

# **Chapter - I**

## **INTRODUCTION**

### **Background of the Study**

Mathematics is important and useful in human's life. It has a long history from antiquity and has been developing with different civilization. Mathematics has played an important role in building and perfecting all sciences in this world of today. It is also said that if any body wants to make success in her/his life, s/he must recourse the mathematics. Mathematics develops power of acquiring knowledge, thinking and generalization. It is one of the main subjects taught all over the world in school education which is considered as essential part of all citizen.

As part of school reform, the Government has launched a number of initiatives and interventions. The reform, in a nutshell, includes improving the physical learning atmosphere of the schools through classroom construction and provision. The school have furniture, toilets and drinking water, pre-school education and early childhood development programs, increasing access to education of girls and children belonging to ethnic and linguistic minorities, dalits. Those people coming form difficult circumferences through targeted scholarship, providing education through the means of alternative schooling to those who can not be served through formal schools. Developing, revising and improving the quality of curriculum materials; introducing a continuous and/or formative assessment system; providing for teacher support and supervision through education and training centres; upgrading teachers' professional qualifications through certification and recurrent training courses, developing teacher support materials, upgrading the capacity of head teachers to lead, manage and support educational change at the school level.

These achievements are important, many argue that the outcomes of the schooling must not measured in terms of the availability of resources alone. It is being increasingly recognized that the outcomes of schooling need to be assessed in terms of student learning. As some say, 'reform must focus on learning acquisition and outcomes, rather than merely on enrolment' (Kellaghan and Greaney, 2004: P. 2). The bottom line, therefore, is whether children have learned or achieved what they were supposed to learn or achieve. While it is important that schools have good physical

facilities, trained teachers, adequate fund, good libraries, good text book and good learning materials, their availability does not automatically lead to student achievement. Many, therefore, emphasize that a 'good' school must be judged based on its output rather than the input. The output oriented educational policy is a recent phenomenon, which emerged in the 1990s.

The growing recognition that schooling should produce learning achievement on the part of students has suddenly increased public interest in examinations and assessments as the key instrument of measuring learning achievement. Policy-makers, from both developed and developing countries, are calling for increased use of examination and assessment to acquire information about what students have learned as a result of teaching learning in schools. It is believed that the information generated from assessments and examination serves in number of ways. Kellaghan (2004) argues that such information is useful in making educational decisions about students; giving feedback to students about their progress, their strengths and weakness, motivating students for further learning, judging instructional effectiveness and curricular adequacy. In recent years, worldwide interest in assessment and examination has moreover, resulted in the use of three different types of procedures in assessing and examining students achievement: a) Public examination (b) National assessments (c) International assessment of educational achievement (Kellaghan 2004).

The School Leaving Certificate (SLC) examination instituted as early as 1934 when the concept of modern schooling had not begun yet, are designed to assess the learning achievement level of grade 10 students, the terminal grade of the school education. The SLC examinations are administered centrally by the office of the controller of examinations (OCE), a constituent organization within the office of the ministry of education (MOES). The purpose of assessing the learning achievement of students at the end of ten years of schooling is mainly twofold: Certification of school achievement of students and selection of students for higher education.

The purpose of the SLC examination is to test the learning achievement of Grade X students, which is the terminal grade of secondary education. These examinations take place annually. The SLC examination is conducted in eight subjects, six of which are compulsory subjects including mathematics of 100 full

marks. The two other subjects are optional subjects. The SLC is a group certificate, meaning that to be able to obtain SLC one must pass all eight subjects. As mentioned earlier, students' performance in each subject is marked out of 100.

Mathematics is a significant subject in human life but most of the students failed in mathematics in SLC examination. The failure rate of students in mathematics is higher as compared with other subjects. It was also found that (most of the ineffective secondary schools) failure in SLC examination was due to the failure in mathematics. Therefore, the question ahead of all us is why do most of the students fail in mathematics in ineffective schools? For several years, this question was dismissed because 'failure' was take to be a natural phenomenon.

**Table No. 1**

**District Achievement of Regular Student in Mathematics in SLC in Last Five Years of Dailekh District**

Year	No. of student attained in examination	No. of passed student	Passed percentage
2065	3900	2663	68.00
2066	4630	2206	47.65
2067	4397	1516	34.48
2068	4561	2146	47.05
2069	4913	541	11.01

Source : DEO Dailekh, 2013.

**Statement of the Problem**

SLC result has become the most influencing indicator in determining the effectiveness of schools. However, most of the ineffective schools have the poor results in SLC examination due to the mathematics failed students. It has become the common concern among the people that high failure rate in mathematics has become a cause of failure in SLC examination. What factors causes on failure of students in mathematics in SLC Examination are determined but they are not sufficient. So in this context the main purpose of this study was to investigate the causes of failure in

mathematics in ineffective schools of Dailekh district. The research was conducted to answer the following specific questions.

- ) What are the causes of failure in mathematics in SLC examination in an ineffective secondary school of Dailekh district?

### **Rational of the Study**

As stated in the background most of the students in ineffective secondary schools are being failed in mathematics in SLC examination, especially. In one hand it was necessary to introduce new concepts in mathematics which is being developed day by day with its new ideas. On the other hand there are still low qualified and under qualified teachers teaching mathematics. It means there is still lack of trained subject teacher in remote area of the country. Besides it, this study would help to find the different factors (cause) that affect students to be failed in mathematics in SLC examination. This study tried to explore the attitude of failure students toward the present mathematics contents and suggested for improving some main cause which has increased failure rate. Also pointed out the relation between causing variable and mathematic performance, upgrading system which could be important value of examination and teacher in Dailekh district. It also helped to the researcher to seek further study.

### **Objectives of the Study**

This study was intend to achieve the following objectives:

- i) To identify the causes of failure in mathematics in SLC examination from ineffective secondary school of Dailekh District.
- ii) To find out the effect of causing variable on low performance of students in ineffective school of Dailekh district.

### **Delimitation of the Study**

The study was confine to a single ineffective secondary school of Dailekh district. The case school was select in accordance with researcher's convenience. So the result of the study could not be more generalized due to the constrained of time, the resources and study capabilities. Interview, class observation form, and school

documents only was use as tools. The study focused only the ineffective schools of Dailekh district and this study was conduct to SLC failed students in Mathematics.

### **Definition of the Terms**

**Ineffective school:** The school whose school efficiency measures (SEM) that utilized the following criteria

- ) No of student appearing in the SCL examinations.
- ) Pass percentage.
- ) Percentage of students passing in the first, second and third division.

Those with the lowest SEM as treated as ineffective school.

**Effective School :** The school whose school efficiency measures (SEM) that utilized the following criteria

- ) No of student appearing in the SCL examinations.
- ) Pass percentage.
- ) Percentage of students passing in the first, second and third division.

Those with the highest SEM as treated as effective school.

**SLC Examination :** The school leaving certification examination that is for the evaluation at the end of secondary level.

**Failure Students :** The students in this study refer to those boys and girls who are not able to secure minimum pass mark.

## **Chapter - II**

### **REVIEW OF RELATED LITE RATURE**

The related study provides the researcher in making his problem more realistic, precise, researchable and meaningful. In order to get a better understanding of the subject of one's study it is essential and helpful to survey the literature and study relevant and related to it. Bearing these advantages in mind, the researcher reviewed several studies. Some studies related to cause of failure in mathematics is reviewed for this study.

#### **Empirical Literature**

Regmi (2007) did a study on a topic "A Study of causes of failure in optional mathematics in S.L.C. examination the main finding of this study as follow which were the cause of being failure. Text books were more theoretical, lack of teaching materials in teaching activities, teaching without familial with student's previous knowledge.

Subedi, (2005) studied on 'Factors Affecting failure in Mathematics in SLC Examination' the major finding of the study were: (i) School environment has strongly positive effect on the mathematics achievement (ii) Effective class room teaching and time variable have a mid-positive effect on the mathematic achievement. (iii) Physical facilities and interest of learner has a low positive effect in mathematic achievement.

Leung (2002) Department of Mathematics, Hong Kong institute of Education) conducted a study entitled "Structural Equation Modeling of Affects and learning Approach in Mathematics Education". The following were the eight variables. Which are affect the learning mathematics 1) Mathematics and mathematics teaching beliefs 2) Mathematics self-concept. 3) Mathematics and mathematics teaching attitude. 4) Mathematics teaching self-efficiency. 5) Surface learning approach. 6) Deep learning approach. 7) Achieving learning approach. 8) Mathematics and mathematics education achievement.

Pandey (2007) conducted a case study of ineffective secondary school of Kailali district in about 'Factors are influencing Mathematics Achievement' with the

objectives to find the current mathematics achievement, the influencing factors of low mathematics achievement in ineffective secondary schools of Kailali districts. Some findings based on personal factors are: Girls had to be involved in household work which had resulted to be poor in mathematics because they had less time for their mathematics homework, Motivation plays important role in student's mathematics achievement, Prior knowledge and present achievement are strongly co-related, The more students study and labour hard at home the more success is seen in mathematics learning,

Some findings based on environmental factors are:

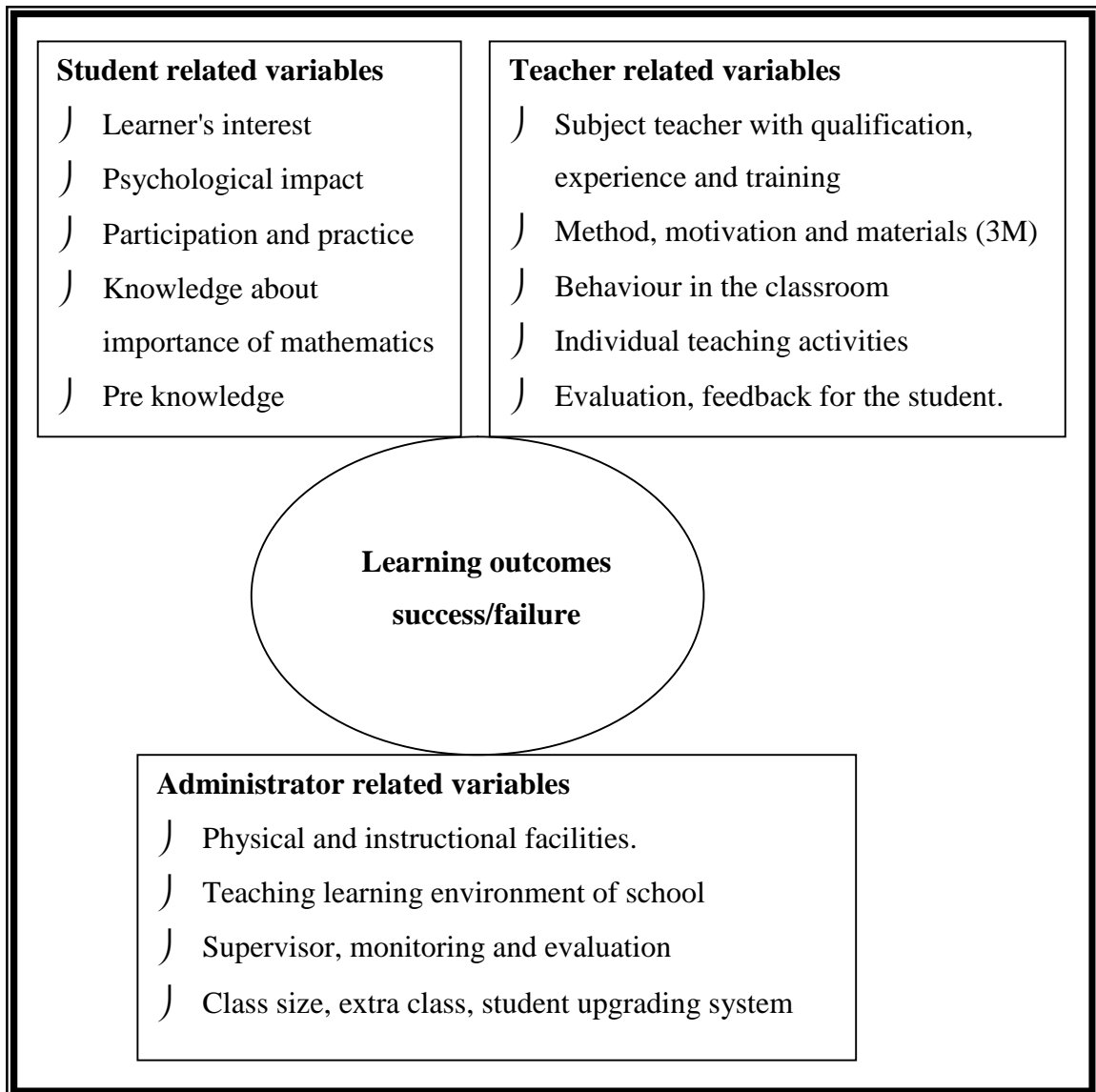
- ) Teachers activities, emphasis on extra mathematical contest, IQ test had positive result for the student.
- ) Laziness of teacher and their lack of knowledge on student's psychological understanding have given poor result to the students.
- ) There was no lesson planning of mathematics teachers daily and use of teaching materials in class room was rare.
- ) Student centered teaching-training activity was neglected because the teacher's lacked those kinds of experiences.

Neupane (1985) studied on "Achievement in Mathematics by location and sex: A study of the Achievement of Eight grade students in Mathematics in selected schools of Kaski district." He concluded that students studying in urban schools achieved better in mathematics than the students in rural school in each of the four levels of cognitive domain and boys achieved better than girls in mathematics the four levels of cognitive domain.

Tharu (2014) did a student's "Causes of failure in mathematics in S.L.C. examination the main finding of this study were (i) student's and teacher both agreed that teacher's qualification affected to poor academic performance. (ii) Teachers and Students both agreed that method of teaching and learning materials were most important part in teaching leaning field for teacher's. Also teachers and student's claimed that large number of students in class room many teachers were not innovative in methodology.

## Proposed Model of the Study

For the study of cause of failure in mathematics ineffective school, the researcher took only three variables related to the students teacher and school administrator which are shown in the following model.



Source : Neupane 1985 : Achievement in mathematics by location and sex.

## Theoretical Literature

### Theory of Intelligence

Intelligence has long been considered as an important component of educational achievement or success. For the last several decades, the psychologists have been emphasizing that it is one's intelligence that makes a difference in schools,



meaning that people are born with unequal intelligences and those who have more intelligence are able to learn in comparison to those who have less intelligence. To believe that some people are born smarter than others implies that nothing can be done to improve one's learning because it is pre-determined. For decades, the intelligence theory led to believe that good students stay good but the bad ones stay bad throughout their lives. Jensen (1972) argued that lower class children, especially blacks in the US, suffer from a specific cognitive deficit, an inability to engage in conceptual learning, and this inability is a result of genetic inheritance. For Jensen, genetic differences in intelligence explain unequal educational performance in schools by different groups of children. Jensen's work was later challenged by Ginsberg (1982), who demonstrated that children, black or white, possess fundamental competencies in mathematical thinking and that there is no evidence of pervasive cognitive deficit.

### **Theory of Educational Productivity**

Walberg (1981) proposed a theory of educational productivity which has as its theoretical foundation. Lounsbury's (1963) formulation of behaviour as a function of personality and environment. Walberg's theory requires optimization of nine factors to increase students' achievement of cognitive and affective outcomes (Walberg, Fraser and Welch, 1986). The nine productive factors are: (the student's variables). (a) ability or prior achievement (b) age (c) motivation or self concept: (The instructional variables) (d) quality of instruction (e) quality of instructional experience, and educationally stimulating psychological aspects of the (f) home environment (g) the class room or school environment (h) the peer group environment (i) the mass media (especially television). These factors were classified into three general groups by Wilkins et. al. (2002): (a) personal variables, such as prior achievement, age, motivation or self concept; (b) instructional variable such as amount or quality of instruction, and (c) environmental variables related to the home, teacher/classroom, peers and media exposure.

### **Theory of Fear**

Holt (1964) in his book *How Children Fail* postulated that children fail because of fear in schools. The boredom, confusion, fear, limitless hopes, and expectations of

adults all contribute to failure. Fear is one tactic or strategy that schools and teachers have used for along time to control, discipline, and motivate teachers. Fear destroys intelligence and affects a child's whole way of looking at, thinking about, and dealing with life. A fearful mind cannot learn. Fear and failure are very closely linked. Schooling is about fears, and throughout their schooling children one taught to be afraid of failure. The fear of failure and subsequent experience of humiliation, insult, punishment and schooling prompts children to refrain from working hard.

### **Theory of School Effectiveness**

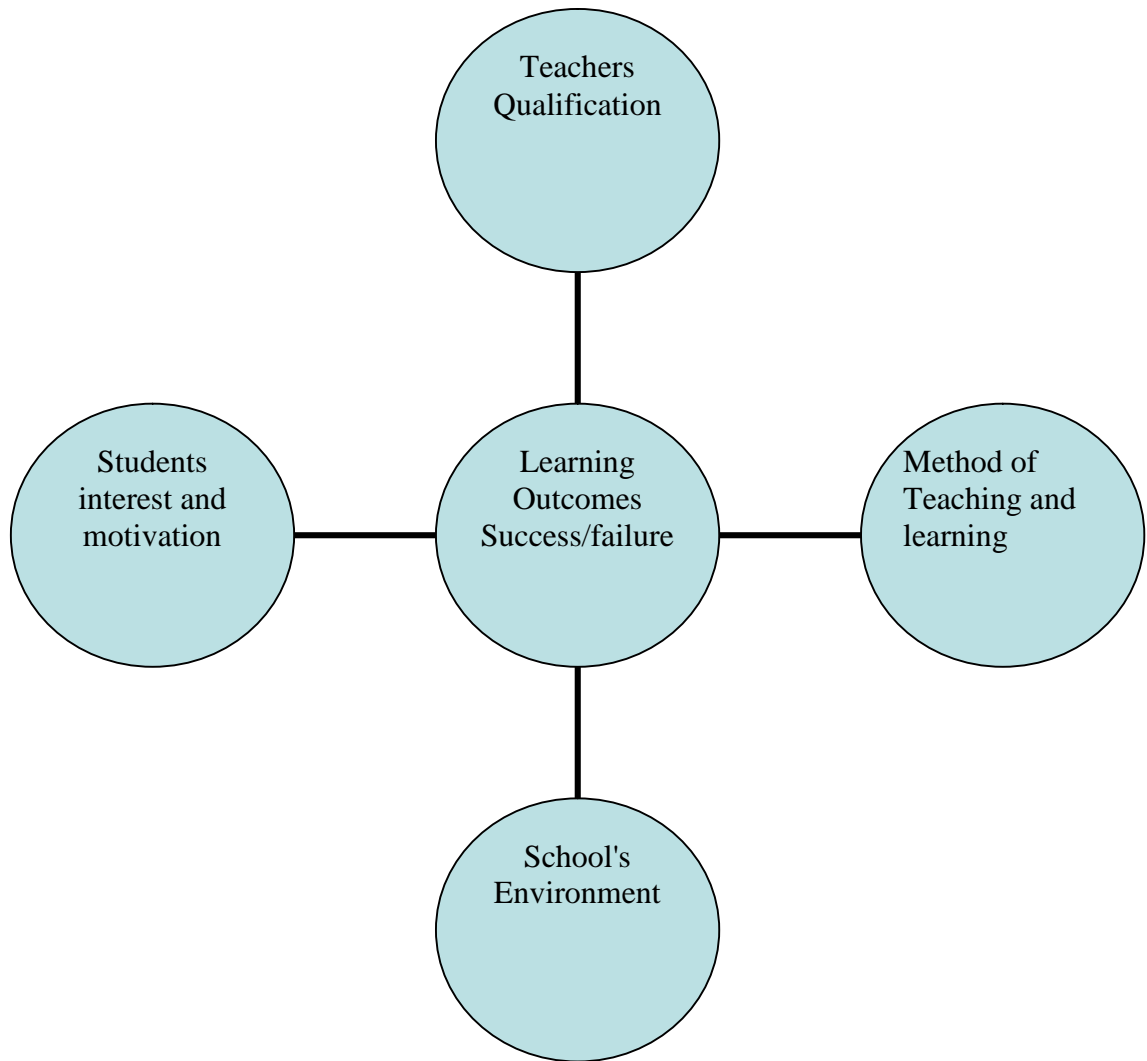
Edmonds (1979) provided an alternative interpretation of the interaction between student performance and family background. Now popularly known as the school effectiveness research, asserts that variability in the distribution of achievement of school age children drives from variability in the nature of school to which children go school achievement is there fore relatively independent of family background, at least when achievement is defined as acquisition of basic skills. An effective school is defined to be one where the proportion of low-income children demonstrating good performance is identical to the proportion of middle - class children who do so.

### **Carroll's Model of School Learning**

Corroll's model of school learning involves five factors three of these factors are related to the learner : (i) aptitude the amount of time required to learning the task under optimal instructional conditions. (ii) Ability to understand instruction and (iii) perseverence the amount of time the learner activity engaged in learning. The learner activity engaged in learning. The reaming two are external to the learner. (iv) Opportunity for learning and (v) the quality of instruction.

### **Conceptual Understanding**

For the study of causes of failure in mathematics in SLC examination in an ineffective school, the researcher took different variable like teachers qualification, method of teaching and learning materials, school's environment and students and motivation which are shown in the following model.



In short, there is theoretical understanding and empirical evidence that various causes have affected in students' failure. Basically the study has not included the failure student in an ineffective school yet, so this study was conducted in ineffective school and it was done to determine the causes of failure in mathematics in SLC examination.

These above theories helped the researcher to research about this topic. These theories clearly guided to the researcher. After studying these theories he prepared tools and interview guidelines. The main aim of the researcher was to find out the causes of failure in mathematics in S.L.C. examination in an ineffective school were reflecting in these theories. These variables play vital role for students to fail or pass. Therefore the researcher wanted to review of these theories.

The theory of intelligence guided the researcher to find out the causes of failure due to genetic endowment, differences in home environment and parental childrearing practices and cultural differences. The theory fear guided the researcher to find out the cause of failure by teaching learning methodology, instructional materials, lesson plan are the causes of failure.

The theory of educational productivity guided the re3seracher to find out the causes of failure due to teacher's qualification on lack of quality of teacher inadequate knowledge of subject matter effects poor academic performance similarly.

School environment such as students' negative attitude poor school environment education of parents per groups are closely reacted with theory of school effeteness which is guided the research.

## **Chapter - III**

### **METHODS AND PROCEDURES**

Research methodology is a science, which determines how the research becomes complete and systematic. It does not only mean to collect data information but also mean to use appropriate research method. As methodology is the root of research, the researcher should be clear about the research design, nature and source of data, selection of the case school and selection of respondents, instruments/tools, data collection procedures and data analysis and interpretation. So these mentioned points are included in this chapter.

#### **Research Design**

Research design is a way and path of the research that guides the researcher to reach the goal of research and find out the statement of the problem. Research framework is derived research design. This is a case study of the causes of failure in mathematics in SLC examination of ineffective secondary school. This research is descriptive and qualitative in nature.

#### **Nature and Source of Data**

Mainly, the research was based on primary data. However, both primary and secondary data were collected. The researcher himself visited the case school and collected data. Secondary data were collected from published and unpublished literature, school records, and government records. The researcher has used qualitative and quantitative data.

#### **Selection of Case School**

Most of the secondary schools situated in remote area of Nepal have no good performance in SLC examination. These schools in this research are considered as ineffective schools. Other schools whose performances in SLC examination are better are considered as effective schools. The researcher has selected the case school from Dailekh district, which is considered as an infective school. The case school was taken on the basis of school performance in SLC examination (Reg) of last five years in mathematics. There are ninety-five secondary schools in this district, among them

case schools were select Shree Devi Higher secondary school Malika which lies Milika Resource Canter (RC) selected by perposive sampling methods which are situated in remote area of Dailekh district. The school performance in SLC examination (Regular) from 2065 B.S to 2069 (five year) in mathematics of the school are presented below.

**Table 2**  
**School Performance in SLC Examination in Mathematics of the Case School (Ineffective)**

S.N	Years (B.S)	Performance in Mathematics of Ineffective school (mean)	National average pass percentage
1.	2065	19.2	68.47
2.	2066	16.8	64.31
3.	2067	25.5	53.5
4.	2068	23.1	49.2
5.	2069	28.35	52.3

Source : DEO Dailekh, 2013.

### **Selection of Respondents**

Students, mathematics teacher and head teacher were the respondents of this case study. Only ten failure students from ineffective school was select as sample of this study according to gender and previous academic background. Among the 25 exempted candidates 10 students (40%) was select for sample by using systematic random sampling method.

### **Instruments/Tools**

To collect primary and secondary data for this case study the interview, class observation form, and school documents were the instruments of the study. These instruments were used to collect primary and secondary data. The tools were develop depending upon the different variables/causes of the purposed model of this study. For the validation of the tools, pilot study was carried out.

## **Interview**

The interview with the respondents were take in the basis of related points (Appendix-A, B and C) for collecting the information's as students related variable, teacher related variables and school administrator (H.M) related variables.

## **Observation**

The direct observation methods were use to collect the information about teacher activities in his class school environment, class room situation, student activities. (Appendix D and E)

## **School Documents**

The informations related to the students who failed in SLC examination and his/her regularities, previous academic condition, SLC result and teacher's profile was collect from school documents.

## **Data Collection Procedure**

The researcher collected needed data and information by using interview, class observation. The researcher participated in the classroom observation to collect qualitative data. On the basis of observation form, the researcher observed mathematics class of grade X and recorded the activities (behaviour) in the classroom in his observation form. The interviews were taken with the failure students, teacher and head teacher separately. Answers of the interviews were record. The interview was focus on the variables like interest toward subject, regularity and practice, pre knowledge, method, materials and motivation (3M), behaviour in class room, teaching- learning environment of the school.

School documents related to the study of the school, teacher's profile physical facilities, student and teachers regularity, previous result of failure students, SLC result was acquired from school for the purpose of collecting data.

## **Data Analysis and Interpretation**

The recorded interview was transcribed and the information gained from class room observation, documents were categorized according to different causes in failure

in mathematics and the different themes were give in the text of the interview, and the observation. These themes were considered as a code. The data were analyze and interpreted on the basis of different theories and by using proposed model of students learning.

The researcher took interview to analyze the causes of student's failure in mathematics. He point out in Nepali during interview for easier and then he translated in English. He obtained many views on the same topic. The researcher analyzed and interpreted the data of interview on the basis of that factors which were responsible to perform poor academic performance. He concluded that the factors which were in the interview of the respondents.



## **Chapter - IV**

### **ANALYSIS AND INTERPRETATION**

This chapter deals with the analysis and interpretation of the collected data from the case school. The data and information acquired from school administration, students teachers with help of interview, class room observation, were analyzed and interpreted for the cause and effect. Collected data were categorized, tabulated and analyzed on the basis of causes of failure in SLC examination. Here a short profile of case school is given as a reference of analysis.

#### **Short Profile of Case School**

Shree Devi higher secondary school of Dailekh district established in 2014 B.S. with help of local people and their community. This school is located in western part of Dailekh district. This is one of the school situated in remote area of Dailekh district.

Devi higher secondary school is a government aided school. Though it is not full fledged community school. Many teachers are kept in school's own source. Some of them are government aided. In the beginning some people of that place realized the need of school to impart education to all children, stepped towards establishing school. First of all they built a temporary cottage and started teaching children. The school was registered as primary school in 2014 B.S. In 2034 B.S., the school was registered as lower secondary school and become secondary in 2047 B.S. The first batch appeared in SLC examination from 2047 B.S. The school was registered in higher secondary school in 2063 B.S.

The researcher visited the case school for collection of data and collected both primary and secondary data using all prepared research tools. Data were analyzed from many perspectives such as learner's interest, psychological impact in students, prior knowledge, study at home, students knowledge about importance of mathematics, subject teacher with qualification and experience, method, materials and motivation, teachers behaviour in the class room, individual teaching activities regularity and responsibility, evaluation and feedback, physical and instructional facilities, teaching learning environment of school, supervision monitoring and

evaluation, class size, extra class, student upgrading system. The data and information were categorized, analyzed and interpreted under the following headings:

Analysis based on students related variable.

Analysis based on teacher related variable.

Analysis based on administrator related variable.

### **Student Related Variables as a Caused of Failure in Mathematics**

Mathematics education has become a challenging issue for all the teachers, students, parents and even for the experts. The newly developed teaching techniques and learning styles makes more challenging. Not only that, many variables/factors causes failure of students. Learner's interest, psychological impact in student, regularity in the class, peer discussion, prior knowledge, (practice) study at home, knowledge about importance of mathematics have been taken as student related variables and each of them have been analyzed.

#### **Learner's Interest to Subject Matter**

S.L.C failed students are the key respondent of this research. As the researcher have taken interview about how much do they like to read and write mathematics. The sample responses were.

*"I sometimes to read and write mathematics, there are many questions, different from one another in almost the exercises. I never passed mathematics in former grades. So I failed in SLC due to mathematics."*

*(Failure girl student)*

*"I never tried about the depth study of mathematics because it is not compulsory for higher education. I think to leave mathematics in higher class if I just - passed in SLC" (It is from cheating/or copying).*

*(Failure boy student)*

*The questions practiced in the classroom were not asked in the examination. The method of learning is only rote learning.*

*(Failure boy student)*

These views expressed by the students indicated that they failed due to the lack of their interest in subject matter. Both boys and girls did not pay attention from the beginning of class.

### **Prior Knowledge**

The basic knowledge or prior knowledge of former grade is the key factors to affect the present grade. Prior knowledge base is also important potential determinant of performance.

In order to find out some possible reasons for the failure in mathematics the information from interviews was used. The sample response were:

*“I was very weak in mathematics from earlier grades. I have still problem in learning mathematics. So I always fail in mathematics,”*

*(Student of infective school)*

*“I often have problem in basic rules and methods of even simplify or other mathematical calculations.”*

*(Boy student)*

These views indicated that there is a poor situation of prior knowledge and interrelation between past knowledge and present achievement. Students now have problems in mathematics learning because of poor understanding and concept from their previous grades.

### **Participation and Practice**

The extent to which students are asked to do homework has a positive association with school performance implying that the higher the amount of homework, the greater the achievement in SLC. Only 46% of the total students are exposed to homework in their schools, and this percentage is much lower for public school students. Homework is a regular feature in secondary schools with effective performance, while home work is a rare event in ineffective school.

Participation in the classroom teaching and practices is the important variables for the success and failure of students. The case school is a public school. All the

students were from village and they had to work at home. They had no charming of practicing mathematics and active participation in class room teaching. Students were deprived of learning mathematical concepts according to their interest, ability and needs.

The few responses of the students were:

*“I never did mathematics homework and did not pay attention in the class room while teacher was teaching.”*

*(Boy student)*

*Our teacher did not care for weak students. He just taught and spent time. He did not tell anything about homework also. Only talent student asked the questions to the teachers.”*

*(Girl student)*

The above responses indicated that student’s participation and practices mathematics lesson is very poor and it result the failure.

### **Knowledge about Importance of Mathematics**

Mathematics is abstract subject. It has many facts, theory, and other conceptual understanding. On the other hand it is applied science. Student themselves can not relate mathematics in their practical life and teachers also do not relate their teaching with daily life activates.

The response of failure student obtained from interview was the followings:

*“We have to use many formulae while doing or solving mathematical problems, but we don’t know how can we use it in our practical life”*

The negligence in practical aspects of mathematical concepts in teaching activities, lack of use of teaching materials in teaching activities and lack of meaningful teaching in classroom made such situation. This factors contributes failure in mathematics.

## **Psychological Impact in Student that Mathematics is a Difficult Subject**

There are eight subjects in secondary level. Out of them mathematics is a important subjects. Every body says mathematics is most difficult than other subjects. Students themselves, parents, teachers used to say this version. It made the students fear in mathematics. Comparatively students have to use many symbols, theories formulae rules etc in mathematics.

Elsewhere, it has been reported that teachers whether male or female, have low expectations from girls. Teachers perceive the girl students to be incompetent, lazy, submissive and less aggressive as compared to the boys. There are cultural and social barriers for girls to be effective in their learner role in class rooms. Often girls cannot communicate with the male teacher. Psychologically, girls themselves do not have faith in their ability to learn subjects like mathematics and science. It is also found that a number of reasons such as inadequate teaching, poor academic base, lack of remedial support in school overload curriculum teacher pressure made students that mathematics is difficult ,subject even for boys also.

## **Teacher-related Variables that Contributes Failure in Mathematics**

‘It is easy to say a teacher but difficult to be a teacher’. This statement is very important in this context. This study intended to find the cause of failure in mathematics. Here many students are being failed in mathematics. Why this happened and what sorts of variables are contributing in failure from the mathematics teachers. The researcher has taken some variable related to the teachers and each of them have been analyzed.

### Subject Teacher with Qualification and Training

Demography of teachers in case ineffective secondary school is presented below:

**Table 1 : Demography of Teachers in Ineffective School**

S.N.	Name of Teacher	Qualification	Address	Training	Experience	Remarks
1.	Narayan Prasad Lamsal	B.A.	Garui - 7, Dailekh	Untrained	20 year	(HM) Secondary level
2.	Krishna Bhattra	B.Ed.	Malika - 4, Dailekh	Trained	4 year	Secondary level
3.	Lok Bdr. Khatri	B.Sc.	Garui - 1, Dailekh	Trained	10 year	Secondary level
4.	Arun Kumar Sharma	M.Ed.	Dullu - 1, Dailekh	Trained	3year	Secondary level
5.	Krishna Bhandari	M.Ed.	Malika - 9, Dailekh	Trained	10 year	Secondary level
6.	Rana Dip B.K.	B.Ed.	Dullu - 1, Dailekh	Trained	15year	Lower secondary level
7.	Ram Bdr. Thapa	I.Ed.	Dullu - 1, Dailekh	Trained	5 year	Lower secondary level
8.	Tulsi Bhandari	I.Ed.	Malika - 9, Dailekh	Trained	10 year	Lower secondary level
9.	Bhakta Bhandari	S.L.C.	Malika - 9, Dailekh	Trained	12 year	Primary level
10.	Upendra Bhandari	S.L.C.	Malika - 9, Dailekh	Trained	15 year	Primary level
11.	Nara Bhandari	I.Ed.	Malika - 9, Dailekh	Trained	10 year	Primary level

Table presented above shows the present status of teachers in of the school. There are only few teachers for secondary level and others have low qualification and some are untrained. Teachers with teaching experience is most important and they get knowledge of student handling, studying student psychology, teaching strategies and techniques. These factors are regarded as influencing factors for mathematics teaching learning and success! failure.

Schools with well-prepared teachers tend to have high mathematics scores where as low grade and inexperienced teachers result poor achievement. Teachers teaching experience, strategies, ways of presentation, time management, class room handling, psychological treatment to students are some key factors that directly affect teaching learning activities in class room and affect the achievement of the students.

Recurrent teacher training has been adopted as a major strategy for enhancing the quality of student achievement. It is assumed that increased opportunity for professional development through recurrent training would lead to improve teacher professionalism, dedication and motivation, which will positively contribute to student learning. The incidence of teachers attending training courses is high in ineffective schools where students learning does not get a high priority. There could be many more factors causing a negative relationship between training and student performance.

The view of mathematics teacher about training was:

*'School has not provided any refresher training for the betterment of our teaching, even though I am a trained teacher. Our school does not have teaching materials and other references like Teachers Guide (T.G), extra practice book, and curriculum'.*

These views indicated that teachers refreshing and need base training directly affects students mathematics performance.

### **Method, Material and Motivation (3M)**

Teaching is an art. It needs strategy. Teaching strategy means the procedure for effective teaching learning process, handling class effectively, motivating the students encouraging hem for further improvement, involvement of the students in teaching learning activities, psychological and physical treatment of the students etc

are the key factors where teaching strategies give focus on. Planning for different techniques, styles for teaching for teaching learning process are teaching strategies. Believes that ‘telling and discussion is one of the key activities of teaching and learning mathematics which serves as means of developing both language proficiency and mathematical knowledge’.

We can find different strategies, methods, techniques for good teaching strategies. Teacher provides opportunities for student from different racial ethnic, cultural and language groups to interact socially under conditions designed to reduce fear and anxiety.

It is necessary to answer the question of gender and achievement in mathematics focusing the styles of learning strategies, role of cultural in which the benefits of the role models in the society should be consider (by James A Banks, [www. New horizons.org](http://www.Newhorizons.org)).

The National Science Board Commission (1983) found that successful mathematics instruction includes motivating techniques, sufficient time-on -task, high standards for participation and achievement, a coherent course of study with early ‘hand on’ experience, adequate resources, innovative use of available facilities and extensive homework.

Although no single method has proven most effective, a variety of instructional methods do work. This study examines the relation of teaching experiences, their instructional strategies and mathematics achievement.

Students motivation to learn is one of the factors influencing mathematics achievement. The teacher student relationship, encouraging environment of the class room, students environment are some motivating factors.

In order to find out method, materials and motivation as the possible reasons for causing failure in mathematics, the information from interview was used. Some responses obtained were the following:

*‘Most of the students have poor performance in mathematics. Some come from another lower secondary school to get secondary school’s education. They have no*



*pre-knowledge about mathematical, skills and concept. in this condition how the better result achieved?*

*(Teacher of ineffective school)*

*‘Students are lazy. They have no attraction. Telling jokes or doing other motivational activities is only for the time being. There are so many topics which to complete in time. Instruction materials are not available in the school’*

*(Teacher of ineffective school)*

*“Students have no interest in mathematics, they feel it as difficult subject and they hope to pass by cheating and coping in the examination.”*

These views expressed by teacher indicated that the students are poor in mathematics from earlier grades and teachers have their own problems rather than making classroom teaching effective.

### **Behaviour in the Class Room**

Research in education and psychology has demonstrated that teachers and students often understand and shared experience through ‘learning by doing. This topic focuses on relation (behaviour) between teachers and students. understanding through student teacher interaction in teaching learning process.

On the basis of class observation the researcher found that the teacher was giving lecture and some students were listening to him, some were talking to each other. Actually the class was teacher centered. He did not create students participation. He guided few students who were sitting front. There was no question - answer among teacher and students. Teacher behaviour in the class room was more authoritative. Teachers guide for solving problem was not keen. These factor show the reasons how those students ineffective school were failed in mathematics.

*‘Students have no discipline and manner. They never read and discuss among themselves. They only depend upon teacher. Because of time limit and over periods we are busy and tired.’*

*(Teacher)*

The above views indicated that there is no child friendly environment for the students to learn mathematics.

## **Individual Teaching Activities**

Most of the aided community (public) schools have large number of students in class. Many students are kept in a hall or large room and used to teach. There are generally three kinds of learners. Here the slow learners who need special education. And gifted child also need special education for better improvement.

Here, the weak students are not taught in separate room, no individual teaching activities in the class room, teaching focused only to the talented students contributes students failure. The view of teacher about this statement obtained was:

*'We have no extra students, all are same, most of them are very poor. They are not studious and laborious.'*

*(Teacher view)*

The above views of mathematics teacher indicated that there was not individual teaching activities. No special care<sup>o</sup>for weak students in the class.

## **Evaluation, Feedback for the Student**

*'Math is very much practice-based. Student may get a concept in the class room, but they will certainly lose if it is not reinforced by homework (by Evans, www. Csfresonedu/collegian/ archive/200 5)'*

*"We cannot complete homework checking and class work checking of all students everyday. We can not even ask them individually about their homework and mathematics problems. Student participation is also troublesome in classroom because of more students.*

*(Mathematics teacher of ineffective school)*

The above views depicted poor situation of student's evaluation and providing feedback. No regular checking of student's homework and no teachers guide for class work can not enhance the students for their improvement. There is not continuous assessment system (CAS) which is necessary for student's high achievement. Terminal and final examination are taken only for summarise evaluation.

## Administrator - Related Variables that Contributes Failure in Mathematics

Students, teacher and school management (head teacher) are the trio of school foundation. If one can not perform, the system fails. School has to manage all kinds of facilities needed for students and teachers. Among many factors that affect the students' performance, physical and instructional facilities, teaching learning environment of the school, class size, extra class, supervision and monitoring etc are some of them. Teaching materials, library, mathematical laboratory teacher's guide, extra activities are some other factors which make school's teaching learning environment effective.

The researcher kept some variables that contributes students failure related to the administrator and each of them have been analyzed below.

### Physical and Instructional Facilities

The physical and instruction materials of the ineffective school.

**Table 4**  
**Physical Materials**

S.N.	Description	Quantity	Remarks
1.	Play ground	3 Ropani	
2.	Toilets	3	Boys, Girls & Staff
3.	Drinking water .	1	
4.	Library	1	
5.	Maths lab	-	No
6.	Building	6	
7.	Room	16	
8.	Desk bench	100 pairs	
9.	Chair-Table	20+5=25	
<b>Instructional Materials</b>			
10.	Blackboard	15	
11.	Text books	60	All subjects
12.	Reference and practice book	10	Except Maths
13.	Teachers guide! curriculum	10	
14.	Graph board! pin board	2	No
15.	Others charts	15	Different subjects

Analyzing the above data, there were few numbers of teaching materials, instruments and have no teachers guide, curriculum and other references. Physical comfort and environment of school considered as essential part of students learning and subsequent performance. However, there is no conclusive evidence even in the related international literature on the relationship between school resources and student performance.. (CERID 1998 study on student performance in SLC).

About the school condition, the view of head teacher was:

*“Economic condition of our school is not satisfactory. DEO has not provided enough teaching materials and other support. Only few teachers have government grant for salary. We have to bear ourself for other administrative purpose.”*

### **Class Size, Extra Class, Student Upgrading System**

Student number in class room is one influencing factor for teaching learning activities. It is believed that overcrowding class rsulted in a high rate of absenteeism among teachers and students. Teachers reported that overcrowding resulted in stressfull and unpleasant working conditions.

*‘We have more student and less teachers (students teacher ratio) so we can’t break sections for them (students) and also we don’t have sufficient classroom for this purpose.*

*(Head Teacher)*

About students upgrading system, the head teacher’s view was:

*‘We pass all students of all levels. Many students fail in major subjects like maths, English, Science, though they become pass. We have such tradition. If we challenge it, we have to face with their parents’.*

From the above views indicated that there was not extra class for weak students, weaker students were also upgraded and results poor performance in SLC examination.

## **Supervision and Evaluation**

Supervision as an expert technical services primarily aimed at studying and improving co-operatively all factors which affect child growth and development. Supervision is especially related to teaching learning process. In mathematics teaching, supervision is essential to:

To improve mathematics class, to develop new and untrained teacher, to introduce newly developed methods and techniques, to provide continue feedback for teaching, to guide whole program of maths, to improve maths curriculum and text book and to solve teachers professional problems.

For the supervision of mathematics class, the following can be the supervisor should be.

The subject expert and experienced teachers of the related subject. The Headmaster, external supervisor and self supervisor

So supervision plays vital role for the students and teacher to improve their learning and teaching activities. It provides feedback for further improvement. School administration can use class room observation, demonstration teaching, student performance and self supervision etc techniques of supervision

The head teacher, as the chief executive officer of the school is responsible for the processes that will bring about the development of an appropriate school policy, utilizing the best information and the best method of development at the schools' disposal and staff are responsible for ensuring that polices are implemented in such a way as to facilitate their best chance of success.

The studies of effective and ineffective schools have shown consistently that the head teacher is the key factor influencing school effectiveness, measured in terms of pass rates in SLC. Effective schools are found to have stable and firm leadership as opposed to ineffective schools where leadership is found to be weaker unstable. The head teachers in effective schools are characterized as being bold, decisive, under control, task or goad oriented and committed. These traits are largely missing among the head teachers in ineffective schools. The head in schools are able to support, monitor and supervise the instructional staff.

Professional development of the teacher is another aspect of school leadership and supervision is another aspect of professional leadership.

Some responses of head teacher obtained from the interview were:

*'We have no time for supervision because of the full periods teaching and on the other hand we have over qualification and experienced teachers also. So it makes me uneasy for this purpose'*

*"DEO has never visited our school for supervision, though I went myself to introduce the real weakness of school for about such poor performance in mathematics in SLC".*

Here, head teacher's view shows that his effort was failure because of the indifference of DEO. DEO never provided any training or other supportive program to the school. It was also seen that only teaching from ten to four is the duty and not more than that.

Evaluation is another side of student improvement. Effective teaching - learning, teacher's performance level, student performance, student attitude and conduct, methods of teaching etc are the matter of evaluation. For these purpose school administration has responsibility to perform. There should be the system of reward and punishment to encourage or discourage according to the performance level. But this is not seen neither from school administration nor from DEO. Some response of head teacher about evaluation were the followings:

*'There is political bias for awarding or punishing teacher from the SMC and next the poor achievement (failure) of the student in SLC exam even in other subjects is due to the changing of teachers. That is teachers are kept changing. It takes time to feel and understand the new teachers for students.'*

*'Students are weaker from lower grades, and irregular in the class also because of their household work.'*

These above presented views indicated that the school, leadership could not do anything for the betterment of school and student. He evaluated situation but could not develop teachers skills and techniques and reform school environment.

## **Chapter - V**

### **SUMMARY, FINDINGS, CONCLUSION AND ECOMMENDATIONS**

This last and concluding chapter concerns with summary, finding, conclusions and recommendations. After the analysis and interpretation of collected data, an attempt has been made to summarize and enlist of the findings, conclusion and some recommendations for further study.

#### **Summary**

The purpose of this case study was to find out the causes of failure in mathematics in SLC examination. The main objectives for this study were:

- (i) To identify the causes of failure in mathematics in SLC examination from ineffective secondary school.
- (ii) To find out the effect of causing variable on low performance of students in ineffective school of Dailekh district.

For this case study, 10 failure students in mathematics in SLC examination, mathematics teacher and the administrator were chosen from the case school of Dailekh district. The information/data were obtained through interview. Interviews, class observation and school documents were the main tools used for the study. The researcher developed the interview themes with the help of previous studies and thesis supervisor. Also the researcher visited case school for interview and observation. The separate interviews were made for students, teacher and administrator. The information data obtained from different respondents were analyzed and interpreted on the basis of different theories and by using proposed model of students learning.

After analysis and interpretation of the obtained data, the researcher found that there is strong association with causing variables and mathematics achievement. The variable like pre-knowledge of students, practice and participation, teachers qualification and training, method, motivation and materials, teaching learning environment, teaching learning environment of the school etc. directly affect students mathematics performance. At last poor student performance is the function of weak

academic foundation of student, poor assessment and promotion practices, poor teacher management.

## **Findings**

This study is a case study to find the causes of failure in mathematics in SLC examination of an ineffective secondary school of Dailekh district. The researcher found the following major finding of the study:

### **Finding Based on Student- Related Variables**

Different variables influence in student's failure in almost every subject. In this study learner's interest, prior knowledge, participation and practice, knowledge about importance of mathematics and psychological impact in student were found as student related variables. The following were the findings of this study related to students obtained from interview, observation and school documents.

- a. The students were deprived of learning mathematical concepts according to their interest, ability and needs.
- b. Psychological impact of the students that the mathematics is a difficult subject.
- c. Lack of knowledge about the importance of mathematics.
- d. Student did not practice mathematics and no active participation in the classroom teaching.
- e. The students were weaker in lower classes i.e. prior knowledge could not support present achievement.
- f. They do not pay more attention in learning mathematics.
- g. More practice in math is the most.

### **Findings Based on Teacher-Related Variables**

Among different variables, in this study, subject teacher with qualification and training, method, materials and motivation, teacher's behaviour in the class room, individual teaching activities, evaluation and feedback were taken as teacher- related variables. The following were the findings of the study.



- a. New approach in teaching were not applied.
- b. Lack of use of teaching materials in teaching activities.
- c. No individual teaching activities in the class room.
- d. Lack of training to subject-teacher.
- e. No regular checking of students homework and providing feedback to students.
- f. No motivational treatment to encouraging students in teaching.

### **Findings Based on Administrator-Related Variables**

Physical and instructional facilities, teaching learning environment, class size, student upgrading supervision, monitoring and evaluation were taken as administrator related variables. The following were the findings of the study.

- a. Instructional facilities were not available.
- b. Poor and weaker students also were upgraded.
- c. Teaching and learning environment of school was not appropriate.
- d. Lack of appropriate school police for the betterment of school's student and teachers.
- e. Lack of supervision, monitoring and evaluation for improvement of such condition.

### **Discussion of Result**

From the above result we can discuss as given below:

1. Teachers' qualification such as lack of quality of teachers, inadequate knowledge of these subject matter, dependence on textbooks, seminar, workshop, in-service courses, inadequate teaching skills and poor status of teachers effects poor academic performance. This view closely link the 'Theory of Educational productivity' of H.J. Walberg (1981). It concluded that teacher's qualification, quality of instructions and students personal variables are varying essential for increasing pas percentage in mathematics.

2. Method of teaching and learning materials such large number of students, innovative in methodology, instructional materials, inadequate supervision of the inspectors, inadequate lesson plan, dedicated to their subjects, adequate textbooks and school supports are major effect on failure students. These views are closely link with 'Theory of Fear' of John Holt (1964). It concluded that cannot improve SLC result without improving method of teaching and learning activities. So this major centre for every secondary school.
3. School's environment such students' negative attitude background and environment, education of parents, peer groups and divorce among parents are supplementary part of better academic performance. These views are closely link with 'Theory of school effectiveness' of Edmonds (1997) and 'Carroll's Model of School Learning' of Carroll. Therefore, these variables should be maintaining than, the SLC result increase.
4. Students' interest and motivation such as regularity of students and teachers stimulate learning or studies. Discussion among peer groups, attention, encourages asking questions labor, practice of homework, asking question with teachers are also most important aspects in learning sector. These variables closely link with 'theory of Education Productivity' of H.J. Walberg, 'Theory of School Effectiveness' of Edmonds and 'Carroll's Model of School Learning of Carroll. Therefore students' interest and motivation should be positive then the result of SLC examination at mathematics increase.

## **Conclusion**

Teaching learning process has become a great issue in different levels of education. This research has shown that prior knowledge, active participation practice and interest etc from the side of student is essential for the better achievement. Similarly the subject teacher should have strategic teaching techniques. Student and teacher both have devotion and labour towards mathematics learning and teaching. Strategic techniques like motivation seemed less in teachers that increased failure.

Student's creativity could not develop in mathematics because teachers school did not develop proper environment for student. Variables like school environment, school leadership, teacher's behaviour did not support to student learning activities. Besides these all, teaching materials and method as well, as teachers experiences and

training were causing factors for failure in mathematics. School is an institution. It was found in research that all problems of the institution can solve by the co-operation of school administration related subject teachers and district education office.

In this study physical condition of school, prior knowledge of students, teacher behaviour, teachers quality etc are found most contributing factors to students learning. Similarly trend of weaker student upgrading, lack of text books and other essential references, lack of teaching materials, lack of interaction between teacher and students promoted the students failure in ineffective school.

There are so many other schools which have poor performance in mathematics in our country. Basically partially aided community (public) school, they have economic crisis for running school. Our education system, tradition and other multiple factors affected vaguely.

### **Recommendations**

This case study of causes of failure in mathematics in ineffective school has found multiple variables. Student related variables, teachers related variables and administrator related variables were taken for the research. Other variables were controlled. This research itself is not a complete research further researches can be held for further improvement.

On the basis of the findings of this study, following recommendations are suggested.

- a. Due to the shortage of time, this study was limited to the failure students of SLC examination of sample case school, hence the researcher can not generalized the finding of this study to all grade and the whole country. To generalize the finding, such type of researches should be conducted.
- b. The study of this kind should be conducted at all levels of schools in other subjects as well.
- c. National - wide and region-wide research of causes of failure in ineffective school can be done.
- d. Students attitude towards mathematics learning in ineffective school can be done.

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**Appendix - A**  
**Interview Guideline for Key Informants**

Name of student :

Permanent address :

Age :

Roll No. :

Sex :

Caste :

The interview with the key respondents was taken in the basis of following main points.

- ) Personal history
- ) Family background
- ) Reading opportunity at home
- ) Learning opportunity at school
- ) Views about mathematics
- ) Parental support in learning
- ) Mathematics learning style
- ) Teaching method
- ) Views about peer group
- ) Homework and class work
- ) Interest towards subject matter
- ) Psychological impact in students
- ) Teacher's behaviour in the class.
- ) School environment and guardianship.

## Appendix - B

### Interview Guideline for Mathematics Teacher

Name :

Date :

Qualification :

Sex :

Training :

Experience :

#### Interview Themes

- ) Teaching method
- ) Use of homework and class work
- ) Relation behaviour with head - teacher, other teachers and students.
- ) Learning opportunities
- ) Collaboration and co-operation between the school member in school.
- ) Special treatment provided to slow learners
- ) Minimizing individual differences
- ) Problem in teaching mathematics
- ) Motivation to learn mathematics in different level of student in a class.
- ) Role of teacher in creating the good learning culture in class room.
- ) Learning habit of students
- ) Reward and punishment
- ) Extra class for students
- ) Main cause of such result (failure) in SLC.

.....

Interview

.....

Date

**Appendix - C**  
**Interview Format for Head Teacher**

Name :	Date :
Qualification :	Gender :
Experience as a head teacher :	Place of Birth :
Experience as a teacher :	Religion :
Caste/ Ethnicity	

**Interview Guidelines**

- ) Existing condition of school: Physical facility, number of teachers, qualification and training, no. of students, success/failure
- ) Ways of planning and decision making
- ) Educational activities for the teacher and students.
- ) Relationship between teacher and head-teacher.
- ) Professional development of maths teacher.
- ) Supervision, monitoring and evaluation of the teachers.
- ) Learning opportunity for weak students.
- ) Evaluation of students learning difficulties and progress.
- ) Instructional leadership.
- ) Relation with students
- ) Policy of school

.....  
Interview

.....  
Date



**Appendix - D**  
**Observation Area**

- ) Observation of school as well as classroom premises.
- ) Resource available in the school for class room - purpose.
- ) Class size, seats, students sitting pattern.
- ) Interaction between students-teacher and teacher - student in the class room.
- ) Teacher collaboration -and discussion in subject matter.
- ) Participation of student in class room activities and extra activities.
- ) Learning environment in the school.
- ) Teacher behaviour towards teaching - learning process.

**Appendix E**  
**Class Observation Form**

Name of School:

Class :

Time :

Sub :

Unit/Topic

Period :

S.N.	Description	Level score	Low 1	Moderate 2	Satisfactory 3	Excellent 4	Remarks
1.	Personality of teacher <input type="checkbox"/> Neat and clean <input type="checkbox"/> Self confidence <input type="checkbox"/> Clear voice <input type="checkbox"/> • Language <input type="checkbox"/> Appearance						
2.	Initiation of Topic <input type="checkbox"/> Class management. <input type="checkbox"/> Motivation toward lesson						
3.	Presentation <input type="checkbox"/> Knowledge of subject matter <input type="checkbox"/> Order of presentation <input type="checkbox"/> Appropriateness of example <input type="checkbox"/> Relation with curriculum						
4.	Student activity <input type="checkbox"/> Student participation <input type="checkbox"/> Question answer <input type="checkbox"/> Discipline						
5.	Use of instructional materials <input type="checkbox"/> Clearly visible <input type="checkbox"/> Clearly understanding <input type="checkbox"/> Related to topic <input type="checkbox"/> Appropriately used						
6.	Use of blackboard						
7.	Teachers Activities <input type="checkbox"/> Lecture <input type="checkbox"/> Demonstrations <input type="checkbox"/> Encouraging students						
8.	Appropriateness of teaching method						