

STUDENT LEARNING DIFFICULTIES IN ANTI- DERIVATIVE

A THESIS BY

BINOD SAPKOTA

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LETTER OF CERTIFICATE

This is to certify Mr. **Binod Sapkota**, a student of the academic year **2018/2019** AD with thesis number 1575 Exam Roll No. **7328327**, Campus Roll No. **193**, and T. U Regd. No. **9-2-57-134-2012** has completed his thesis under my supervision during the prescribed by the rules and regulations of T. U Nepal. The thesis entitled “**Student Learning Difficulties In Anti-Derivative**” embodies the result of his investigation conducted from **2020 to 2021** at the Department of Mathematics Education, University Campus, Tribhuvan University, Kirtipur, and Kathmandu. I recommend and forward that his thesis is submitted for evaluation to award the Degree of Master of Education.

Date:

.....

Prof. Dr. Bed Raj Acharya

Head

LETTER OF APPROVAL

Thesis Submitted

By

Binod Sapkota

Entitled

“Student Learning Difficulties in Anti-Derivative”

has been approved in partial fulfillment of the requirements of the Degree of
Master of Education.

Viva-Voce Committee

Signature

Prof. Dr. Bed Raj Acharya

.....

Chairman

.....

.....

External

Prof. Dr. Bed Raj Acharya

.....

.....

Supervisor

Date:

RECOMMENDATION FOR ACCEPTANCE

This is to certify that Mr. **Binod Sapkota** has completed his M. Ed. thesis entitled “**Student Learning Difficulties in Anti-Derivative**” under my supervision during the period prescribed the rules and regulations of Tribhuvan University, Kirtipur, and Kathmandu, Nepal. I recommend and forward his thesis to the Department of Mathematics Education to organize the final viva-voce.

.....

Prof. Dr. Bed Raj Acharya

Supervisor

Date:

DEDICATION

*This thesis is dedicated to my father **Mr. Nep Bahadur Sapkota***

*my mother **Mrs Indra Sapkota** Whose love, support, and encouragement have enriched my soul
and inspired me to*

Complete this research.

DECLARATION

This dissertation contains no material which has been accepted for the award of another degree in any institution. To the best of my knowledge and belief, this dissertation contains no material previously published by any authors except due acknowledgment has been made.

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Binod Sapkota

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.....

Binod Sapkota

ABSTRACT

This study intended to explore the student learning difficulties in anti-derivative and to analyze the cause of difficulties in learning anti-derivative. The study was based on case study design. Researcher had faced difficulties on teaching and learning during the practice teaching in class eleven. So the researcher selected this problem as a research. The researcher selected mathematics teacher, head teacher and five students as the respondent for the interview of selected school. The tools used in data collection procedure were class observational note in depth interview and test. Collected data were analyzed by the thematic analysis method and triangulation approach and draw conclusion with the help of social constructivism learning theory and Cognitivist learning theory. After analysis and interpretation of data, the findings indicates students have learning difficulties in concept of anti-derivative, problem solving approach, integration by parts rule, power rule of Anti-derivative due to lack of pre-knowledge, relationship between students and teacher, Class Room Practice, traditional teaching strategies. Poor family students get low opportunity for study and illiterate parents are weren't aware for children study. Parents are illiteracy is one of the major factors and they were unable to teach at home. Lack of weak economic background of students, students have to do household. Lack of active participate of student, teaching learning process of anti-derivative is not effective. There is lack of teaching materials and teacher cant using teaching materials in mathematics classroom, Due to complex and large syllabus, Teacher have certain time period for finished the course student have no sufficient time for classroom practice since, anti-derivative learning seems to be difficult.

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Chapter - I

INTRODUCTION

Background of the Study

Mathematics is essential everywhere, so there is no any field which can run without mathematics. Mathematics is the science that deals with the logic of shape, quantity, and arrangement. Mathematics is all around us in everything we do. It is the building block for everything in our daily life. Several civilizations in china, India,Egypt,Central America and Mesopotamia contributed to mathematics as we know it today. Math helps us think analytically and have reasoning abilities. Analytic thinking refers to the ability to think critically about the world around us. Analytical and reasoning skills are important because they help us solve problems and look for solutions .mathematics is essential in many fields including natural sciences, engineering, medicine, finance and the social sciences.

Calculus is branch of mathematics that involves the study of rates of change. Before calculus was invented all math was static. It could only help calculate objects that were perfectly still. But the universe is constantly moving and changing. No objects from the starts in space to subatomic particles or cells in the body are always rest moving .calculus helped to determine how particles, starts and matter actually move and change in real time.

Gofffried Leibniz and Isaac Newton 17th century Mathematics both invented calculus Independently Newton Invented it first, but Leibniz created the notations that mathematicians today. There are two types of calculus Differential calculus determines the rate of change of a quantity,while integral calculus finds the quantity where the rate of change is known .

Garnett(1985) mentions that mathematics learning difficulties are common. Significant and worthy of serious instructional attention in both regular and special education class. Students may respond to repeated failure with drawl of effort, lowered self-esteem and avoidance behaviors. Most common are difficulties with efficient recall of basis arithmetic's fact and reliability in written computation. While important to work on such efforts should not deny a full mathematics education to otherwise capable students.

Learning difficulties constitutes a condition which creates an obstacle to specific to specific form of learning but does not affect the overall IQ of an individual. A learning difficulties is a condition that can cause an individual to experience problems in a traditional classroom learning context. A child or adult with learning difficulty may require additional time to complete assignment at school and can often benefit from strategy instruction and class room accommodations such as material delivered in special fronts or the ability to use computer to take notes.

Anti- derivative

Anti-derivative are the opposite of derivative. An Anti-derivative is a function that reverses what the derivative does one function has many Anti-derivative, but they all take the form of a function puts an arbitrary constant Anti-derivative is a key part of indefinite integral. Anti-derivative a function F is an anti-derivative of the function f if $F'(x) = f(x)$ for all x in the domain of f .

In calculus an anti-derivative or indefinite integral of a function f is a differentiable function F whose derivative is equal to the original function f . This can be stated symbolically as $F' = f$ the process of solving for anti-derivative is called anti-differentiation or indefinite integration and its opposite operation is called differentiation which is the process of findings a derivative.

Anti-derivative are related to definite integrals through the fundamental theorem of calculus, the definite integral of a function over an interval is equal to the difference between the value of an anti-derivative evaluated at the end points of the interval. Indefinite integral and anti-derivative are the same thing. Given a function $f(x)$ an anti-derivative of $f(x)$ is any function $F(x)$ such that $F'(x) = f(x)$

If, $F(x)$ is any anti-derivative of $f(x)$ then the most general anti-derivative of $f(x)$ is called an indefinite integral and denoted by $\int f(x) dx = F(x) + c$ where, c is any constant in this definition. \int Is called the integral symbol, $f(x)$ is called integrand and x is called Integration variable, c is called the constant of integration.

The function $F(x) = x^3/3$ is an anti-derivative of $f(x) = x^2$, as the derivative of $x^3/3$ is x^2 as the derivative of a constant is zero. x^2 will have an infinite number of anti-derivatives, such as $x^3/3$, $x^3/3+1$, $x^3/3-2$ etc. Thus, all the anti-derivatives of x^2 can be obtained by changing the value of c in $F(x) = x^3/3+c$, where c is an arbitrary constant known as the constant of integration.

There are so many integration rules in class xi. For e.g. Chain rule, sum rule, difference rule, multiple by constant, power rule, reciprocal rules in integration.

Sumrule and Difference rule:

- $\int (f + g)dx = \int f dx + \int g dx$
- $\int (f - g)dx = \int f dx - \int g dx$

Power rule of integration:

- $\int x^n dx = \frac{x^{n+1}}{n+1} + c$

Integral of a function f multiplied by a constant k:

- $\int kf(x)dx = k \int f(x)dx$

Integration by parts rule:

- $\int uv dx = u \int v dx - \int \left(\frac{du}{dx} \int v dx\right) dx$

Where, u =function of x

v =function of x

Statement of the Problem

Formulating a research problem is the first and most important step in the research process. A research problem identifies our destination. Mathematics is taken as a difficult subject by most of the students in +2 level are shown by the result of higher secondary education board examination and previous research. Burner says that all students can learn mathematics. In

calculus students seems to very weak from other branches of mathematics. Among the part of calculus anti-derivative is one of the most important and applicable part of the calculus .anti-derivative is a complex concept for students in class XI.Mathematics curricula of Nepal have given emphasis on Anti-derivative from the class xi. But most of the students of grade xi felt difficulties in problem solving anti-derivative.

Must of the students taken as anti-derivative is difficult chapter comparative of the other chapter such as set, trigonometry, matrix etc. anti-derivative is very important for findings the area under the curve and it is directly related to concept of limit and derivative a couple of month ago when I had been gone as a teacher in class XI then I felt some teacher and most of the students anti-derivative is seen as a difficult chapter in high school .there was low achievement of students in anti-derivative. I am interested to know where and why students faced difficulties in learning and solving anti-derivative problems, so in this regard this study mainly attempts to address the following research questions.

- What are the difficulties faced by students in learning anti- derivative?
- What is the cause responsible for difficulties in learning anti-derivative?

Objectives of the Study

- To explore the difficulties of students in learning anti-derivative.
- To analyze the cause of difficulties in learning anti-derivative.

Justification of the Study

Different studies and researches are important for their own field, this study provides information about student's difficulties in learning anti-derivative and cause of difficulties in learning anti-derivative at grade XI. This study is significant for student's teacher and planner who are known students difficulties in learning anti-derivative, this study will help the mathematics teacher to understand the gap of the students and apply in the teaching learning activities. This study will be helpful for further research about anti-derivative.

Delimitations

This study was delimited to find out students difficulties in learning anti-derivative.

- This study was limited to only at Surkhet district.
- The study was limited to only five students in school.
- This study was carried out within the certain area so its findings cannot be generalized among all students.
- This study covered only indefinite integral of grade xi mathematics.
- This study was done the basis of mathematics test, interview and class observations.

Definition of key Terms

Every study constitutes of the key words depending upon the problem, topic, method and variables. The researcher uses the following terms and the operational terms which were defined as follows.

Difficulties:Inthis study difficulty means those students who are unable to understand terms, meaning, and concept application of ant derivative in grade xi.

Students:Students mean the person who involves in learning class xi mathematics.

Problem:Problem are that things which is difficult to deal with or to understand during learning mathematics.

Pre-knowledge:Pre-knowledge is the knowledge the learner already has before they meet new information.

Trained teacher:Trained teacher means those teacher who have got any type of training related to academic field at least six months and the remaining are categorized as untrained teacher for the purpose of the study.

Learning environment: Learning environment means the environment of the mathematics

Chapter - II

REVIEW OF RELATED LITERATURE

Empirical Literature

Pokhrel (2019) studied on "cause of low performance of students in mathematics" intended to find out the causes of low performance in mathematics and to identify the strategies taken by school to improve mathematics performance of students. Qualitative case study design was used as a research design. Four students of grade x were selected by purposive sampling method. Direct interview with four low performance students in mathematics, classroom observation, respectively teacher, head teacher and parents of the school were taken. Collected information was analyzed by using different theories. He was found that socio economic status was very poor, learning culture was negative, poor facilities classroom management, traditional teaching methods, lack of reinforcement and feedback in classroom, lack of teaching materials and lack of qualified training teacher, lack of teaching materials and lack of qualified training teacher.

Bajracharya(2010)studied on "factor affecting students related variables and mathematics achievement " conclude that the finding of the study ,out of five students related independent variables,standardized coefficients are used to compare the contribution of independent variables whereas unstandardized coefficient are used for constructing a regression equation. The researcher found that the above empirical research the performance of students are dependence are so, many factors some of these factors are occupation of parents, parents education, economic status of parents, facilities of child to provides their parents etc.

Kafle (2019) studied on "Conceptual and procedural difficulties in learning in derivative" intendant to explore the difficulties of conceptual understanding and to explore the difficulties of the procedural understanding of the derivative case study was used as research design. The case for this study was the students of the grade XI. 40 students of grade XI was selected by purposive sampling. The study site was Makwanpur Multiple Campus. The total four problems were asked in the CPUBT which was constructed on the basic of APOS theory. The finding of

this research were Weak concept to understanding the derivative as rate of change, Unable to understand the clear geometrical meaning of the derivative, Unable to make exact sense of limit necessary to study the derivative, Unable to use power rule to find derivative, A student becomes exam oriented which makes the derivative as one of the difficult topic.

Regmi (2019) this is a qualitative research entitled with "Exploring Conceptual and Procedure Learning Difficulties in School Coordinate Geometry" is intended to explore conceptual and procedure difficulties faced by the student in learning coordinate geometry. He used mathematics achievement test and in-depth interview tools to find and perceived learning difficulties. This study based on case study research design. The four school of Kaski districts comparing total of 80 students were selected for the sample of study. In conceptual difficulties, student feels difficulties in defining co-ordinate term, symbolization, mathematical representation of the term, visualizing and understanding the object, recognizing abscissa and ordinate. In procedural difficulties, student feel difficulties in using appropriate formulas, solving procedure, selecting proper formula, assuming coordinate, substituting assuming value in formula, understanding ratio, points and its relationship, solving equation, recognizing variable and constant in equation. So the result show that some students had difficulties in mathematics in mathematical term or mathematical symbolization or mathematical representation, so teacher should focus on mathematical vocabulary. Teacher should visualize the mathematical vocabulary. Teacher should be focus on the concept of coordinate geometry. Teacher should use teaching materials for teaching. Teacher should focus to establish the interrelation between the properties of figure or object.

Rahaman (1981) did his thesis for Master's Degree on "Achievement in mathematics by sex: A study of sex differences in achievement in mathematics of seventh grade students in selected schools of Kathmandu Nagar Panchayat Area with the objectives to investigate whether sex

influenced the achievement in mathematics. Achievement test (Knowledge, Skill, Comprehension and Application) in Arithmetic, Algebra, and Geometry was prepared and administered in five schools. The t-test was applied to conclude that the superiority of the boys over the girls with respect to achievement in mathematics as a school subject with regard to achievement in mathematics by area and also cognitive levels.

Bhandari (2017) studied on " Difficulties in learning group theory" intended to explore students difficulties in learning group theory at grade XII, and to analyze the cause of difficulties in learning group theory in grade XII. Qualitative case study design was used as a research design. Five case students were selected by purposive sampling method from a school. This study was conducted in a school with five case students by using interview and set of questions consisting of five different domains: understanding, reasoning, proving process, problem solving, and reducing abstraction was prepared on the basis of blooms taxonomy of educational objectives. The result from the test administration and interview of the respondent's information was analyze and strengthened with the help of related literature review supportively and validating the result further APOS frame work was used. Major finding of this research were, Understanding, Lack of link between pre-learned concepts, Reasoning, less interests and motivation towards solving group theory problems.

Gautam (2016) studied on "Difficulties in learning vector geometry in school level" intended to explore the different kinds of difficulties in learning in vector geometry and to find the ways to minimize these difficulties in secondary level. Descriptive survey design was used as research design. This study was conducted in public secondary school with seven case students by using test, interview and observation as research tools. Major findings of this research were Attention difficulties, Conceptual output and organizational difficulties, Language difficulties.

Theoretical literature

There are so many theories which can be used to understand the learning difficulties in the mathematics. Besides the above theory I will use cognitivist learning theory and constructivism learning theory.

Cognitivism

According to Woolfolk cognitivism is a general approach that views learning as an active mental process of acquiring, remembering and using knowledge. They give the place to the role of perception, organization, insight, understanding and the mental exercise rather than the blind trial error in learning. Knowledge is learned and changes in knowledge makes changes in behavior possible (Aryal, 2009).

The cognitivist paradigm essentially argues that the "black box " of the mind should be opened and understood .The learner is viewed as an information processor like a computer. Cognitivism focuses on the inner mental activities -opening the "black box " of the human mind is valuable and necessary for understanding how people learn.Mental processes such as thinking, memory, knowing and problem solving need to be explored knowledge can be seen as schema or symbolic mental constructions .learning is defined as change in a learner's schema. The basic assumption of cognitive theory as essence of knowledge is structure but not a basket of facts .the work of jean piaget presents the most comprehensive views of this theory according to whom, overall,development follows the four stages from birth to maturity. Those stages are sensory motor stage, pre-operational stage, concrete operational stage, and formal stage.

Constructivism Learning Theory

Social constructivism theory was developed by Vygotsky. Social constructivism is focused much on learning through cooperative group learning. It emphasizes the importance of culture and context in understanding what occurs in society and constructing knowledge based on understanding .social constructivism believe that reality is constructed through human activity. Member of society together invent the properties of the world. For the social constructivism, reality cannot be discovered that it does not exist prior to its social inventions.

Constructivism as a paradigm or world view posits that learning is an active, constructive process. The learner is an information constructor. People actively construct or create their own subjective representing of objective reality .new information is linked to prior knowledge. This

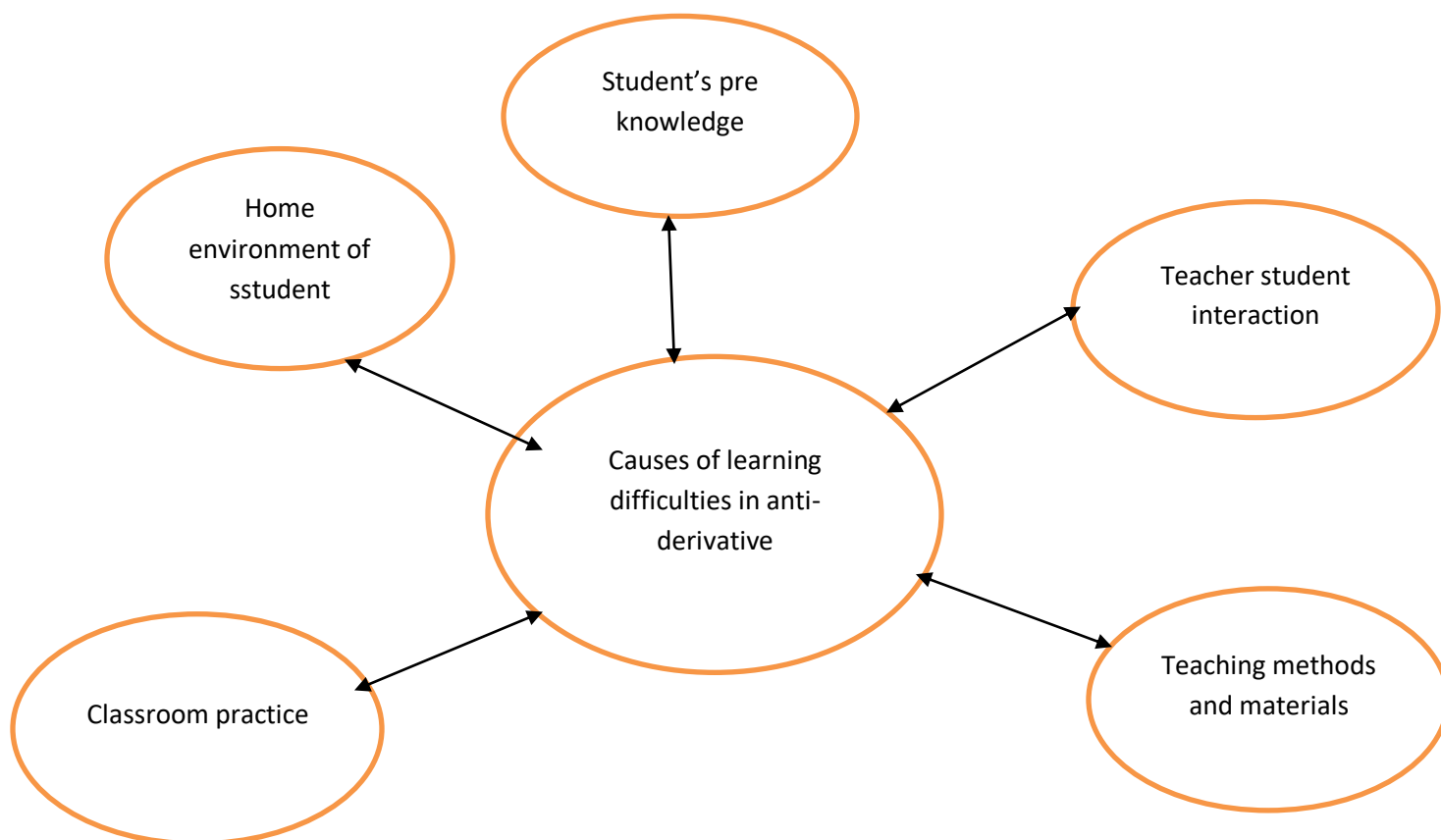
mental representations are subjective .constructivist assumes that knowledge is actively constructed by learner not passively transmitted by teachers.

Social constructivism is a sociological theory of knowledge according to which human developed is socially situated and knowledge is constructed through interaction with each other. Knowledge is socially constructed and our culture is foundation of construct knowledge. The constructivism theory also elaborated that the opportunity to learn the mathematics, students at home play vital role in mathematics achievement. It is conclude that the lack of sufficient time for mathematics learning. At home of students is one of the cause for difficulties in learning mathematics. Due to poor economic condition of students cannot manage their time at home for mathematics learning.

Radical constructivism is the idea that all learning must be constructed and there is no utility or meaning in instruction that is teacher or text book driven radical constructivism is often referred to in reference to mathematics.

Conceptual Framework

This study tried to find out the difficulty in learning Anti-derivative at grade XI. The following conceptual framework has purposed to identify the difficulties and to find out the causes of difficulties, what are the cause responsible for students learning difficulties Anti-derivative. These variables affecting students learning process in anti-derivative are student's pre knowledge, teacher student's interaction, classroom practice, teaching method and materials and learning environment .in this regard I was study on cause of difficulties in anti-derivative on the basis of following responsible factor.



Students Pre-knowledge

Student's pre-knowledge is the knowledge the learner already has before they meet new information. A learner's understanding of a text can be improved by activating their pre-knowledge before dealing with the text and developing this habit is good learner training for them. The importance of engaging prior knowledge when someone asks you a question or you have a new problem to solve the knowledge that you bring forward in to your working memory to formulate an answer or explanation is the knowledge that you have already integrated in to your understanding of the subject. Mathematics knowledge has constructed by integrating different mathematics knowledge so, that anti-derivative is related to limit and continuity, derivative etc.

TeacherStudent's Interaction

Teacher who have positive interaction with their students create classroom environments more helpful to learning and meet students development, emotional and educational needs. Cognitivist and constructivism learning theory said that "interaction is the foundation of construct knowledge.

Teacher student interaction has an impact on classroom management and affects learning and growth. According to development perspective the establishment of a positive teacher student's relationship aids a student's cognitive, social and emotional growth and enhances their mental wellbeing. (Brazelton & Greenspan, 2000)

Teacher who had positive and secure relationship with student's reported that their students were less likely to stay away from school appeared more independent more supportive and busy in learning. (Birch & Ladd, 1997) (Importance of teacher student interaction)

Classroom Practice

Classroom practice as a process, involves multiple agents and their interaction with in the classroom as a system .practice is the key factor of learning. The success of learning and educational plan depends on the classroom practice.

Students benefits from practice because they are able to apply knowledge through interaction. Students connect with the materials when they work with texts and concepts beyond a onetime exposure when students practice using the knowledge through application they connect with information on a deeper level.

Teaching Method and Materials

A teaching method comprises the principles and methods used by teacher to enable. Students learning .constructivist teaching is based on the belief that learning occurs as learner are actively involved in a process of meaning and knowledge construction as opposed to passively

receiving information .teaching methods plays vital role for effective teaching.Teaching materials refers to a spectrum of educational materials that teachers use in the classroom to support specific learning objectives as set out in lesson plan .teaching materials is a generic term used to describe the resources teachers use to deliver instruction. Teaching materials can Support students learning and increase student's success.

Home Environment of Students

A positive learning environment is the one where learners feel involved and responsible for their learning while being comfortable enough to fully participate group and individual activities. A learning environment is the educational setting and how it looks and feels and can be positive or negative. Teacher can impact the learning environment in many ways inclining the physical, psychological and instructional setting .learning environment in teacher's classroom is vital to student's success and impacts students in many ways.

Elizabeth faster in her study "home environment and the school" 1986, investigated whether there is a relationship between factors in the home environment of the child and his progress in school. She found out that factors in the home environment correlated with school more than they did with school more than they did with intelligence. The environmental factors which she found to have contributed most of the difference were partly socio economic. Motivational and emotion. It follows therefore that the socio economic status of the parent together with atmosphere of the home impact of the children academic performance seeing the emotional state of the child determines how success he is going to be in his academic pursuit.

Chapter-III

METHOD AND PROCEDURES

This chapter presents the method and procedures of the study which was carried out to achieve the objectivities of the study method is the guideline, which helps the researcher to research in a scientific and systematic way. This chapter includes the design of the study, population of the study, sample of the study, tool instruments of the data collection. Data collection procedural and data analysis procedure in different subsection. The present research focused on "learning difficulties in learning anti-derivative.

Research Design

Research design is the framework of research methods and techniques chosen by researcher. The design of a research topic explains the type of research .research design is a plan to answer your research question .a research method is a strategy used to implement that plan. Its main importance is to help researcher to collect data, interpret and analyze data the conducted study was essentially qualitative in nature .the researcher used descriptive case study design.

Selecting of Study Site

The selection of study area is very important in case study. Students who are studying in the school, obtaining easy access, establishing rapport, getting information, and gathering data directly related to the researcher interest are the main criteria for selection setting. So, researcher has selected purposively shree bageswori higher secondary school simta surkeith. The researcher has a convincing reason for selecting the school that it is located in this area there are low achiever students in mathematics.

Sampling of the Study

The accuracy of your findings largely depends upon the way you select your sample. The basis objective of any sampling design is to minimize, within the limitations of cost, the gap

between the values obtained from your sample and those prevalent in the study population. The underlying premises in the sampling is that a relatively small number of units, if selected in a manner that they genuinely represent the study population can provide with a sufficiently high degree of probability a fairly true reflection of the sampling population that is being Studied (Kumar R., 2011).

The sample of this study was consists of 5 students of government school,1teacher and 1 head teacher. The sample of students was selected by purposive sampling method for this study.

Data Collection Tools

In this study researcher generated data through classroom observations form, mathematics achievement test,in depth interview etc. .

Classroom Observation Form

In the way of collecting primary data the observation method if commonly used. It has become a scientific tool and the method of data collection for the research it is systematically planned and recorded and is subjected to check on validity and reliability. Under this method the information is sought by the way investigator own direct observation without asking from respondent the classroom observation form is developed by the researcher with the involvement of experts. The researcher was observed 5 classes with observation form and take participation and non-participation role when observing class room interaction and teaching learning activities of the class. Researcher will observe classroom activities of students and teacher, reaction and participation of the students.

In-depth Interview

In-depth interview is a qualitative data collection methods that involves direct, one to one engagement with individual participants in depth interviewing can take place face to face or in some cases over the phone the advantage of in-depth interview over focus group include the following: better rapport in a one to one setting. In this research the researcher used in depth interview with respondents. The researcher took the interview on the basis of the objectivities the researcher will develop interview schedule in semi structured form on the basis of observations conducted in the classroom,activities of individual, participation of classroom and groups in

different setting. The researcher took interview with students, mathematics teacher and head teacher. Interview was taken with the randomly selected students in classroom.

Test

Test is a kind of assessment which was taken as a paper pencil test with students. It is widely used to evaluate the student standards. It helps to examine knowledge of students acquired from the certain content. Test was set of questions which makes by researcher purposively from the certain content of anti-derivative. Question were selected purposively to examine the knowledge of students and to explore the difficulties in anti-derivative. After making the set of questions. The researcher administered it with the grade XI students. After checking the test items I discussed and explore the difficulties with them. Mathematical tests has used for only support my study. It is helpful for finding the student difficulties in anti-derivative.

Validity and Reliability of Tools

Reliability is about the consistency of a measure and validity is about the accuracy of a measure. The validity and reliability are necessary for research instruments. The subject expert, specialist and supervisor will use to check the reliability and validity of the data collection tools. The word triangulation was used widely in the discussion of qualitative research. So I was used triangulation method for cross validation of the information obtain from respond.

Data Collection Procedure

At first I visited the case school and take the permission from the head teacher for in this research, observation form and interview guidelines were used as a data collection tools. After taking permission researcher will observe the classroom using observation form for ten days in grade XI. The researcher watched, listened, interacted and noted the essential data from the information about learning environment and activities in real situation researcher took interview with teacher, head teacher and 5 students with the help of interview schedule guide line.

Data Analysis and Interpretation

Data analysis is the most crucial part of any research data analysis summarizes collected data. Data analysis is the process of inspecting , rearranging , modifying and transforming data to

extract useful information from it data analysis is process that involves examining and molding collected data for interpretation to discover relevant information, draw or purpose conclusion and support decision making to solve a research problem, meaning are identified and information is interpreted. (Creswell, 1994).

All information were collected from primary sources. The data was collected by interview and observation with students, mathematics teacher and head teacher. In this study I used thematic analysis method for data analysis. For this I arranged the data, transcribed the data,coded, and made themes and reported findings.

Chapter – IV

ANALYSIS AND INTERPRETATION OF DATA

Data analysis is the process of systematically applying statistical and logical techniques to describe and illustrate, condense and recap, and evaluate data. An essential component of ensuring data integrity is the accurate and appropriate analysis of research findings. Data interpretation is the process of reviewing data through some predefined process which will help assign some meaning to the data and arrive at a relevant conclusion. It involves taking the result of data analysis.

This is a qualitative study related to the learning difficulties in anti-derivative at class eleven. To fulfill the objectives of this study, the researcher selected Bajeswori Higher Secondary School Rakam 6, Simta, Surkhet. According to the objectives of this study, the researcher marked the response of the students very carefully and noted their outcomes systematically on the basis of classroom observation, mathematical test, and interview guidelines. The researcher analyzes and interprets the obtained data.

Anti-derivative in Math

Anti-derivatives are the opposite of derivatives. An anti-derivative is a function that reverses what the derivative does. One function has many anti-derivatives, but they all take the form of function plus an arbitrary constant. Anti-derivatives are a key part of indefinite integrals. There are some rules in anti-derivatives: they are the chain rule, power rule, sum rule, and difference rule, and the constant rule in anti-derivatives.

The data was collected for the study from Bajeswori Higher Secondary School Rakam 6, Simta, Surkhet. Purposely, the data was collected using an interview schedule and classroom observation form. The collected data were tabulated and analyzed according to the objective of the study. The obtained data were analyzed and interpreted by using a descriptive method.

Difficulties on Problem Solving

Problem solving is a mental process that involves discovering, analyzing, and solving problems. The ultimate goal of problem solving is to overcome an obstacle and find a solution that

best resolves the issue. The best strategy for solving a problem depends largely on the unique solution. In some cases people are better off learning everything they can about the issue and then using fact full knowledge to come up with solution. (2020, Goldman)

“Students are not able to able identifying the problem so that students difficulty on problem solving technique”

-Mathematics teacher

$$\textcircled{b} \int \frac{3x+5}{\sqrt{x+1}} dx$$

$$= \int \frac{3x+3+2}{\sqrt{x+1}} dx$$

$$= 3 \int (x+1)^{1/2} dx + 2 \int (x+1)^{1/2} dx$$

$$= \frac{3(x+1)^{1/2+1}}{\frac{1}{2}+1} + \frac{2(x+1)^{1/2+1}}{1/2+1} + C$$

$$= \frac{3(x+1)^{3/2}}{3/2} + 2(x+1)^{3/2} + C$$

Problem solving technique is very important in anti- derivative. It is a technique and creativity of students. From the mathematical achievement test there was lack of problem solving technique in anti-derivative. In problem solving there is identifying the problem, planning, impletion of planning, and evaluation of solution.

Difficulties on Applying Integration by Parts Rule

Integration by parts is a special method of integration that is often useful when two functions are multiplied but it's also helpful in other ways.

- $\int uv dx = u \int v dx - \int \left(\frac{du}{dx} \int v dx \right) dx$

Where, u is the function of x and v is the function of x.

This difficulty refers the difficulty in findings anti-derivative by using integration by parts rule. Only the process of anti-derivative was seen to find difficulty in this category. If the student's students cannot able to find the derivative using by integration by parts rule such rule is categories as difficulty in using integration by parts rule to find the difficulty question was asked to the students.

(1) $\int e^{x^2} 2x dx$
 ans: $y = x^2$
 $\frac{dy}{dx} = 2x \Rightarrow dy = 2x dx$
 $\int e^y y dy = e^y \int y dy - \int \left(\frac{de^y}{dy} \int y dy \right) dy$
 $= e^y \cdot \frac{y^2}{2} - \int e^y \cdot \frac{y^2}{2} dy$
 $= e^y \frac{y^2}{2} - \frac{1}{2} \int e^y y^2 dy$
 $= e^y \frac{y^2}{2} - \frac{1}{2} \left(e^y \int y dy - \int \frac{de^y}{dy} \int y dy \right) dy$

From the mathematical test most of the students were failure in effective applying of integration by parts rule. There was two function u and v. Students was failure which function considering as u and v.

Difficulties on concept of anti- derivative

Generally anti- derivative is the opposite of derivative. An anti- derivative is a function that reverse what the derivative does. If derivative of x^2 is $2x$ then the anti- derivative of $2x$ is equal to x^2 . Hence derivative and anti-derivative is reverse process. From mathematical achievement test most of the students had lack of exact concept of anti- derivative.

Generally, if $\frac{d}{dx}F(x) = f(x)$ then $F(x)$ is called an anti-derivative of $f(x)$

Students were not unable to clear concept of anti-derivative. Must of the students could not give an appropriate meaning of anti-derivative? For this, objective question was

Q. if $\frac{d}{dx}x^3 + 3 = 3x^2$ then what is the anti-derivative of function $3x^2$?

Q. which is the best answer about anti-derivative?

i) no relationship between derivative and anti-derivative ii) anti-derivative as the reverse process of derivative iii) derivative and anti-derivative are same concept

I: why do you leave the above questions?

Student A: I don't have any idea and I feel it is very difficult.

I: can you find out the derivative of $x^3 + 3$

Student B: yes

Above interview justified that student able to find out the derivative of the function but students not able to solve these problem? Student have lack of concept of anti-derivative.

Difficulties on Finding Anti-derivative by Using Power Rule

When x is used to respect a variable and n represents a constant an algebraic expression a^n is formed in exponential form. The algebraic expression is defined in variable x . So the in defined

integration should be done with represented to x and it is written in mathematical form as follows $\int x^n dx$.

The in-defined integration of the function x^n with respect x is equal to the sum of the quotient of x raised to the power of $n+1$ divide by $n+1$.

$$\text{Symbolically, } \int x^n dx = \frac{x^{n+1}}{n+1} + c$$

This difficulty refers the difficulty in findings anti-derivative by using power rule of anti-derivative. Only the process of anti-derivative was seen to find difficulty in this category. If the student's students cannot able to find the anti-derivative by using quotient rule, such rule is categories as difficulty in using power rule.

“Student cannot able to effective applying of power rule of anti-derivative”

-Mathematics teacher

Q. $\int (3-4x)^5 dx$

Soln:
$$= \frac{5(3-4x)^{5+1}}{5+1}$$

$$= \frac{5 \cdot (3-4x)^6}{6}$$

$$= \frac{5(3-4x)^6}{6} \quad \text{Ans}$$

From above students answer and above analysis it is conducted that they have difficulties about applying a power rule of integration. Students cannot able to generalize the power rule of integration in the different condition.

The collected data were analyzed under the following main headlines which relates to the conceptual frame work and objective of the study.

- Class room practice
- Students pre knowledge
- Teaching method and materials
- Home learning environment
- Teacher students interaction

Now, here researcher described about the given above topics according to collected data which are collected by mathematics teacher, parents, head teacher and students using observation form and interview.

Class Room Practice

The practice stage is one of the most vital steps in the teaching learning process. It allows learner to test their ability to apply the skill that they learned now and novel situation. Guided practice and independent practice to play vital role in effective learning. Class practice is the most important aspect of learning. The success of learning and educational plan and programs depends on the classroom practice class room practice refer to everything that goes in the classroom. It includes the relationship interaction and communication between teacher and students and among the students. (Karmachraya, 2001)

Practice is the most important to learning that effect the achievement in mathematics. For this researcher had taken interview to students, mathematics teacher, parents and head teacher.

Does practice affect the achievement in mathematics?

“We have only 45 minute time in mathematics period. We have certain time period for complete our mathematics course. There are lots of students in classroom. So, it’s not possible to conduct individual instruction learning in their own places and discuss.” - Mathematics teacher

“It is a rural area .every day students are no attending the class regularly due to their home problem. Most of the students has very weak economic condition. So that students are not able to give more time to practice” –Head teacher

“Every day I have been coming four to five kilometer far from our collage. So that we are very tired also we have to do work in home .so we are not able to give more time to practice.” – Students

“Teacher can’t provide sufficient time to provide classroom practice because there are more students” – Students

“Teachers use only traditional teaching method (lecture method, teacher center method). If they use learning by doing teaching method students to get some time for practice” -Head teacher

The above view indicates that practice of students played most important role in the learning of anti-derivative concept. Due to home problem of learner, teacher use traditional teaching method, lack of time period of mathematics class, more student in class room, and lack of motivational teaching students not able to more practice of anti-derivative problems.

Student’s Pre- Knowledge

Pre knowledge is the base of the learner. It is the information and educational context a learner already has before they learn new information. Pre knowledge refers to the information no matter how limited a learner has at least start of learning a new topic. The basic knowledge or pre knowledge of lower grade is the key factors to affect the present grade. Pre knowledge is the most important to learning that effect the achievement in mathematics. For this researcher had taken interview to mathematics teacher and students.

Does pre knowledge and skills affect the achievement in mathematics?

“Mathematics is the crafty of creating new knowledge from old using deductive logic and abstraction. Pre knowledge of students play vital role in achievement of mathematics. Most of the students is very weak in mathematics because they have lack of pre knowledge. In this regard students feels mathematics as a very difficult subject” -Mathematics teacher

“It is a government school situated in rural area most of the students come from very weak family background. They are not come in school regularly since primary level. So, most of the students have very weak base in mathematics in this condition how to better result achieved”

- Mathematics Teacher

From above, Most of the teacher viewed a poor situation of pre knowledge of students between past to present time. Most of the students feels difficulty in mathematics because of their pre knowledge.

“Anti-derivative is a completely new chapter for us. We have not any knowledge about derivative, limit and function in previous classes so anti-derivative is a very difficult chapter for us”

-Student

“Teacher did not encourage to us to learn Anti-derivative. They do not give any pre knowledge about related topic before start new topic”-Student

Cognitivist focuses on the inner mental activities -opening the "black box " of the human mind is valuable and necessary for understanding how people learn. Mental processes such as thinking, memory, knowing and problem solving need to be explored knowledge can be seen as schema or symbolic mental constructions. Learning is defined as change in a learner's schema. Piaget confirmed in his interpretation of the learning process on the previous information. Each growth stage depends on learned information from the preceding stage.

The above view indicates that, most of the students don't have pre knowledge and skills related to anti-derivative. Pre knowledge of student play vital role in achievement of mathematics. Teacher not taught according to the required pre knowledge .mathematics teaching is very challenging due to lack of student pre knowledge. Similarly lack of motivation and encouraging to students are not well participated in active learning. Lack of effective concept of derivative, limit and function in previous classes.

Teaching Method and Materials

Teaching materials is essential for make lesson interesting, learning easy and enable teachers to easily express concepts. Learning materials can significant increase learner's achievement by supporting learning. A teaching method comprises the principles and methods used by teacher to enable students learning. The selection and use of teaching method and instructional materials plays a vital role for achievement of mathematics learning. There are various types of teaching methods that can be used in mathematics teaching. By the result of previous research student center, learning by doing, problem solving teaching methods helps to increase mathematics achievement of students but mostly teacher used lecture method, discussion method, and teacher center method. In classroom teacher only use teaching materials like graph paper, geoboard, chalk, duster and text book.

Episode: 1

One day researcher went to school with readiness to take observation. Researcher reached in school at time of praying. All the students standing in ground for pray. Boys and girls were standing separately .all the teacher were involved to arranging the lines of students. One teacher conducted assembly as code language and students performing then. After finishing the assembly one boy and one girl went to stage. They start to sing national song and all the students follow that. At this time all the teachers were also standing in front of student's line of face. After finishing the pray all the students went to own classroom by swinging hard through line. Researcher and all the teacher also went to office room. peor. Rang the bell. In third period researcher and mathematics teacher entered the class room with daily uses materials chalk, duster, and text book. All students stood up and said good morning sir then teacher replied by saying good morning and sir down every body. Teacher said the students we are going to learn exercise 5.6. Teacher did not motivated the student's. Teacher wrote one problem of anti-derivative. Teacher did not check pre-knowledge of students about anti derivative formula. Concept of derivative, concept of limit. There was no any formula cards. Teacher use lecture method there is no student's active in learning. After some time teacher solved 5 problems one by one. In the middle teacher did not ask any problem to students he does not use continuous assessment. In the end of the class teacher wrote one problem in black board for

students but only two students able to solve this problem completely. Finally teacher said process of this problem.

Above class observation indicates that there is lack of effective teaching method and teaching materials. There is lack of motivational teaching, participatory approach between the students and teacher class room, activeness of students and classwork. Teacher did not interrelated with derivative when he touched anti-derivative. Teacher only look on black board. He cannot seen students activities and use lecture method and rote learning.

Use of teaching materials and effective teaching method is the most important to learning that effect the achievement in mathematics. For this researcher had taken interview to mathematics teacher and students.

Does teaching materials and teaching method affect the achievement in mathematics?

“About the homework teacher gives us but they won’t check regularly. If teacher check the homework he never given feedback” -Students

“Teacher use only chalk, duster and text book him never use multimedia, solid materials. Teacher don’t give time in the middle of class for practice problem.”-students

From, above views indicates that there is lack of interaction between students and teacher in anti-derivative teaching .there is lack of effective teaching materials, student center learning. Teacher has not use audio, visual materials as soon as locally availing teaching materials.

“We are not able to use learning by doing teaching method because we have a certain time period. Teaching materials helps effective learning but we are feeling board to use it and here is no teaching materials available in our school. –teacher

“We have not taken formal training about teaching materials and teaching methods”.

–Teacher

Cognitivist theory emphasis on instead memorization as in the traditional classroom methods of learning, cognitive learning focuses on past knowledge. It trains you to reflect on the material and connect it with past knowledge for more robust learning. This is not only makes

cognitive learning a more effective way of gaining knowledge, but it also makes you a better learner for the long term. Cognitivist learning theory focus on student center teaching method, collaborative teaching learning, and insightful learning. Cognitivist focus on insight full learning for the insightful learning perception is essential.

It conclude that the cause of becoming difficulties in teaching learning anti-derivative was teacher applied lecture method, traditional teaching method, lack of effective teaching materials. Lack of well-trained mathematics teacher, lack of interaction between students and teacher, lack of classwork of students.

Teacher Student Interaction

The relationship between students and teacher plays a large role in trajectory of a child's academic success and social development. Establishing a positive relationship with their teacher helps a student more comfortable and safe in their classroom environment. As a result students are more likely to participate actively in class. The student teacher relationship is a cornerstone in a student achievement .the core of education is the relationship between the teacher and students also teacher and students is the essential elements of learning. Teacher student interaction plays a vital role in achievement of mathematics.

Episode: 2

One day researcher went to school with readiness to take observation. Researcher reached in school at time of praying. All the students standing in ground for pray. Boys and girls were standing separately. All the teacher were involved to arranging the lines of students. One teacher conducted assembly as code language and students performing then. After finishing the assembly one boy and one girl went to stage. They start to sing national song and all the students follow that. At this time all the teachers were also standing in front of student's line of face. After finishing the pray all the students went to own classroom by swinging hard through line. Researcher and all the teacher also went to office room. peor. Rang the bell. In third period I along with the teacher entered the classroom. The teacher started solving four-five problems one after another. Only two-three student raised their queries regarding the problems but the rest kept quite during class time .neither students asked questions nor did the teacher motivate them to make queries. They were gossiping but nobody dared to ask questions to their teacher.

“Student’s teacher interaction is essential in effective teaching learning but only four to five students which has good marks in internal exam they are interacted with us” -Teacher

“Teacher don’t interaction with us he has only focus on course of mathematics” -student

“I wish the collage could be not strict in a way that it could allow more freedom to the students they are the students.They have their own thinking so, we have to give them more choice” - Head Teacher

Social constructivism is a sociological theory of knowledge according to which human developed is socially situated and knowledge is constructed through interaction with each other. Knowledge is socially constructed and our culture is foundation of construct knowledge.

Studies have shown that strong relationship between a teacher and his or her students can have a substantial impact on academic success. This can turn classroom into a collaborative environment where students are more willing to listen to both the teacher and each other. Students are more engaged when they have a supportive relationship with the teacher. Above views indicates that relationship between teacher and student impact on educational achievement Lack of collaborative teaching learning, student center teaching learning students less participation on leaning process. They don’t raised a questions with teacher’s .strictness behavior of teacher impact on teacher student interacting.It conclude that there is no strong relationship between teacher and student, only two three students can ask questions in class time and out of class time.

Home Environment

The home and family is the institution the child enters that is to say that the home is a place where the child’s earliest education and socialization begins. What the child learns at home and how his family motivated him towards education contributes to the child success or failure in school. Home is the first school of any child. Parents level of education, parent’s occupation and parents thinking towards education play a vital role on mathematics achievement of students.

The home environment provide the foundation for learning and is an element of the student life that can affect grades. It is obviously that a child academic performance is directly related to his or her environment as well as learning facilities and socio culture issues.

“He has to do all household works after the collage .he has got no suitable environment for study time”- parents

“Most of the students studying here are from poor academic background. Even the guardians are unaware of the importance of education” - Head teacher

“Students do not regularly due to their household works” -Mathematics Teacher

The constructivism theory elaborated that the students had high achievement in mathematics if there is good educational guidance otherwise the achievement would be low. Finally it can be said that the lack of educational guidance at home is another responsible factor for low achievement in mathematics.

The home learning environment is the combination of everything you and your family do and the spaces your child has access to that affect your child’s development and learning. Practice made man perfect anti-derivative is the that kind of chapter student can’t anything without practice but from above views indicates that students don’t get sufficient time at home to do homework and practice of problems due to household. Poor family students get low opportunity for study and illiterate parents are weren’t aware for children study. Parents are illiteracy is one of the major factors and they were unable to teach at home. Lack of weak economic background of students, students have to do household .they don’t have sufficient time for learning. So, that it can say home environment influences the performance level of students.

Class Observation Note

Classroom observation note taking involves the researcher watching and recording student and teacher behavior. It is prepared by researcher in the base of what researcher seen in natural setting observation. For this researcher observed classroom teaching and learning within five days. First of all researcher took permission with head teacher and mathematics teacher. The main purpose of classroom observation was to found cause of difficulties in learning anti-derivative. In this study researcher observe the following areas.

Class Observation Note: I

S.N	Observation Field	Researcher note
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1.	Classroom size	Comfortable for student
2.	Availability of furniture	Sufficient for student
3.	Writing Board	Effective for student
4.	Cleanliness of classroom	Clean classroom
5.	Seat planning	Good seat planning

From, above class observation we can conclude that school have no problems in size of class, seat planning , available furniture , writing board, cleanness of class

Class Observation Note: II

S.N	Observation Field	Researcher Note
1.	Student teacher relation	Lack of student teacher relation
2.	Used polite language	Polite language
3.	Biasness	Few biasness between weak and talent student
4.	Regularity of students	They do not attend regular
5.	Homework and classwork prating	Sometimes homework check but lack of classwork
6.	Motivation of the students	Lack of motivation

From, above class observation we can conclude that school wasproblemson interpersonal relationship between student and teacher. There was some biasness between talent student and

weak student, most of the student are not attend regularly, each day teacher don't check homework of student, lack of classwork and lack of motivational classwork.

Class Observation Note: III

S.N.	Observation Field	Note
1.	Participating in classroom	No students is ready to discuss
2.	Teaching methods	Lecture and problem solving method
3.	Teacher planning	No lesson plan
4.	Guidance of teacher	Lack of guidance of teacher
5.	Student evaluation	Only summative evaluation
6.	Curiosity of the subjects	Weak curiosity

From, above class observation we can conclude that student were not ready for any new topic about anti-derivative. Student and teacher both don't curious about practical use of anti-derivative only solve books problem. Teacher used traditional teaching method, teacher had not planning about her class teaching. Lack of guidance of teacher and there was conduct only summative evaluation.

Chapter: v

FINDINGS, CONCLUSIONS AND IMPLICATION

This chapter is related with findings, conclusion, and recommendation and implication. After the analysis and interpretation of collected data, an attempts has been made to summarize and list the finding, conclusion and some recommendation for further study which are deal separately sections.

Anti-derivative is a function that reverse what the derivative does. One function has many anti-derivative but they all take the form of function plus an arbitrary constant. Most of the students are failed in anti-derivative due to the different difficulty. Similarly, some student have succeeded in it by rote learning but not only well understanding about it. So the researcher intended to study cause of difficulties in anti-derivative. The main objective of this study were to explore the difficulties of students in learning anti-derivative, to analyze the cause of difficulties in learning anti-derivative.

The research was conducted in Shree Bajeswori Higher Secondary School Simta 6, Surkhet. The design of the research was case study. For the conveniences of the study, the researcher selected a public collage of surkhet district. The respondents were five students, mathematics teacher and head teacher of selected teacher. Interview schedule, class observation and test were used as tool for the data collection procedure.

Most of the students are unable to apply the accurate process of the anti-derivative problem. And difficulty on applying of integration by parts rule, concept of power rule and anti-derivative as a reverse process of derivative. Most of the students have difficulty in learning vector geometry and difficulty is due to pre-knowledge of students. Student do not practice anti-derivative at home due to their household work. Lack of interpersonal relationship between teacher and student, lack of effective teaching and lack of effective teaching materials the students learning is reduced day by day.

Findings of the Study

Cause of difficulties in learning anti-derivative were the main concern of this study. The findings of the study on the basis of analysis of the collection information are as follows

- Students have lack of pre-knowledge. (derivative ,function and limit)
- Because of the economic condition and lack of positive concept about the educational of their parents the students are irregular in collage.
- There is lack of teaching materials and teacher cant using teaching materials in mathematics classroom. Also school has not sufficient mathematics materials for teaching anti-derivative.
- There is lack of interpersonal relation between mathematics teacher and students.
- There is a discontinuity between practice of mathematics concept at home and school.
- Lack of active participate, teaching learning process of anti-derivative is not effective.
- Lack of motivational classroom and lack of practice of related problems.
- Teacher used traditional teaching method, lack of student center teaching method, learning by doing teaching method.
- Lack of formal teacher training about teaching materials and teaching method.
- Most of the parents are illiterate and their children are used as the means of earning money for their simple livelihood.
- Due to complex and large syllabus. Teacher have certain time period for finished the course. That's why teaches use traditional teaching approach.

Conclusion:

The major findings of this study shows there were many cause of difficulties. Those cause of difficulties were categorized in the above findings. Many students' difficulties faced on concept of anti-derivative, problem solving approach, integration by parts rule and effective using of power rule due to the lack of pre knowledge of students and another was the traditional

teaching strategies in anti-derivative class by teacher. Teacher were not implementing the modern technology, methods and teaching, materials for anti-derivative teaching and learning. It seems to be exam oriented rather than it's applicable. Due to weak family background of students they have not sufficient time for practice of mathematics. This study shows that Students did not regularly due to their household works. Interaction is the foundation of construct knowledge. Lack of interaction between teacher and students. Students could not more comfortable in teaching learning process.

I conclude that students can learn anti derivative easily when teacher uses effective teaching materials and teaching method, giving pre knowledge before start new topic, keep positive relationship with students and family giving motivational support and academic support to her child.

Educational Implications

Before starting the chapter teacher should have given fundamental concept of anti-derivative which makes study ready to selecting way to solve the problem. The conceptual clearness increases student's participation in learning and actively interact the classes. Teacher should use new techniques for easy anti-derivative learning.

- Teacher should give pre-knowledge and other chapter relation before starting new topic.
- Teacher should be encourage for making and using the teaching materials.
- The teacher shouldn't make students only busy copy the solved problems from blackboard check them whether they are comprehending or not.
- The school administration should interact to the students, teacher guardians and other related persons to discuss the problems and come to the solution.
- Teacher should conduct diagnostic assessment, collaborative learning and student center teaching learning.
- Teacher should motivate the weak students and praise them to participate in teaching learning activities.
- Knowledge is constructed by community so, home environment of learners effect on mathematics achievement of learners.

Recommendations

This research is not complete research .there is a limitations of the research .In the research point of view, suggested for further study which provides the better mathematical learning activities and comfortable techniques for learning mathematics. The following suggestion could be beneficial for further study.

- This study was only in Bageswori Higher Secondary School Simta 6 Surkhet as a case for the generalization of result of the study similar study should be done in large samples.
- The study of these kinds should be conducted at all levels of school and collage as well as other subject.
- It can be help full to explore learning difficulties in other special group of community.
- Similar study can be carried out in private school.
- Similar study can be de carried out for different branches of mathematics.
- Further study can be done on “factor affecting anti-derivative achievement at class twelve.

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Appendix –A

Interview schedule with student

(Guidance of researcher)

School name and location ...

Types of school.....

Name Class.....

Roll no

Position in class..... Sitting position in the class.....

Gender

Most interesting subject Least interesting subject.....

Family status (About education)..... parents education.....

Focus points of interview

- Teacher and student behavior
- Learning environment of classroom
- Classwork and homework
- Teaching methods (discovery, problem solving method, child center, teacher center)
- Pre-knowledge and understanding of students in learning anti-derivative.
- Faced difficulties in learning anti-derivative
- Relation of mathematics teacher and student's

APPENDIX- B

Interview Schedule with Mathematics Teacher

(Guidelines to Teacher)

Name..... Age.....

Gender..... Religion.....

Cast/ Ethnicity Qualification.....

Teaching Subject..... Teaching Experience.....

Tranning..... E

Focuses points of interview:

- Lesson plan, teaching strategies, materials for teaching learning anti-derivative.
- Requirement of pre-knowledge of students for learning anti-derivative.
- Encouragement and motivation in Anti-derivative class.
- Classwork and homework
- Reinforcement, feedback provided by mathematics teacher to students in anti-derivative class.
- Teacher and students behavior on learning anti-derivative.
- Relation of mathematics teacher with student.
- Learning environment of classroom.
- Strategies, activities of teacher while teaching anti-derivative.

APPENDIX-C**Interview Schedule with Headmaster**

School's Name and Location:

Types of school: a. Government () b. Private ()

Name: Age:

Gender: Religion:

Caste/ Ethnicity: Qualification:

Teaching as Headmaster:

Focus point of interview:

- Physical facility of school
- Instructional Strategies. (method, plan, material)
- Management of school administration committee.
- Learning environment
- Seminar conferences and training to mathematical as teacher.
- Public image towards school, parental involvement in school.

APPENDIX- E

Class observation Note

The Classroom observation note will be prepared on the basis of following indicators being participated with mathematics Teacher during teaching learning in Anti-derivative.

S.N	Observation field	Researcher note
1.	Student teacher relation	
2.	Used polite language	
3.	biasness	
4.	Regularity of students	
5.	Homework and classwork prating	
6.	Motivation of the students	
7.	Classroom size	
8.	Availability of furniture	
9.	Writing Board	
10.	Cleanliness of classroom	
11.	Seat planning	
12.	Participating in classroom	
13.	Teaching methods	
14.	Teacher planning	
15.	Guidance of teacher	
16.	Student evaluation	
17.	Curiosity of the subjects	

APPENDIX- D

Group-A

Objective question

Q. what is the Anti-derivative of function x^{10} ?

- i) x^9 ii) $x^{11}+0$ iii) $x^{11} +c$ iv) x^9+c

Q. which is the best answer about anti-derivative?

- i) no relationship between derivative and anti-derivative ii) anti-derivative as the reverse process of derivative iii) derivative and anti-derivative are same concept

Q. if $\frac{d}{dx}x^3 + 3 = 3x^2$ then what is the anti-derivative of function $3x^2$?

- i) $x^4 + 3$ ii) $3x^4$ iii) x^3+3 iv) $x^3 +c$

Q. What is the anti-derivative of function x^{-3} ?

- i) $\frac{x^4}{4} + c$ ii) $\frac{x^{-4}}{-4} + c$ iii) $x^{-4} +c$ iv) $\frac{x^{-2}}{-2} +c$

Q. What is the Anti-derivative of function \sqrt{x} ?

- i) $\frac{1}{2}x^{3/2}+c$ ii) $\frac{2}{3}x^{3/2} + c$ iii) 0 iv) $\frac{1}{3}x^{1/3} + c$

Group-B**Subjective Question**

Q. Find the Anti- derivative of the given function:

i) $\frac{3x^5+5x^3-2}{x^2}$ ii) $\frac{1}{\sqrt{x+a} + \sqrt{x+b}}$

Q. Evaluate by using Integration by parts rule:

i) $\int e^x x dx$ ii) $\int \sin x \cdot 4x dx$

Q. Evaluate by using power rule:

i) $\int \frac{5}{\sqrt{x^2}} dx$ ii) $\int (3 - 4x)^5 dx$

Q. Evaluate by using substitution method.

i) $\int (x^2 - 5)^7 x^3 dx$ ii) $\int \frac{x+1}{x^2+2x} dx$