the teachers could develop their commitment for effective implementation of the syllabus.

❺ The mismatch between the textbook and the Teacher's Guide has been indicated in the study. The difficulty level of the textbook is also given due attention by the teachers. Therefore, in order to reduce this problem, the SNNP Regional Education Bureau has to make content analysis of the textbook and the Teacher's Guide so that the organizational structure of the contents will be efficient and the match between the materials will be maintained.

❻ In order to increase the capability of teachers' in transmitting the contents of the subject to their students,upgrading of teachers' qualification has to be given due attention. The recently started system of upgrading teachers' qualification through distance education needs to be encouraged. In addition to this , diffrent mechanisms of on-the-job training such as summer education has to be facilitated.

❼ As it has been found in the study, the inadequacy of the instructional facilities and large class size in the schools are some of the factors inhibiting the effective implementation of the syllabus. Therefore, in order to reduce this problem, administrations of the schools as well as the Woreda educational offices have to device mechanisms to fulfil the shortages of instructional facilities and to construct some more classrooms. Mechanisms like finding doner agencies as well as individuals, and planning income generating activities, in addition to the proper utilization of their allocated budget have to be given due attention.

❽ Since the study is confined to the evaluation of practices going on in one region and a specific zone of the country, interested researchers in the field can take this issue and investigate it in another setting to see the practices of other regions and zones.

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APPENDIX A

Personal Profile of the Teacher Respondents

Items	Choices	Teacher Respondents	
		No	%
Sex	Male	14	70
	Female	6	30
	Total	20	100
Qualification level	College deploma in mathematics	11	55
	College deploma in other subject	4	20
	12 + TTI	5	25
	Total	20	100
Total years of experiance in teaching	6-10 years	3	15
	11-15 years	3	15
	16-20 years	3	15
	21-25 years	4	20
	26-30 years	7	35
	Total	20	100
Experiance in teaching mathematics in grades 7 and 8	1-5 years	4	20
	6-10 years	1	5
	Above 10 years	15	75
	Total	20	100
Teaching Subjects Other than Mathematics	Yes	2	10
	No	18	90
	Total	20	100
Teaching load in periods per week	Less than 10	1	5
	10-15	8	40
	16-20	8	40
	21-25	3	15
	Total	20	100
Involvement in extra curricular activities in the school	Yes	11	55
	No	9	45
	Total	20	100

APPENDIX B

ADDIS ABABA UNIVERSITY

SCHOOL OF GRADUATE STUDIES

FACULITY OF EDUCATION

DEPARTMENT OF CURRICULUM AND INSTRUCTION

Questionnaire for Mathematics Teachers of Grade 8

The purpose of this questionnaire is to collect information about the implementation of grade 8 mathematics syllabus. The information to be obtained through the questionnaire is going to be used only for research undertaking. Therefore, the coopration of mathematics teachers by giving genuine information is highly valuable to complet the study. No need of writing your name on the questionnaire.

Thank You in advance for your coopration.

PART I

Direction: Please mark with a tick(✓) your responses on the space provided except the questions which require written responses.

Name of the School : _____

Wereda: _____

1. Sex of the respondent : Male : _____
   Female : _____
2. Age of the respondent : _____ years
3. Currently you are assigned to teach mathematics at:
   - Grade 8 only : _____
   - Grade 7 and 8 : _____
   - Any other : _____
4. Qualification:
   - College Deploma in mathematics : _____
   - College Deploma in other subject : _____

PART II

Direction: On the following pages put a mark with a tick (✓) what your opinion is with respect to each statement in only one of the five alternatives. i.e,

5 = Strongly Agree

4 = Agree

3 = Undecided

2 = Disagree

1 = Strongly Dissagree

Ser No	Statements	5	4	3	2	1
1	The current mathematics syllabus of grade 8 causes a burden on teachers, specifically it requires too much preparation to teach.					
2	Most of the aims and objectives of grade 8 mathematics which are written on the syllabus and teachers' guide are acceptable					
3	The Teacher's Guide of grade 8 mathematics help teachers very much for planing their teaching strategies.					
4	The organization of the contents of grade 8 mathematics syllabus is not conveniient for teaching.					
5	After completing grade 8 mathematics instruction, students' knowledge and abilities will be developed and they could realize a complet and logical thinking					
6	The application of grade 8 mathematics in other subjects of the same grade level is significant					
7	The pressence of adequate exercises at the end of each topic in the text book in hibit the teacher from using other referance materials.					

Ser No	Statements	5	4	3	2	1
8	Plane geometry has to be given wide coverage at grade 8 level.					
9	Most of the contents of mathematics syllabus of grade 8 are above the maturity level of the students hence, are difficult to be mastered by the students					
10	The design of grade 8 mathematics syllabus encourage teachers to use various instructional methods and techniques inorder to increase students' participation.					
11	The major task of mathematics teachers at grade 8 level should be to encourage students to memorize all definitions and theorems at this level rather than worrying about their proofs					
12	Since the ideas and views of mathematics teachers are incorporated in the current grade 8 mathematics syllabus, its implementation is expected to be effective.					
13	Students are not expected to carryout proofs independently at grade 8 level.					
14	The aims and objectives of the current mathematics syllabus of grade 8 are difficult to be implemented effectively.					

PART III

3.1 DIRECTION:- Indicate Your responses for the following questions by circling the letter of your choice except the questions which require written responses.

1. Is there a syllabus of grade 8 mathematics in your school or at your hand? A. Yes B. No
2. Do you have the Teacher's Guide of grade 8 mathematics in your school or at your hand?
   A. Yes B. No
3. If your answer to question number 2 is "No", explain how you are planning and guided?_____
   _____
4. Adequacy of the period alloted to cover the portion with in the academic year
   A. Adequate
   B. Inadequate
   C. More than enough
5. Do you think that you need more training to implement the syllabus effectively? A. Yes B. No
   If your Answer is "Yes" in what way? _____
   _____
   If your answer is "No" Why not? _____
   _____
6. Does your teaching load caused a burden on you ?
   A. Yes B. No
7. To what extent does the school pedagogical center acumulated instructional materials relevant to teaching mathematics of grade 8?
   A. Abundently B. To some extent C. None at all
   D. There is no pedagogical center in the school
8. Does the size of the students per class created a problem on the proper implementation of the syllabus?
   A. Yes B. No

9. If your answer for question number 8 is "Yes", please mention the instructional problems you have faced in brief._____

_____

10. Is there a mathematics department in your school?
    A. Yes B. No
11. How often does the director discuss with you individually or through mathematics department on issues related to the implementation of the syllabus?
    A. Frequently B. Rarely C. None at all
12. How many times in a year, does the director of the school supervise you in your classroom?
    A. Once B. Twice C. Three times D. Four times
    E. None at all
13. How do you rate the support provided by the school director to the implementation of the mathematics syllabus of grade 8?
    A. High B. Medium C. Low
14. The nature of the contents of the text book can affect the understanding of both the teacher and the pupils, with this regard, how do you rate the text book?
    A. It is very complex
    B. It is complex to some extent
    C. It is average D. It is very simple
15. Are all contents in the text book explained sufficently in the Teacher's Guide?
    A. Yes B. No
16. Do you regularly use the text book as a major resource material?
    A. Yes B. No
17. Do you usually use reference books for teaching other than the text book?
    A. No, I don't use because I couldnot get any
    B. No, I don't use because the text itself is adequate
    C. Yes, I use various reference books.

18. Is there a habit of mutual sharing of experiance and cooprative work among mathematics teacher in your school?
A. Yes B. No

19. If your answer for question number 18 is "Yes" describe the ways briefly?_____

_____

20. If your answer for question number 18 is "No", please explain the reason? _____

_____

21. Do you believe that the current organizational structure of your school has negative impact on the implementation of the syllabus?
A. Yes B. Partially yes C. No

22. Do you have a clear understanding of your duties and responsibilities in relation to the new curriculum?
A. Yes B. Partially Yes C. No

23. Do you have a clear understanding of your role relationship with the principal and other teachers in the school in relation to the new education and training policy?
A. Yes B. Partially Yes C.No

24. Were you introduced with the new mathematics syllabus of grade 8 through diffrent seminars or workshopes?
A. Yes B. No

25. You are assigned to teach mathematics on the bases of
A. Your interest
B. The School director's assignement without your interest

26. What are the major problems you faced in implementing the mathematics syllabus of grade 8?

_____

_____

3.2.A **DIRECTION:-Please Mark with a tick (✓) your responses in only one of the three alternatives by assessing the internal facilities of the classrooms in which you are teaching mathematics.**

Ser. No.	Classroom Furniture	Adequat	Inadequate	None existance
1	Students' desks			
2	Benches (chairs) for students			
3	Table and Chair for the teacher			
4	Chalk board			
5	Notice board			
6	Dasture			
7	Instructional materials for mathematics			

3.2.B. **DIRECTION:-Please indicate by a tick(✓) how for the school provides you the following school requirements for teaching**

Ser. No.	Requirements for teaching	Adequatly	Not adequatly	Not at all
1	Exercise books for preparing lesson plans			
2	Ball points /pencils			
3	paper for tests			
4	paper for notes and working mathematics			
5	Register forms for recording continuous test results			

PART IV

DIRECTION:- After reading the following list of possible factors, give rank according to their level of influence on the implementation of grade 8 mathematics syllabus on the space provided infront of each statement.

N.B Those factors which have strong influence should take the upper ranks (1,2,3,...) and those which have minimal influence should take the lower rank (...10,11,12).

Ser. No	Possible Factors	Rank
1	Poor supply of students' text book by the school	
2	Inadequacy of the period alloted to cover the portion	
3	Low explicitness of the syllabus(i.e. Unclear teaching procedures)	
4	Teachers' disinterestedness towards teaching mathematics	
5	Lowness of the support to teachers from the school director	
6	Lowness of the support provided by the pedagogical centr	
7	Absence of inservice training for teachers directed to mathematics syllabus	
8	Too much number of students per claas-room (large class size)	
9	Students' traditional belief of the subject as difficult	
10	The irrelevance of the content of the syllabus with the maturity level of the students(Beyond their level).	
11	Inadequate pre-service training of teachers	
12	The absence of introducing teachers with the new syllabus and text book.	

APPENDIX C

ADDIS ABABA UNIVERSITY

SCHOOL OF GRADUATE STUDIES

FACULITY OF EDUCATION

DEPARTMENT OF CURRICULUM AND INSTRUCTION

DATA TO BE COLLECTED FROM PRIMARY SCHOOLS DIRECTORS

This questionnaire is designed to collect information about the implementation of grade 8 mathematics syllabus from the school directors. The information to be obtained is going to be used only for research purpose inorder to produce a thesis about the implementation of grade 8 mathematics syllabus in SNNP Region with specific reference to Sidama Zone. Your assistance and frank response are highly valuable to complet the study.

Thank you in advance for your cooprotion

DIRECTION:- Please respond to the following questions: with a tick(✓) to your response in the space provided, by circling the letter of your choice or by writing a complet answer on the space provided.

1. Name of the school: _____
   Wereda: _____
2. Age of the Respondent: _____
3. Qualification of the Respondent: _____
4. Years of experiance as a director : _____
5. The number of teachers in your school
   Male _____ Female _____
6. Distribution of the number of teachers by qualification in the school:
   Colleg Diploma _____ 12 + TTI _____
   12 + 1 _____ 10 + 2 _____
   12 + 2 _____ only 12th complet _____
   Any other _____

7. Number of mathematics teachers with their qualification at each grade in the school.

Grade	Number of Maths teachers	Qualification
5	_____	_____
6	_____	_____
7	_____	_____
8	_____	_____

8. How many class rooms are there in this school? _____
9. What is the average number of students perclass? _____
10. How many desks are there in a class(on average)? ____
11. Does your schools have pedagogical center?
    Yes _____ No _____
12. Is there a liberary or reading room in your school?
    Yes _____ No _____
13. Is there a shortage of mathematics text book for grade 8 in your school? Yes _____ No _____
14. Does your school receive text books on time?
    Yes _____ No _____
15. If your answer to number 14 is "No" , what are the reasons for the delay?
    A. Transportation B. Shortage of budget
    C. Lack of responsible person
    D. Any other (specify): _____
    _____
16. What is the student/mathematics text book ratio for grade 8 in your school?
    A. 1:1
    B. 1:2
    C. 1:3
    D. 1:4
    E. 1:5
    F. More than 1:5
    G. None at all
17. What are the major problems you encountered (if any) in implementing the syllabus of grade 8 mathematics?
    A. Lack of experiance of mathematics teachers
    B. Shortage of mathematics teachers

C. Lack of necessary teaching material

D. Lack of trained mathematics teachers in relation to the new syllabus

E. Any other (specify). _____

_____

18. Have you ever visited mathematics teachers of grade 8 in their classroom?

A. Yes _____ B. No _____

19. If your answer to question 18 is "Yes" what are some of common instructional problems (if any) you observed in mathematics classrooms?_____

_____

_____

20. Have you ever discussed with mathematics teachers individually or on their department meeting with regard to the implementation issues of mathematics syllabus?

A. Yes _____ B. No _____

21. If your answer to question 20 is "Yes" what are common implementation issues usually raised by individual mathematics teacher or the department? _____

_____

_____

_____

22. Do you think that mathematics teachers of grade 8 in your school need more training to implement the syllabus effectively?

A. Yes _____ B. No _____

Please explain in brief why you think so ? _____

_____

_____

23. Are you introduced with the new curriculum through diffrent seminars or workshopes?

A. Yes _____ B. No _____

24. Do you think that your school is in a new change process as a result of the new curriculum?

A. Yes _____ B. No _____

Please explain in brief why you think so ? _____

_____

_____

_____

25. How do you rate the support provided by wereda education office to your school for implementing the new curriculum?
A. Adequate B. Inadequate C. Almost none existance

26. Please indicate by a tick (✓) how far the school provides the following school requirements for mathematics teachers?

School requirments for teachers	Adequatly	Not Adequatly	Not at all
Exercise books for preparing lesson plans			
Ball points/penciles			
paper for tests			
paper for notes and working mathematics for maths teachers			
Register forms for recording continuous test results			
Diffrent mathematical instruments for mathematics teachers			

27. Would you please enumerate some of the problems faced in your school regarding the implementation of grade 8 mathematics syllabus?

_____

_____

_____

_____

_____

_____

_____

APPENDIX D
TABE OF SPECIFICATION FOR GRADE 8 MATHEMATICS TEST

Ser No	Instructional Objectives Students will be able to:	Contents	Time used (Period)	Number of Test items
1	develop their capacity in working with variables. (Items No. 1-2)	• working with variables	4	2
		• properties of addition and multiplication of rational numbers	6%	6%
2	acquire skills for using rules of transformation of terms involving variables, that are derived from the rules of calculating rational numbers. (Items No. 3-8)	• Fundamental operations with variables: addition of sums, substruction of sums, multiplication of products,	13	6
		• division of products, taking out common factors, multiplication of sums by sums.	20%	20%
3	be familier with the notions relation and function. (Items No. 9-17)	• The concept of relation • Graphs of simple relation	19	9
		• The concept of function	29%	29%
4	know properties of linear functions and represent graphically. (Items No. 18-22)	• The cartesian coordinate system • Functions with equation y = mx • Functions with equation y = mx+b • Zero of a linear function.	12 18%	5 18%
5	Solve linear equations and related word problems. (Items No. 23-26)	• Solving linear equations	9	4
		• Solving word problems.	13.6%	13.6%
6	Calculate the square of Numbers. (Items No. 27-28)	• Squares of numbers	4	2
			6%	6%
7	extract rational squarroots and approxmate values of non rational squarroots with the help of numerical tables. (Items No. 29-30)	• Squarroots • Extracting squarroots	5	2
			7.5%	7.5%

N.B. The objectives are taken directly from the syllabus and the Teacher's Guide.

APPENDIX E

ADDIS ABABA UNIVERSITY

SCHOOL OF GRADUATE STUDIES

FACULITY OF EDUCATION

DEPARTMENT OF CURRICULUM AND INSTRUCTION

Mathematics Test for Grade 8

School Name: _____

Student's Name : _____ **Sex :**_____

Section : _____ **R.No.** _____

Instruction:- **Read each question carfully. For each question there is only one correct answer among the four alternatives given. Choose the correct answer and write the letter of your choice on the space provide for each question.**

_____1. If Y eggs can be bought for Birr 8, then what is the cost of X eggs when expressed interms of X and Y ?

A. $\frac{8x}{y}$ B. $\frac{8Y}{x}$ C. 8y - x D. 8y +x

_____ 2. If x,y,z are rational numbers, which one of the following is NOT true?

A. x+y = y+x B. (x+y)+z = x+ (y+z)

C. (x × y × z) = x × (y×z) D. x × (y+z) = xy + yz

_____ 3. What is the simplest form of the expression (3x + 9y) + (4x + (-2y)) - (x+y) ?

A. 6x+6y B. 6x -6y C. 6x + 8y D. 6x + 12y

_____4. Suppose your father is 2 years older than your mother, and the sum of their ages is 86, what is the age of your father ?

A. 42 years B. 44 years C. 84 years D. 88 years

_____5. Which one of the following products is NOT correct ?

A. $(3x)(2x^2)(3y) = 18x^2y$

B. $a^2 \times a^2 \times b^2 \times b^2 = a^4b^4$

C. $(10x)(2x^2)(\frac{1}{2}) = 10x^3$

D. $(-4rt) \times (-5r) = 20r^2t$

_____6. When $\frac{4x \times 4y}{2x \times 2y}$, (where $x,y \neq 0$) is simplified, it is equal to :

A. 4xy B. 4 C. 2xy D. 2

_____7. Multiplying x+1 by x-1 gives us :

A. $x^2 + 1$ B. x^2 C. $x^2 - 1$ D. $2x - 1$

_____8. Which one of the following is the factorized form of $9x^2 + 3x$?

A. $3x(x+3)$ B. $3x(x^2+1)$ C $3x(3x+1)$ D. $3x(3x+3)$

_____9. If P = { 1,2,3} and Q = { a,b,c}, then which one of the following is NOT a relation from P to Q ?

A. {(1,a),(2,b)} B. {(2,c),(3,a)} C. {(4,a), (5,b)} D.{(1,b),(1,c)}

_____10. Which one of the following statements is always true about a relation ?

A. A relation is any non empty set

B. A relation is a union of two sets

C. A relation is a set of ordered pairs

D. A relation cannot be formed unless there are atleast two distinct sets.

_____11. If R = {(-1,0), (-2,1),(-3,2),(-4,3)} then which one of the following is NOT true about R ?

A. The domain of R = {-1,-2,-3,-4}

B. $-1 \in R$

C. The range of R = {0,1,2,3}

D. R has four elements

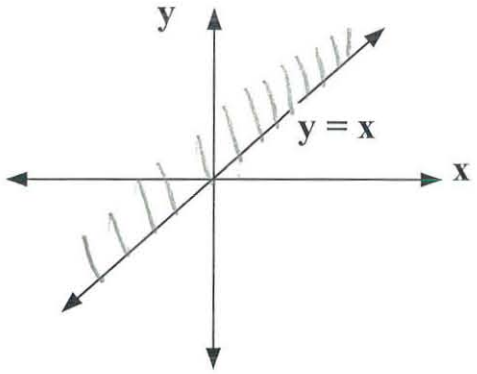
_____12. which one of the following relations describes the graph given below?

A. $\{(x,y) : x > y\}$

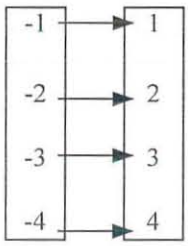
B. $\{(x,y) : x < y\}$

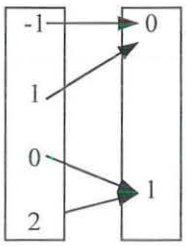
C. $\{(x,y) : x \geq y\}$

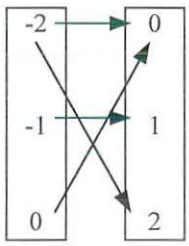
D. $\{(x,y) : x \leq y\}$



_____13. One of the following mappings doesnot represent a function.

A 

B 

C 

_____14 which one of the following relations is a function ?

A. R = $\{(3,2),(4,2),(5,2)\}$

B. R= $\{(4,2),(4,3),(2,3)\}$

C. R= $\{(3,-1),(4,-1),(3,2)\}$

D. R= $\{(0,0),(2,10),(-1,3),(0,5)\}$

_____15. Which of the following ordered pairs belongs to the relation defined by the formula $2x + 3y < 3$?

A. (2,0) B. (1,1) C. (4,-5) D. (-4,5)

_____16. Let (x,y) be the elements of a certain function F as indicated on the table given below, then which one of the following relations define F ?

A. $\{(x,y) : y = 2x\}$

B. $\{(x,y) : y = 2x+2\}$

C. $\{(x,y) : y = 2x+1\}$

D. $\{(x,y) : y= 2x-2\}$

X	2	10	8	0	-6
Y	2	18	14	-2	-14

_____17. If a function is defined by the formula f(x) = x+1, then which one of the following is NOT correct ?

A. f(0) = 1 B. f(-1) = 2 C. f(2) = 3 D. f(3) = 4

_____18. In which quadrant does the point (-1,-1) lies ?

A. 1st quadrant B. 2nd quadrant C. 3rd quadrant

D. 4th quadrant

_____19. One of the graphs of the following linear functions does not pass through the origin.

A. $y = 3x+3$ B. $2y-2x = 0$ C. $y-2x = 0$

D. $y = mx$, ($m \in Q$, and $m \neq o$)

_____20. If an equation of a straight line is given as:

$y=4x+3$, then which one of the following is NOT true?

A. Its slope is 4 B. Its y-intercept is 3

C. It passes through the point (0,0)

D. Its x-intercept is $-3/4$

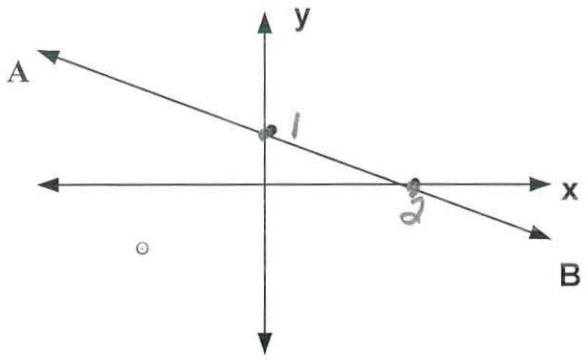
_____21. The equation of the line $\overleftrightarrow{AB}$, in the figure below is :

A. $y = x + 1$

B. $y = \frac{-x}{2} + 1$

C. $y = -2x + 2$

D. $2x - y = 0$



_____22. The zero of the function defined by the formula;

$y = 3x-2$ is ;

A. -2 B. $\frac{2}{3}$ C. $\frac{-2}{3}$ D. 2

_____23. What is the solution of the equation $2(x-3) = 5x-11$?

A. $\frac{3}{5}$ B. $2\frac{3}{7}$ C. $2\frac{2}{3}$ D. $1\frac{2}{3}$

_____24. If $\frac{3}{x+1} = \frac{5}{2x}$, what is the value of x ?

A. 5 B. $\frac{1}{11}$ C. $\frac{7}{11}$ D. $\frac{5}{11}$

_____25. The larger of two numbers is twice the smaller. If the sum of the numbers is 120, what are the numbers ?

A. 20 and 40 B. 30 and 60

C. 10 and 20 D. 40 and 80

_____26. Alemitu has bought 20 books. Some of them cost Birr 8 each and the remaining Birr 3 each. If Alemitu has paid Birr 110 totally, then what is the number of books which cost Birr 3 each ?

A. 8 B. 5 C. 10 D. 3

_____27. Which one of the following is not correct ?

A. If $x < 0$, then $x^2 < 0$

B. If $x+1 < 0$, then $(x+1)^2 > 0$

C. $(-3)^2 + (-4)^2 = (5)^2$

D. For any natural number n, there exist a natural number m, such that $n^2 = m$

_____28. Which one of the following is not a square of a natural number?

A. 81 B. 5 C. 144 D. 16

_____29. What is the simplest form of $\sqrt{7\frac{1}{9}}$?

A. $3\frac{1}{3}$ B. $\frac{3}{8}$ C. $\frac{8}{9}$ D. $2\frac{2}{3}$

_____30. If $\sqrt{2} = 1.4$ and $\sqrt{3} = 1.7$, then $\sqrt{8} + \sqrt{12}$ is equal to :

A. 2.11 B. 3.1 C. 6.2 D. 4.22

APPENDIX F
Class Room Observation

A. Rating Form:

Name of the school _____

Zone _____ Wereda _____

Grade and Section _____

Date of Observation _____

Period _____ Time: From _____ To _____

Lesson Topic _____

Ser No	Instructional Considerations	Frequency		
		Frequently	Rarely	Not at all
1	How often the teacher explain procedures step by step with students practice after each step?			
2	How often the teacher use demonstration in the instructional process?			
3	How often the teacher ask questions, check for student's understanding, and obtain responses from all student?			
4	To what extent the teacher write note on the black-board?			
5	To what extent do students actively participated in class activity?			
6	How often is the instructional activity more of a discussion type?			
7	How often the teacher guide students to observe patterns and discover rules and generalizations by them selves?			
8	How often does the teacher change activities in his teaching(i.e)From talking to listening and then to writing) in order to keep the students attentive?			
9	How often does the teacher attempt to relate day-to-day(contemporary) affairs to the lesson?			
10	How often the teacher take the individual difference into consideration and assist his students?			

B. Check List

Ser No	Selected implementation variables	Yes	No
1	Did the teacher begin a lesson with statement of goals?		
2	Did the teacher check homework?		
3	Dis the teacher summarize previous day's materials?		
4	Did the teacher use the text book in the classroom as a resource material?		
5	Dis the teacher use instructional materials in the classroom?		
6	Did the teacher conduct class work?		
7	Was the teacher available to provide immediate help to students during class work?		
8	Did the teacher let students to work some exercises and problems on the black board?		
9	Did the teacher divide the class into groups and encourage students to work in-group?		
10	Did the teacher give homework assignments?		
11	Did the teacher end lesson with review or summary?		
12	Was there any misunderstanding of some content element by the teacher?		

APPENDIX G

CALCULATION OF THE CHI-SQUAR(X^2) STATISTICS

Attitude Scores of Teachers by School Type (out of 70)

Urban	Rural
45	56
44	52
41	45
41	45
41	44
40	43
40	41
39	33
37	32
32	
28	

Combination of the Scores of the Two Groups of Teachers to obtain the Grand Median

56, 52, 45, 45, 45, 44, 44, 43, 41, 41, 41, 41, 40, 40, 39, 37, 33, 32, 32, 28

$$\text{Grand Median} = \frac{41+41}{2} = 41$$

1. Calculation of The x^2 median Test statistics for Data in Table 2

The formula is, $$x^2 = \frac{N\,[\,|AD-BC| - \frac{N}{2}\,]^2}{(A+B)\,(C+D)\,(A+C)\,(B+D)}$$

A = 2 , B = 6 , C = 6 , D = 3 ,

A+B = 8, C+D = 12 , A+C = 11 , B+D = 9 ,

and N = A + B + C + D = 20

$$x^2 = \frac{20\,[|6-54| - 10]^2}{8 \times 12 \times 11 \times 9}$$

$$= \frac{20 \times [|-48| - 10]^2}{9504}$$

$$= \frac{28880}{9504}$$

$$= 3.038$$

2. Calculation of The Chi-Squar statistics for the Data in Table 15

The formula is , $x^2 = \sum \frac{(f_0 - f_e)^2}{f_e}$

Objective 1

Cell	f_0	f_e	$(f_0 - f_e)^2$	$(f_0 - f_e)^2 / f_e$
1	22	20.75	1.56	0.075
2	25	20.75	18.06	0.870
3	24	20.75	10.56	0.508
4	12	20.75	76.56	3.689
5	88	89.25	1.56	0.017
6	85	89.25	18.06	0.202
7	86	89.25	10.56	0.118
8	98	89.25	76.56	0.857

$x^2 = 6.336$

Objective 2

Cell	f_0	f_e	$(f_0 - f_e)^2$	$(f_0 - f_e)^2 / f_e$
1	50	29.25	430.56	14.720
2	31	29.25	3.06	0.104
3	17	29.25	150.06	5.130
4	19	29.25	105.06	3.591
5	60	80.75	430.56	5.332
6	79	80.75	3.06	0.037
7	93	80.75	150.06	1.858
8	91	80.75	105.06	1.301

$x^2 = 32.073$

Objective 3

Cell	f_0	f_e	$(f_0 - f_e)^2$	$(f_0 - f_e)^2 / f_e$
1	69	49.5	380.25	7.681
2	50	49.5	0.25	0.005
3	37	49.5	156.25	3.156
4	42	49.5	56.25	1.136
5	41	60.5	380.25	6.285
6	60	60.5	0.52	0.004
7	73	60.5	156.25	2.582
8	68	60.5	56.25	0.929

$x^2 = 21.778$

Objective 4

Cell	f_0	f_e	$(f_0 - f_e)^2$	$(f_0 - f_e)^2 / f_e$
1	56	44.5	132.25	2.971
2	43	44.5	2.25	0.050
3	43	44.5	2.25	0.050
4	36	44.5	72.25	1.623
5	54	65.5	132.25	2.019
6	67	65.5	2.25	0.034
7	68	65.5	6.25	0.095
8	74	65.5	72.25	1.103

$x^2 = 7.945$

Objective 5

Cell	f_0	f_e	$(f_0 - f_e)^2$	$(f_0 - f_e)^2 / f_e$
1	78	69.25	76.56	1.105
2	65	69.25	18.06	0.260
3	67	69.25	5.06	0.073
4	67	69.25	5.06	0.073
5	32	40.75	76.56	1.878
6	45	40.75	18.06	0.443
7	43	40.75	5.06	0.124
8	43	40.75	5.06	0.124

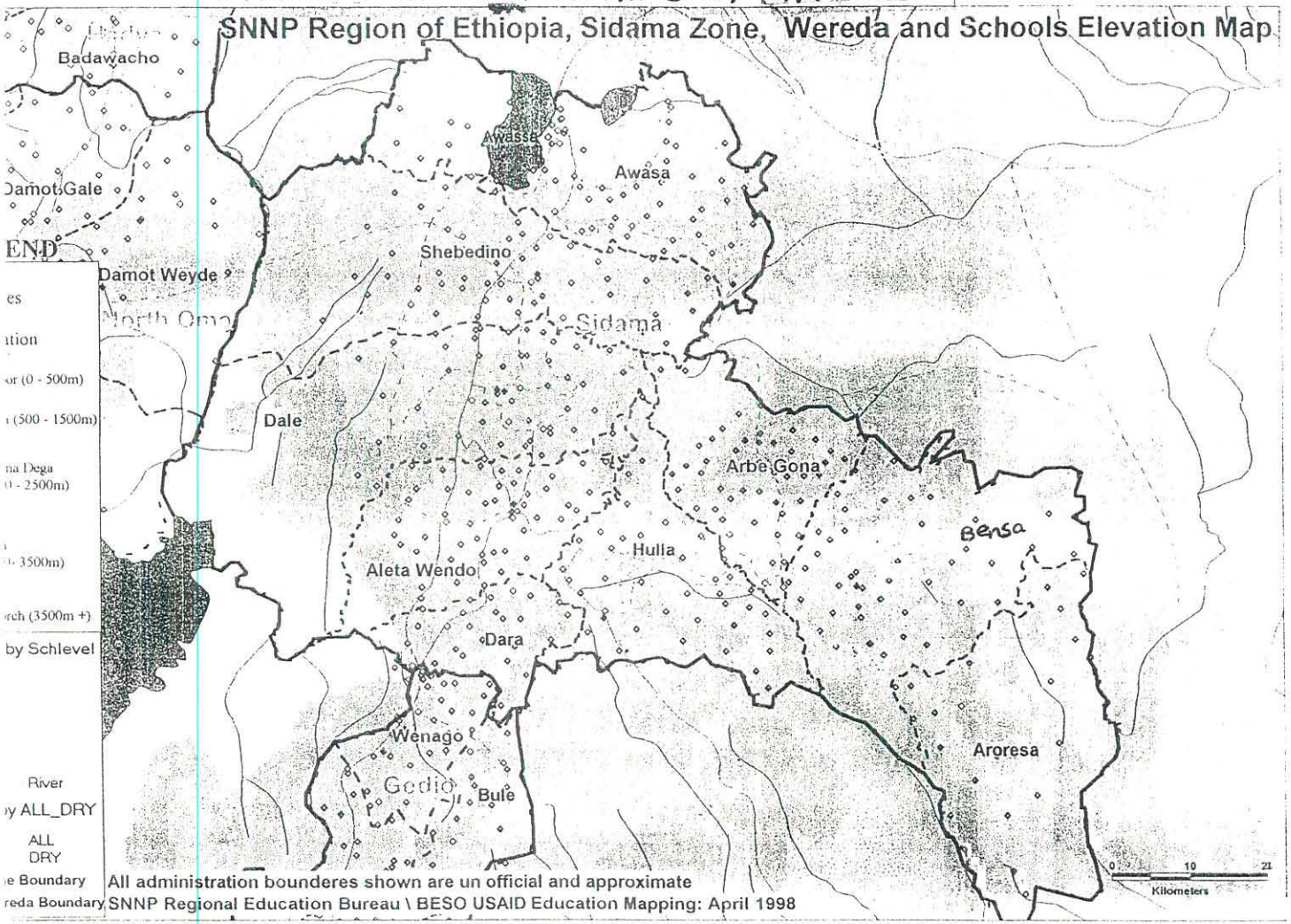
$x^2 = 4.08$

Objective 6

Cell	f_0	f_e	$(f_0 - f_e)^2$	$(f_0 - f_e)^2 / f_e$
1	95	86.5	72.25	0.835
2	85	86.5	2.25	0.026
3	85	86.5	2.25	0.026
4	81	86.5	30.25	0.349
5	15	23.5	72.25	3.074
6	25	23.5	2.25	0.095
7	25	23.5	2.25	0.095
8	29	23.5	30.25	1.287

$x^2 = 5.787$

APPENDIX H - MAP OF THE STUDY AREA



DECLARATION

I, the undersigned, declare that this thesis is my original work done under the guidance of Dr. Marew Zewdie. All relevant sources used for the thesis are duly acknowledged.

Name Solomon Areaya

Signature 

Date June 27, 2020