EFFECTIVENESS OF DOTELI LANGUAGE ON STUDENTS ACHIVEMENT IN MATHEMATICS

A

THESIS

BY

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IN THE PARTIAL FULFILMENT OF THE REQUIRMENTES FOR THE DEGREE OF MASTER'S DEGREE IN MATHEMATICS EDUCATION

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RECOMMENDATION FOR ACCEPTANCE

This is to certify that Mr. Hari Prasad Bhatt has completed his M. Ed. thesis entitled **' Effectiveness of Doteli Language on Students Achievement in Mathematics '** under my supervision during the period prescribed the rules and regulations of Tribhuvan University, Kirtipur, Kathmandu, Nepal. I recommended and forward his thesis to the Department of Mathematics Education to organize final viva-voce.

…….

(Mrs. Hom Kumari Adhikari)

Supervisor

August, 2019

LETTER OF APPROVAL

This thesis entitled **'Effectiveness of Doteli Language on Students Achievement in Mathematics '** submitted by Mr. Hari Prasad Bhatta in partial fulfillment of the requirements for the Master's Degree in Education has been approved.

Viva Voce Committee	**Signature**
Assoc. Prof. Laxmi Narayan Yadav (Chairman)	……..…….
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Mrs. Hom Kumari Adhikari (Member)	……..…….

September, 2019

LETTER OF CERTIFICATE

This is to certify that Mr. Hari Prasad Bhatta, a student of academic year 2072/073 with Exam Roll Number 7228286, Thesis number 1431 and T.U. registration number 9-2-605-42-2010 has completed this thesis for the period prescribed by the rules and regulations of Tribhuvan University, Nepal. This thesis entitled **'Effectiveness of Doteli Language on Students Achievement in Mathematics '** has been prepared based on the results of his investigation. I, hereby recommend and forward that his thesis be submitted for the evaluation as the partial requirements to award the degree of Master of Education.

…….

Assoc. Prof. Laxmi Narayan Yadav

(Head)

August, 2019

Defence Date:

DEDICATION

To my respect and the dearest parents Pusp Raj Bhatta and Dammari Devi Bhatta

DECLARATION

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

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Hari Prasad Bhatta

August, 2019

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Finally special heart thanks, go to my dear friends and my family member and relatives for love, support and guidance in my study.

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Hari Prasad Bhatta

ABSTRACT

This study entitled with Effectiveness of Doteli language on students Achievement in Mathematics is intended to find out the effect of Doteli language in teaching mathematics of grade IV students. The main objective of this study were to compare the achievement score of the students taught by using Doteli language and with that of Nepali language and to analyze the effect of Doteli language in achievement level of students.

This research was quasi-experimental design. To fulfill the objective of this study, the researcher adopted experimental, pre-test post-test non-equivalent group design. For achievement test two set of questions were prepared for pre-test and post-test. In the same way for three weeks experimental period researcher prepared and validate episode for each period. For the design of this study quasi-experiment, the researcher selected Ghante shwar Secondary School and Ratna Basic School from Jorayal Gaupalika Dotei district. By the coin toss method Ghante shwar Secondary School selected for experimental and Ratna Basic School was selected for control group. There were 18 students in experimental group and 20 students were in control group.

The main tools of this study were achievement test and teaching episode for instrument. Mean, standard deviation, variance and t-test were used as a statistical tools to analyze the data. The difference in mean achievement score were tested by using t-test at the 0.05 level of significance. By testing found that there is significance difference between the achievement score of students taught by using Doteli language and Nepali language. It was concluded that the use of Doteli language in teaching is more effective than Nepali language in teaching mathematics.

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Introduction

Background of the Study

Every child has their mother tongue language which is learnt in their society. Mother tongue or mother language refers to a child's first language which is learnt in the home from older family members. The language which a person acquires in early year and which normally becomes his natural instrument of thought and communication has given description of mother tongue. UNESCO (2007) has given description of mother tongue as the language: One has learnt first, One identities with on is identified as native speaker of by other, One known best and One uses most

Teaching mathematics inside the classroom is a unique challenge to all mathematics educators. We all know that classroom is the representative body of our society. Where we can find the children of different language, culture and civilization and also we can find children having different learning abilities inside of the classroom. In mathematics classroom language is used as a communication. So improper language skill makes mathematics learning difficult. In mathematics class room students need language to understand teacher activities to understand the content given in textbook and to understand the meaning of given question and to respond on a given question so peer communication and collaboration language is need.

According to the census (2011) Nepal is the multi culture and Multi language country. Every child has their own mother tongue language which is learnt in their society and family. Mother tongue refers to a child first language which is learnt at home. Every child though his idea of mother tongue that every human being first learns to formulate and express about him and about the world in which live.

The use of mother tongue as a medium of instruction, especially in school in the rural areas will be of great benefit to the rural pupil. The use of mother tongue language that children understand allows teacher to use more active and effective teaching method as well as instructional materials. It promotes the cognitive development where as it ensure that the knowledge children bring to the school is used as a basis for further learning. Nepal is the multilingual country but the class runs in the Nepali language where as local language is Doteli, the student cannot get understand clearly, in this context, the constitution of Nepal (1990) says "Every community can operate school in the mother tongue of that community to educate school age children."

In our country 61ethnic groups out of 125 caste census (2011) and Doteli is the one of them. Doteli is an Indo-Aryan language spoken by about 8 00,000 people must of whom live on Nepal census (2011). It was traditionally considered the far-western dialect of Nepal and is written in the Devanagari script. Doteli language must be used in Doti, Dadeldhura, Baitadi, Bajhang, Darchula, Bajura, and Achham also.

Doteli language belongs to group of language usually called the Indo-Aryan family. Doteli is major living language spoken mainly in far-western part of Nepal. The history of Nepal (2003) says that Doteli dialect is closer to the original birth place of Nepal language namely Karnali zone, Sinjali was the dialect of that are whish was the oldest form of the Nepali language. The more language users of particular language the more chance of its verities the verities of language are known as dialects. Nepal has many verities Doteli is one of them. The dialectical study records that there are more dialectical variations in the western part of Nepal than those of the east part of Nepal. Doteli is the spoken in far-western region and also some part of India. Bohara (2010) fond that the achievement score if the mathematics when taught by

Doteli language higher than the achievement score of taught by Nepali language and he found that gender wise achievement score of mathematics taught by Doteli language higher than taught by Nepali language. By another research we can say that the mathematics achievement of students who were taught by mother tongue language were having high score so mathematics achievement and mother tongue language is strong relation. Another researcher Stephanie R Eichentof (2014) did a research "a sociolinguistic study of Doteli" and found that the language attitudes of the identified Doteli varieties towards one another to better understand their willingness to share real and written materials.

Statement of the Problem

In the far-western part of Nepal many people speak Doteli language and children also speak at school in their mother tongue language but the teacher coming from the different community who teach in Nepali language. Then student feel difficult to learn mathematics they cannot understand the concept of mathematics due to language problems which create great issues in teaching and learning mathematics. In Doti district many children speak Doteli language but they have to learn mathematics in Nepali language at school so students feel difficult in learning mathematics. The researcher have two years teaching experience in basic level in Doti district. At that time I found that Doteli students can't understand the Nepali language clearly. When I taught Nepali language they are confused in lesson so I used in Doteli language in teaching mathematics. In this situation I think language is the grate problem in learning mathematics Doteli students. Also researcher as a Dotelian and mathematics as a specific subject so I want study on basic of this topic. "Effectiveness of Doteli language on student achievement in mathematics."

The aim of this research is to find out the answer of the following question:

- How does mother tongue language effect Doteli student's achievement in mathematics?
- Does students feel enjoy teaching in their own language?
- What is the parents view in teach their children in Doteli language?

Objectives of the Study

Objectives of the study playing important role of in any study and it is designed on the basis of the research questions. The objectives of the study were as follows:

- To compare achievement score of the students on mathematics taught by using Doteli language with that of Nepali language.
- To analyze the students view in teaching mathematics by using Doteli language.
- To explore the parents view towards teaching mathematics by using Doteli language.

Significance of the Study

Mathematics an essential and widely used subject of school curriculum, so every student should study. Every teacher should teach mathematics with effective way for developing mathematical concept. Mathematics has been taught for all pupils as a compulsory subject at school as well as optional subject.

Nepal is the multilingu al, multicultural and multi religions country. Our country will not be prosperous unit the people of the country are properly educated. Also the students of the secondary level come from different communities and they are ma or may not be able to understand Nepali language. In such a situation the teacher should teach mathematics in their own mother tongue to achievement. So the importance of this study cannot be neglected so the study has following significance

- This study would inform mathematics teachers about the achievement level of students by using effective medium of instruction.

- This study would help to the government to make a policy about teaching mathematics using Doteli language.
- The study would be helpful for further researcher.

Hypothesis of the Study

Hypothesis can be considered as tentative generalizations about the problems under the investigation. It is an assumption or proposition whose probably is to be tested on the basis of the compatibility of its implication with empirical evidence and with pervious knowledge. Hypothesis provides the researcher and prevent review of irrelevant literature and the collection of useless or excess data.

Statistical hypothesis of the study. The main achievement score of the students taught by using Doteli language and Nepali language. The research hypothesis formulate for the study were as follows:

- H_0: μ_1=μ_2(Null hypothesis)
- H_0:$\mu_1 \neq \mu_2$ (Alternative hypothesis)

where $\mu_1$and $\mu_2$are the mean achievement score of the student of pre-test of taught mathematics by using Doteli language and Nepali language respectively.

- H_0 : μ_3=μ_4 (Null hypothesis)
- H_0 : μ_3≠μ_4 (Alternative hypothesis)

where μ_3 and μ_4 are the mean achievement scores of the students of post-test of taught by using Doteli language and Nepali language respectively.

Delimitation of the Study

The study was limited within following aspects:

- This study was limited to two public school in Jorayal Gaupalika of Doti district.
- This study was limited to Grade IV only.

- This study was conducted in the subject of mathematics only.
- Sampling of the study was limited to selected Doteli students at Ghante shwar Secondary School and Ratna basic school.

- The data analysis of this study is limited in mean, standard deviation and t-test only.
- This study is limited to 38 students from selected school.

Definition of the Terms

Definition of the terms is usually annex to a work either at the beginning or more likely near the end with a list of acronyms, jargon credits etc. this is an important part of research paper or report is that in which the key or important terms in the study are clearly designed.

Basic level. The grade from class I to class VIII in the school system of Nepal are basic level.

Achievement. Achievement refers to score obtained by the students on the achievement test paper designed by researcher.

Public school. Public school are those school which are conducted by government.

Doteli language. Language, that on the first learns to speak a child one native language. It is one of the varieties of the Nepali language which is spoken in the far western region of Nepal.

Control group. Group of students who were taught mathematics by Nepali language.

Experimental group. Group of students who were taught mathematics by using Doteli language.

Parents. Parents whose children study in grade IV in sample School, Jorayal, Doti.

Mother tongue. The language which a person acquires in early which normally becomes his natural instrument of thought and communication.

Chapter II

Review of Related Literature

The main purpose of review of related literature was found what work have been done and what work has not been done in the area of study being under taken. It also describes theoretical basis for the research and helps to determine the nature of my research. There had been studied about review related literature and framework for the study. Theoretical literature describes learning theories on mathematics. That helping to construct the framework to achieve the objectives of my study. It is an essential aspect of a research project and this work is basically undertaken for the purpose of documenting the research finding drawn by the different research. Such a review represents the third steps of the scientific method outlined by away and other educational philosophers. But here review of related literature is explained in steps of this study.

Empirical Literature

Empirical research is research using empirical evidence. It is a way of direct and indirect observation or experience. Empirical evidence can be analyzed quantitatively or qualitatively. Empirical literature review deals with original research (such as scientific experiments, surveys and research studies). They are researches based on experience and observation, rather than on systematic logic. The empirical review is simply talking about the various researchers concerning your topic or peoples research works that are similar to your research work.

Rijal (2008) did a research work on the title “The difficult in mathematics of Rana Tharu student’s at lower secondary level” with objectives to identify the difficult and causes of difficulties in learning mathematics of Rana Tharu student’s. The study was qualitative design descriptive nature. The researcher collection of data

from interview, observation and related published and unpublished document. Only five children of Rana Tharu were selected from grade VI students with purposive sampling techniques. Then found that there are two vital factor in mathematics learning on is language dominance and other is cultural different and discountinuity.

Giri (2016) conducted a qualitative 'ethnography' research on "problems faced by teacher and students in multicultural class room." Sindhupalchok district were selected for the purpose of carrying out. The researcher was selected tow schools shree Janaseb higher secobdary and shree Baghbhairab higher secondary school for the study and two mathematics teacher and six students were the sample of the study were selected by purposive sampling method. Data collection tool was observation from and interview formats. Then found that language is the major factor for creating the learning difficult for some students. Must of school don't have sufficient teaching materials so it is also create a difficult of teaching and learning in mathematics in multicultural classrooms. Communication problem is the main problem in mathematics classrooms.

Carroll (1961) conducted a study on "English as a medium of instruction" in Ghana. He found that difference between pupils studying in their mother tongue and those learning a foreign language had increase rather than decrease in the course of time. In this study, children were tests of their vocabulary in the vernacular and in English. The result of this testes showed the vernacular vocabulary is consistency far in advance of the English and is ready for normal classroom use. The result suggested that the English vocabulary of the children leaving the primary school at 12 is rather then their vernacular vocabulary of English children leaving infant school.

Yadav (2010) carried out of research of "effectiveness of Bojpuri language on mathematics achievement of grade VI." Researcher used experimental method in this

study. 60 students of class six studying at the Shree Jay kisan higher secondary school, Dharahari were selected for the purpose of carry out experimental group and also 60 students of class six studying at the Shree Janta lower secondary school, Gonahi for the purpose of control group. The researcher cores were analyzed by using z-test with 0.05 level of significance. He concluded that study on achievement test was that the students taught by Bojpuri language in mathematics performed are better than the students taught by Nepali language.

Guragai (2016) did an qualitative research on "Exploring language difficulties in learning mathematics" which was amide to find the language difficult of the students and also analyzed the effect of language difficulties in mathematics learning. The researcher selected four schools in Kirtipur municipality for the study. He selected 28 students (7 from each school) and questionnaire, observation form, clinical interview data collection tools were used for achievement of objectives. The researcher found that students feel difficult mathematical terms, sign, symbol and their uses.

Bohara (2010) did an experimental research on "effectiveness of Doteli language in learning mathematics at primary level." The researcher selected Shree Kheti higher secondary school, Talladehi Baitadi district In 60 student's grade three. The researcher taught the selected unites of mathematics to the both group experimental group and control group. After then analysis and interpretation of the data, the researcher concluded the data achievement of grade three students of mathematics when taught with Doteli language as the medium of classroom instruction is significantly higher than the students taught in Nepali language and also found boys and girls experimental group were found higher than boys and girls control group respectively.

Bhusal (2000) conducted an experimental research on "A study on the effectiveness of mother tongue in teaching mathematics of primary level." The researcher selected 54 students of Shree Janta Secondary school of Kailali district. The students were only Tharus. True experimental design post-test only, equivalent control group design was adopted. The researcher taught the selected units of mathematics to both the groups experimental and control groups. After analysis and interpretation of the data, the researcher conclude that that achievement of first grade students in mathematics when taught with their own mother tongue as the medium of classroom instruction is significantly higher than the students taught in Nepali language.

Lama (2017) did an experimental research work in the title "Effectiveness of Tamang language in teaching at primary level." With objective to find out the effectiveness of Tamang language in learning mathematics in primary level and participation of the students in the class room while teaching their mother tongue. The researcher selected 32 Tamang students in Phaparbari V.D.C Bhairav lower secondary school. The researcher made two group by their odd and even number with the help of coin toss. After analysis and interpretation of the data the researcher conclude that achievement score of post-test in mathematics in of experimental group was found higher than control group. The students in experimental group feel pleasure and excited then they were curious and highly interested than the students of control group.

Smith (2017) did an quasi-experimental research on "The influence of language on teaching and learning mathematics." The sample of the study was a year-round multidisciplinary college located in Pasely, Protland, Jamaica. The focus of this study was consisted with the goal of the ministry of Education in Jamaica for

improving the teaching to mathematics to Freshmen education students. In this study 40 students consented to participate in the study, therefore 20 students were randomly assigned to the treatment and control groups respectively. The researcher used t-test data analyses and the researcher fin out the significant difference in the academic performance of the SE students and that were instructed using the JD (Jamican dialect). Also researcher found out the achievement test was that the taught by JD mathematics performed were better than the students taught by SE (Standard English).

Above study encourages the teacher's efficient involvement in the teaching mathematics by suitable mother tongue also encourage to develop the basis level books in mother tongue language. Therefore this study seems highly necessary in order to have improvement in the teaching mathematics. So the researcher had decided to study on this field because it would be very helpful for those people who are interested in this domain. The above study were focus in achievement score of mathematics taught by mother tongue language but not focus in present time students feeling and parents view in mother tongue language used in basis level. In my study focused in achievement when we taught by mother tongue language in basic level and also focus in students feeling and parents view while teaching mathematics in their mother tongue language. The major finding and conclusion of this research found that the mean achievement score of students taught with using mother tongue is higher than the mean achievement score of students taught without using mother tongue.

Theoretical Literature

The purpose of this from is to examine the corpus of theory that has accumulated in regard to an issue, concept, theory, phenomena. The theoretical literature review helps to establish what theories already exist, the relationship between them, to what degree the existing theories have been investigated, and to

develop new hypothesis to be tested (google). Often this form is used to help establish a lack of appropriate theories or reveal that current theories are inadequate for explain new or emerging research problems. The unit of analysis can focus on a theoretical concept or a whole theory or framework

Vygotsky's Sociocultural Theory

Vygotsky's sociocultural theoretical framework guided this study. Mathematics educators are concerned about how poor language skills are preventing students from learning mathematics effectively. According to Dahower (2013), "sociocultural theory operates on the assumption that human cognitive development in highly development upon the social context within which it place." Vygotsky (1962, 1978) noted that "Development occurs at the result of meaning verbal interaction between novices and more knowledgeable interlocutors such as parents, teacher" (as cited by Darhower 2013). Closely linked to the Vygotskian view of cognitive development in the concept of shared view. Darhower (2013) suggested that "Engaging in the collaborative discourse requires a shared communicative context." Speakers who have the same kind of experiences and social circumstance can readily share their lived experiences. Outcomes are easier to interpret using sociocultural theory because such as perspective reflects the effect of language and related to socioeconomic, cultural and pedagogical elements that affect the lives of students and instructor (Darhower, 2013). In the research, I used a sociocultural theoretical framework to investigate social and cultural circumstance a how language influences mathematics.

Herry and Balets (2014) have shown that language effect the teaching and learning of mathematics sociocultural theory encourages the teaching of mathematics around student's cultural identities, Which makes mathematics accessible to those who have traditionally had difficulty learning the subject. If math reform in Nepal and

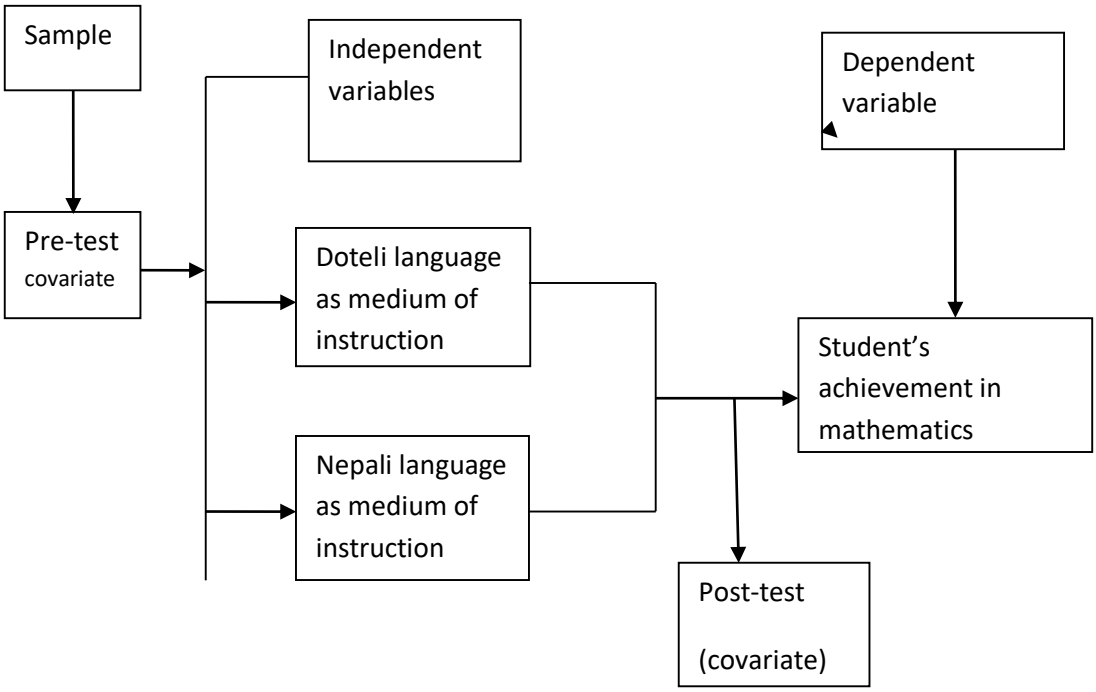
other jurisdictions are to benefit students who students who are linguistically and politically different from the majority, researcher should be carried out that assist in understanding the relationship between human communication and mathematics language. I combined current view of mathematics scholarship with current thanking on how to use classroom communication mastery in more than two language and written or spoken communication about instructors experience while teaching mother tongue language. If there language challenges are not removed, it is uniquely that teachers will be able to full grasp the concepts taught on math lesson. Vygotsky's sociocultural theory suggested that the acquisition of knowledge or skill occurs with social communication and comprehension is the result of socialization (Florentino, 2014). The purpose of this researcher study was to determine the effect of the language instruction has on student's achievement in mathematics. Vygotsky's sociocultural theory, which highlights the need to incorporate the language of students into the instruction of mathematics, guided the study.

Conceptual Framework

A conceptual framework is much more than a literature review and it is also finalized the thesis. This framework depends up on the fulfillment on the objectives of the research. By conceptual frame work methodology and analysis of the data would be derived.

Learning is run between intra and interpersonal relationship so I intended to learn how mother tongue facilitate in learning the mathematics at basic level students who initially enter the school from their community. The education which is given on the basis of society is succeed and long life sustained. During this study I am keen interested to know how mother tongue language Doteli interlinked with the mathematics learning at basic level. Conceptual framework takes into consideration all current theories, finding and context for your research question. A complete

conceptual framework will help you to assist the goal of our own research and develop appropriate research question and methodology. The diagrammatic representation of the conceptual framework is presented below:



The above figure represents conceptual framework of my study and shows that way to meet my research objectives. First, sample are selected out of total students from the selected schools and pre achievement test is conducted before checking the test paper, group is divided by Experimental and control group are decided by tossing coin. Experimental and control group are taught in Doteli and Nepali language respectively. Then achievement test II were conducted at the end of experimental with observation to motto of my research.

Chapter III

Methods and Procedures

Chapter three would be presents the methodology used to seek solutions to the problem and questions under study. This chapter explain the research design, process of data collection, consists of a sampling procedure methods and instruments, collecting procedure of data and analysis procedure. Research methodology is a science, which determines how the research becomes complete and systematic. This chapter deals with how the methodology of study was determined, how the sampling of study was done, how the data collection, instrument were develop, how the instrument were administered to the target group. It also present how the collected information was translated into meaningful statistics.

Design of the Study

The design of the study was a quasi-experimental design. An experimental is a scientific investigation in which the researcher manipulates one or more independent variables, control any other relevant variables, and observes the effect of the manipulation on the dependent variable. Creswell (2012) noted that when researcher use similar instruments for both pre-test and post-test, they minimize instrumentation threats. Using a quasi-experimental design, I was able to examine the change between the pre-test and post- test score of the experimental group and control group. To determine whether difference between the two groups was statistically significant. Mainly this study is experimental pre-test and post-test equivalent design because I selected same based or knowledge students in which is based on quantitative approach. This was an experimental research builds on descriptive data that had been collected in the field. The study was specially focused in the student achievement by teaching Doteli language and also students feeling and parents view with teaching

mother tongue language. The experimental group was taught a lesson of mathematics by Doteli language and control group was taught a lesson of mathematics by Nepali language. The design of the study was depends under the group with Doteli language and Nepali language which were as follows:

Table: 1 Pre-test Post-test

Group	Pre-test	Treatment	Post-test
E_R	E_1	×	E_2
C_R	C_1		C_2

E_R- Experimental Group

C_R- Control group

E_1- Pre-test experimental group

C_1- Pre-test control group

E_2- Post-test experimental group

C_2- Post-test control group

Here, E_R and C_R represented an Experimental and Control group respectively. According to the table E_1 denoted the mean score of Pre-test experimental group. E_2 denoted the mean score of post-test experimental group and C_1 denoted the mean score of Pre-test of control group and C_2 denoted the mean score of post-test of control group.

Impact group

The impact group of the study consist all Doteli language students of grade IV of Jorayal Gaupalika in Doti district. The sample of this study was including to school in Jorayal Doti. For the sample of the study at first the different four schools were selected for the pre-test, Ghante shwar Secondary School, Shibapur Secondary

school, Rtna Basic School and Jagatmba basic school, in Jorayal Gaupalika in Dotei district by convenience sampling and then I were selected two schools which has mean value is nearly each other. After then I made two groups experimental group and control group with the help of coin toss Ghante shwar Secondary School was selected for experimental group and Ratna Basic School selected for control group. There are 18 students in experimental group and 20 students in control group. Also I selected two parents and two students from the experimental group for the interview by purposive sampling.

Variables of the Study

The main aim of my study was find the effect of independent variable "Doteli language" and achievement test was dependent variables. So in this study some non-experimental variables such as history, mortality, subject matter, evaluation, teacher, teaching matter, length of experimental etc.

Control mechanism of extraneous variables. Different variables were controlled by the following ways:

Teaching method: A researcher used same teaching method for both group but medium of instruction was different.

Teaching time**:** A researcher devoted equal time duration (40 min) to teach both experimental and control group.

Subject matter**:** Same lessons were taught by both groups.

Evaluation**:** *Parallel types* question asked the students on pre-test and post-test.

Teacher variable*:* Researcher myself taught both experimental and control group.

Phases of Experiment

Without stage of any experiment there is not completeness in experiment so any experiment has to have stages. Therefore my study also has own stage and it

experiment was performed in three stages: Pre-experimental, Experimental and Post-experimental stages which are presented below.

Pre-Experimental phase. Firstly researcher conduct the pilot –test in shree malika secondary school after then researcher were selected different four school for the pre-test, Ghante shwar secondary school, Shibapur secondary school, Rtna basic school and Jagatmba basic school, in Jorayal Gaupalika in Dotei district by convenience sampling. The mean valve of the pre-test has 10.88, 13.51, 10.40 and 7.25 respectively. After then I were selected two schools which has mean 10.88 and 10.44. After then I made a two group experimental group and control group with the help of coin toss Ghante shwar Secondary School was selected for experimental group and Ratna Basic School selected for control group. There are 18 students in experimental group and 20 students in control group.

In this stage teaching material would collected and teaching episodes were prepared, researcher followed the teacher guide and took help the subject teacher. The selecting school were similar status with respect to physical facilities, academic achievement, class size, teacher's qualification and experience for experimental and control group.

Experimental phase. In this stage, I conducted teaching both group with the same 14 lesson plan and experimental group was taught by Doteli language and control group was taught by Nepali language. But in this phase different type of extraneous variables can effect of the independent variables, researcher controlled some variables testing effect, time interval and statistical regression, taught to both experimental and control group the same curriculum, same time duration.

Post-Experimental phase. It is the ending stage of the study. In this stage, first the researcher prepared post-test achievement. At the end of teaching post test

was prepared of question from selected topic mentioned above and administered to the both group of the sample student. The time allocated the test 1 hour to each group. After that researcher would be collect the data for analysis and interpretation by using statistical tools and technique.

Tools of Data Collection

An achievement test prepared by the researcher was the main instruments of collecting data for this study, which was the type of instrument to be used depending upon the objective of the study. I would apply following tools and technique for the data collection:

Construction of the achievement test. An achievement test was the main tool for the data collection of this study. The researcher developed the pre-test question on the basis of grade IV it contains 18 items. Among them 10 of 1mark 5 items are 2 marks 2 items are 3 marks and 1 items are 4 marks. All the questions were selected from the unit which was already taught in previous class of grade IV which is given in appendix “A and B”. For the post-test for the selection of teaching chapter geometry and algebra then teaching episodes see in Appendix “M” it contain 18 questions among them10 of 1mark 5 items are 2 marks 2 items are 3 marks and 1 items are 4 marks which is see in Appendix “C and D”. The researcher according to teacher's guide and specification grid of grade IV. For the selection of with the help of mathematics teachers of this class for both pre-test and post-test questions.

Interview Schedule. Unstructured interview were taken with the help of interview guideline on selected two students from experimental group but related to felling of (difficult/easy) when you learned mathematics in Doteli language and Also, I were take unstructured interview with the help of interview guideline on selected

two parents in experimental group students with related to teaching medium of Doteli language in basic level.

Selection of the Teaching Episode

In this study, researcher developed 14 teaching episodes. As per the teaching period referred by course of study, the selected topic had contained only 14 periods. So that, the researcher constructed only 14 lesson plans. The lesson were constructed on the basis of mathematics curriculum of grade IV by addressing the suggestions by the experts. The constructed episodes were finalized for teaching with the help of subject teacher.

Item analysis

In item analysis, the difficulty level (P-value) and discrimination index (D-value) of the test was computed to check the quality of the test item. Test item were analyzed to examine their power to separate the more form less capable students in performing the test task. This was done by calculating the response of the 27 percent of students who scored high and 27 percent of students who scored low. Hence the researcher took five upper and five lower scores students. A test item is said to be good if it is correctly done by the top students and not by the bottom students. This is show a test item discriminates from more to less capable students. The calculation of discrimination (D-value) of the test item was done on the basis of this kind of analysis. The table of item analysis obtained the level of difficulty (P-value) and index of discrimination (D-value) of each item, only these items were selected whose P-value was ranking between 30% -70% and D-value was ranking between 0.20 - 0.80, the other items were rejected. The split half reliability was found scoring 1for correct response and 0 for incorrect response on each items. Difficult level of p-value is percentage of students able to pass each items. It takes the value of ranking from the 0

to 100 on the basis of criteria given in appendix “E” where 5,10,15 items was rejected from test and were prepared the test.

Reliability and validity of tools

Reliability is the degree to which consistently measure whatever it measure. To established the reliability, pilot test was made to 15 students of grade IV of Shree Malika basic school Jorayal Doti. The measure interval consistency the researcher used split-half method of this test. The correlation of this test using karl-Pearson's coefficient of correlation technique was 0.92 given in appendix “H”. So it was indicated that achievement test was highly reliable.

Validity is a degree to which a test measure what it is supposed to measure. To maintain the content validity for this test the researcher used curriculum, textbook, specification chart and teacher guide when established achievement-test paper. Then after preparing the question, researcher share with subject expert, subject teacher and supervisor. By the help and discussion of the related person researcher reform the question and prepare for the final test.

Data Collection Procedure

Data collection is the most important work in the research. I prior to ministration of achievement test, the researcher met the headmaster, subject teacher and took permission for the test. I made a standardized test time duration to the both group one hour. After examination the answer sheet were collected and scored by me then the tabulate for analysis. Pilot study was adapted to established validity and reliability of the test item. I were divided the selected sample into two non-equivalent groups. I taught both the experimental and control groups separately three weeks (2075-11-05 to 2075-11-29) in two selected school (Ghante shwar Secondary School and Ratna Basic School) in Jorayal Gaupalika, Doti district. For experimental stage

researcher would selected two different school taught by one for using Doteli language and another for taught Nepali language in mathematics. In this period researcher made episode for teaching. After finish the experimental stage the researcher the conducted the post-test as same as the pre-test design. Then collected the data and prepare for the data analysis steps. In the quantitative data, some qualitative information was taken in relation to students' progress while conducting actual classroom teaching. After the standardization of the test, the collection of data from achievement test was done.

For the qualitative data, I were take an interview with students (learning difficult), checked daily notes, participation, performance, homework, discussion, student's regularity etc. and also I were take an interview about appropriateness of teaching in mother tongue language with parents of experimental group students.

Data Analysis Procedure

The collected set of data was analyzed and interpreted statistically. Descriptive statistics such as mean, standard deviation and variance were calculated for both experimental and control group with the view to give firsthand information about the status of these groups before and after the experimental and the collected data was presented. Related mean achievement was the compared by using t-test at 5% level of significance. For the qualitative analysis, collected information from the interview with students and parents was analyzed in descriptive way. I used the following statically procedure to analyzed the obtained data. Mean, standard deviation and variance were calculate for the both group with their secured marks in the test. t-test was used 0.05 level of significance to find where the difference of mean is statically significance or not by using the method by pooled variance formula.

For the second and third objectives, researcher used interview guideline to find the students and parents view using Doteli language in teaching mathematics. The information collected by interview and analyzed by descriptive way.

Chapter IV

Analysis and Interpretation

This was quasi-experimental study to the effectiveness of Doteli language as medium of teaching mathematic at basic level of sample school "Ghante shwar Secondary School and Ratn Basic School" represented to Doti district. The objectives of this study were to find effectiveness of Doteli language in teaching mathematics at basic level. And to analyze the students view also find parents view of while taught in Doteli language. The main parameter to analyze the effectiveness of Doteli language used as medium is achievement of the students. Pre-test, post-test and non-equivalent were adopted. For this researcher takes two school and one school (Ghante shwar secondary school) is experimental and another one was (Ratna basic school) is control group.

The main tools of data collection were achievement test paper. Pre-test was administered before the experimental started and post-test was administered after experimental. The compare the achievement score of pre-test and post-test of the both group were analyzed by using t-test at 0.05 level of significance. Also find the effectiveness of Doteli language used of medium on mathematics research qualitatively.

This chapter deals with the analysis and interpretation of the data obtained from the field of the study. The collected data were analyzed and interpreted statistically in terms of the following basis

Analysis of Pre-Test Result

The mean, standard deviation, variance and corresponding t-value of the score obtained by experimental and control group students were presented in the table-1, the raw scores of which are Appendix "G"

Table no.2: Pre-test result in Mathematics

Group	No. of St.	Mean	S.D	variance	Mean diff.	t-value	Remarks
Exp. Group	18	10.88	5.22	27.281	0.48	0.273	Null hypothesis Is Accepted
Con. Group	20	10.40	5.60	31.41			

The analysis of the information in Table-2, represents the pre-test result of 18 students in experimental group and 20 students of control group. Pre-test was taken as purpose to find out the level of achievement scores in the mathematics of both groups. The above table shows that experimental group and control group where the mean of experimental group is 10.88 and the mean of control group is 10.40 and standard deviation of experimental group is 5.22 and control group is 5.6 it conclude that both group was near consistency. Thus the mean difference is 0.48 the experimental and control group. It seen that the mean of experimental group is little bit grater than control group but there was average achievement score of the both group. This means that before conducting the treatment to the both groups experimental and control group have the same level of achievement scores in mathematics

Again from the above table it shows that calculate t-values is 0.273 and the tabulate t-value is 1.65 at 0.05 level of significance. The calculate t-value is smaller than the tabulate t-value. Therefore, the null hypothesis was accepted and it was concluded that there is no significance difference in the achievement scores of both group therefore both group have equal mathematics knowledge.

Analysis of Post-Test Results

The mean, standard deviation, variance and corresponding t-value of the scores obtained by experimental and control group students are presented in the table-II, the raw scores of which is given in Appendix "H".

Table no.3: Post-test result in Mathematics

Group	No. of St.		Mean	S.D	Variance	Mean diff.	t-value	Remarks
Experimental Group	18		15.33	4.48	20.11			Null Hypothesis is rejected
Control Group	20		11.80	6.93	48.04	3.53	1.79	

According to the table-II mentioned above represents the post-test result of 18 students in experimental group and 20 students in control group. In order to test hypothesis of the study I established two groups experimental and control group of the students. In the table both the mean score of experimental and control group were different. In other words, the mean score of experimental group were 15.33 and control group were 11.80 generated the standard deviation of experimental group was 4.48 and control group was 6.93 and variance of experimental group is 20.11 and control group was 48.04. After treatment mean score of experimental group is increased by 4.45 but mean score of control group was increased by 1.44.

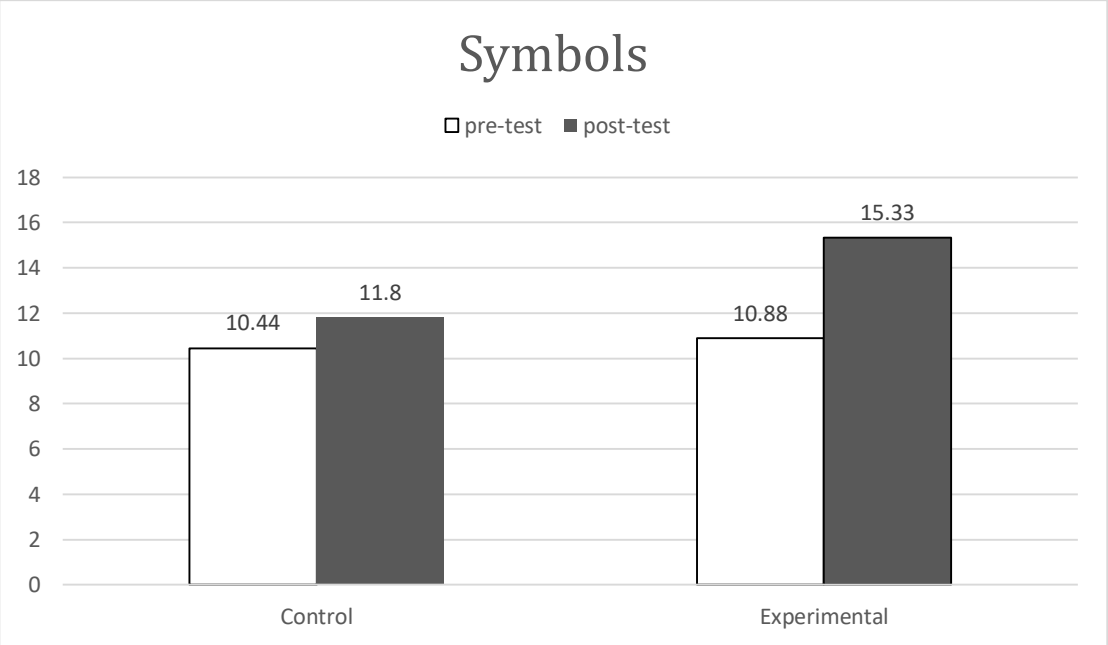
The above table shows that the calculate t-values for independent sample is 1.79 where is the tabulate t-value is 1.65 at 0.025 level of significance. The calculated t-value is grater than the tabulate t-value. Thus the null hypothesis was rejected and

concluded that there is significance difference in the achievement of the both groups. That indicated that the students of experimental group are significantly benefited in achievement of mathematics than the control group.

Comparison of mean score of pre-test and post-test

The analysis has been held to compare the mean score of both control and experimental group in which the score is taken from the raw score of post-test and pre-test.

Multiple bar diagram of comparison of mean of pre-test and post-test



The above diagram represented the comparison of average score of the pre-test and post-test of both control and experimental group. The mean score of the pre-test of control group and experimental group are 10.44 and 10.88 respectively. And the mean score of post-test of control and experimental group are 11.88 and 15.33 respectively. Thus, total average of the pre-test and post-test of control and experimental group is 10.66 and total average 14.95 respectively moreover 4.45 marks increment in mean score of experimental group but 1.44 marks increment in mean score in control group. Hence the mean of the score of the post- test is greater

and thus, the students who have been taught through by use of Doteli language is more effective rather than the teaching mathematics in Nepali language.

Comparison of standard deviation of experimental and control group of pre-test and post-test

The researcher comparison of the standard deviation on the pre-test and post-test of experimental and control group as presented in following table:

Table no.4: Standard deviation

S.N	groups	Standard deviation	
		Pre-test	Post-test
1	Experimental Group	5.22	4.48
2	Control group	5.60	6.93

The above diagram show that the standard deviation on pre-test of experimental and control group were 5.22 and 5.60 respectively, but the standard deviation on post-test of experimental group was 4.48 and control group was 6.93. The standard deviation of experimental group was 0.74 decrement and standard deviation of control group was 1.33 increasing. In this case of less standard deviation, it was found high consistency. So the researcher got low standard deviation in experimental group of post-test and the researcher found high consistency in experimental group than control group.

Then the social constructivism theory said, “The learner learn different types of knowledge with construct, self- exploration and social interaction.” In teaching with Doteli language, teacher is only guideline. Student learn mathematics effectively by exploration and social interaction. According to the Vygotsky theory Zone of Proximal is the difference between what a learner can do without help and what he or

she can do help. In this researcher here is the also different between pre-test and post-post. Different of pre-test and post-test is the effect of the Doteli language.

Student feelings and Parents View about the Doteli Language

The research on the topic "Effectiveness of Doteli language on student achievement in mathematics." Has been done with objectives second and third to analyze the students view towards the filling of using Doteli language also find out the parents view of using Doteli language in grade IV for the qualitative data I take interview two students with experimental group and two parents about using Doteli language in class four.

The interviews in research show a move away seeing participants and data as simply data as somehow external to individuals, and towards regarding knowledge as generated between humans often conversations (Kvale, 1996,p. 11).

An interview can be regarded as change of view between two or more people on a topic, enabling verbal, non-verbal, spoken and heard channels to be used (Cohen et al, 2007). Cannell and khan (1968) have define the interview as a conversation between two people, which being with the interviewer with the purpose of collecting data relevant to their research and focus on content which is determined by the research's goals. However, an interview can note be consider an ordinary conversation since it has a specific purpose, it is based on questions asked by the interview and the response have to be as explicit as possible. `

The used of the interview to analyze the students view and parents view in using Doteli language in class four. The interview has been taken for the students of class four and with their parents. The purpose is to find the effectiveness in teaching mathematics by the use of Doteli language in basic level. Therefore the guideline of interview for the students which are mentioned in Appendix "J" and the interview for the parents is mentioned in Appendix "I"

The research has attempted to calculate the study by describing and analyzing the information acquired in the research process. The collective information were analyzed and described in their perspectives by descriptive ways. Students and parents view with using Doteli language in basis level is describe and analyzed in given below:

The first question asked the students related to feeling of using Doteli language. He answered as follows:

"*We have not ever learnt mathematics using mother tongue. But we feel easy and enjoy to learn mathematics using our language."*

It amide to make the students feel more comfortable and served as a warm-up stage since the learning objectives were already known by the researcher. In the interview I wanted to see the student perspective about the using mother tongue language in mathematics. Hence, it can be concluded from the response of students that they are very much excited to learn mathematics using mother tongue language.

Another student said *"The use of mother tongue while learning mathematics is very interesting and effective rather than learning on Nepali language."*

The view of above two students I concluded that they feel interesting, easy and happy when they learnt in Doteli language. Also improve student achievement when I taught in Doteli language. Students easy to involved or participation in the classroom, homework and classwork also and learning mathematics using mother tongue is obviously interesting and effectives rather than learning mathematics with Nepali language. It has been seen that students are totally benefited if they are learnt with mother tongue.

Again researcher asks the question to the parents in the basis of using Doteli language in teaching mathematics good or bad why?

The parents said that *"It is good, in our society students first learn Doteli language but when children go to school children learn Nepali language so students feel difficult to learn. When we taught in mother tongue language students feel home environment so they learn easy so it good teaching medium in basic level*."

Another parents said that *"language is the one factor of low achievement of Doteli students in learning mathematics because child learn in home at first Doteli language but they want to school they can't understand Nepali language in clearly so students feel difficult to learn mathematics."*

From the view of above two parent language is the most essential affected of the low achievement of Doteli students learning mathematics. When I take the interview of parents, researcher found that there is language misunderstanding between teacher and students. So students feel difficult to learning mathematics in basic level. The above both parents views positive to using Doteli language in basic level. When students learn in Doteli language they clearly understand the language and other concept of mathematics. It is aimed to make comfortable and served as a warm-up stage since they learning objectives were already know by the researcher. The parents and students say that the used in Doteli language in basic level good for us because Students learn easy and effectively.

Again the researcher asked question for the students and parents related to available facility and material in Doteli language teaching at school at school.

They said "*we want to learn in Doteli language but our test book is not in Doteli language and teacher also can't say in Doteli language so it is our problem in learning mathematics. We advise to government available your test book in Doteli language."*

Also both students say that we want to learn mathematics in Doteli language but our teacher can't say in Doteli language so we are confused in learning. They feel

interesting, seasy and happy when they learnt in Doteli language. Also improve their achievement when I taught in Doteli language.

"*Language is the system of communication. Our cultural language is Doteli and child also learn in Doteli language in home but they did not learn Nepali language at home. When they went school they first time learn in Nepali language so they can't understand Nepali language easily so language is the essential factor of low achievement of our children in learning mathematics. So we want to use Doteli language in teaching and also provide the text book in Doteli language*."

The learning environment at home is totally in Doteli language but school in Nepali language so students feel difficult in learning. Both parents say that our child learnt in Doteli language at home when they went to school they start learning in Nepali language at that time they confused in teacher spoken language. Hence it can be concluded from the response of the parents that they are advice the researcher and government provided the Doteli language text book and curriculum in basic level.

Finally, language is the system of communication medium for thought. It is the major component of the teaching and learning. When the researcher taught in class and take a interview it was found that there is a language misunderstanding between teacher and students. Students feel more excited and easy to learn I taught by Doteli language also parents is positive in using Doteli language in basic level. Both students and parents demand is our test book available in Doteli language so they are advice to government and researcher for Doteli language text book and curriculum also.

Chapter V

Summary, Finding, Conclusion, and Recommendation

This chapter includes the summary of finding, conclusion and recommendation for the further study. After analyzing and interpreting the collection data an attempt has been made to summarize and enlist of the finding and some recommendation further study. The first, second, third and last section of this chapter represented respectively summary of research, finding, conclusion and recommendation based on the finding of the study.

Summary of the Study

Mathematics is considered as non- separable part of the human being. Mathematics learning helps students to understanding and interpret the important quantitative aspects of living. Mostly mathematics is taught in all level of school with limited medium of instruction. Medium of instruction plays a vital role to achieve the goals and objectives. Basic level mathematics teaching can be more effectiveness if the medium of instruction is appropriate. Therefore it is necessary to know beforehand which medium of instructional will bring best result in teaching may not be good as effective. Thus considering these things the researcher selected the research topic "Effectiveness of Doteli language on mathematics achievement on grade IV." To know which medium of instructional more effective in basic level mathematics teaching and the objectives was to compare the mathematics achievement of students of grade IV taught by Doteli language and Nepali language.

For field study the researcher selected the two school of Doti district. The selected school were Ghanre shwar secondary school and Ratna basic school. For determine the experimental and control group researcher used coin tossing method. By coin toss GSS is the experimental group and RBS is control group was categorized

in experimental group were 18 students and control group were 20 students. At first pre-test was administrated on both group and calculate the both groups mean, variance and standard deviation. After than in experimental phase I taught experimental group by using Doteli language and control group is taught by Nepali language. I taught 15 same lesson on both group. Finally I take a post test in both group and the score of the students analyzed by using the mean, variance, SD and t-test for independent samples under the Comparison of achievement score of experimental and control groups on pre-test, Comparison of achievement score of experimental and control groups on post-test and Analysis the students and parents view towards Doteli language when using in calls IV.

Finding of the Study

on the basis of analysis and interpretation of the data obtained from the achievement test of experimental group taught in Doteli language and control group is taught by Nepali language, the following finding are obtained.

- There was no significant difference between the average achievement score of experimental and control groups on pre-test. The mean and standard deviation of the experimental and control groups were 10.88 and 5.22, 10.44 and 5.60 respectively and t-test was 0.273.
- There was significant difference between the mean achievement score of experimental and control groups on post-test. The mean and standard deviation of the experimental and control groups were 15.33 and 4.48, 11.80 and 6.93 respectively and t-test was 1.79.
- The mean achievement score of experimental group increased by 4.45 in post-test than pre-test where the mean achievement score of control group increased by 1.40 in post-test than pre-test.

- From the interview of the student researcher found the Doteli language is good medium of teaching mathematics than Nepali language in Doteli students.
- From the interview of the parents, the researcher found that Doteli language is help the Doteli students easy to learning mathematics.

  It is found that students of experimental group are poor in learning mathematics before experimental they were found extremely improved in learning mathematics. In addition the above points while they were taught in their own language they felt pleasure and excited then they were curious and highly interested than the students of control group in learning mathematics activities. During the experimental they did not feel hesitation to explore their felling as well as problems existing since admitted to school but in students of control group such a problem still excited. Therefore students of experimental group were found to more active in interaction in learning mathematics and also activities regarding their attendance. The rate of attendance of students of experimental group was higher than the students of control group.

Conclusion

The research one of the very difficult work. If the design, sample and tools were not selected suitably. Perhaps, the research would be completely failure. The researcher must be selected suitable design, the sample and tools for the study. In this study, sample represented whole students of Doti district in grade IV.

The use of Doteli language as medium of instruction in teaching mathematics helped the students to understand mathematics well and consequently perform better t achievement. Thus the conclusion of the study was that the students taught by Doteli language in mathematics performed better than the students taught by using Nepali language. This research was the explore the felling and change the behavior of the

students and parents view in teaching mathematics with Doteli language in basic level was done qualitatively with the help of interview. They did not get chance to learn mathematics in their own language which they often used in their home. There were so different in language used in school and home where they have grown up with language. Consequently because off the language Doteli students mathematics achievement was so poor but after teaching in Doteli language improve the achievement of students.

Especially mother tongue medium of instruction had crucial role to improve the ability and better understanding to weaker students by providing where students felt free to share their feelings to each other without hesitation.

Recommendation

After conducting any study, the recommendation has to be made of teaching community along with related field can get benefit from the study. On the basis of finding obtained from the analysis of the collected data of this study under taken to explore the effectiveness of Doteli language in teaching basic level mathematics. The following recommendation was made:

- Mother tongue language influence in learning mathematics and teacher should see what difficulties that the learners are facing because of their mother tongue.
- Mathematics teacher should analyze what are the similarities and difference between the Nepali language learner and the mother tongue language if they are going to learn mathematics at basic level.
- The curriculum designer and text writer both should be more conscious while designing the syllabus and writing the text book for the Doteli language.

- The mathematics teacher should use appropriate local teaching material as possible during the classroom teaching.

Suggestions for the Further Study

The conclusion of the study can't generalize to the level of the schooling throughout the country due to the limitation contained in the study so considering the suggestion can made for the study:

- Randomized sample covering the country should be selected in other to obtained much boarder and valid generalization.
- Similar studies be considered in other grade of basic level and sample should be selected different district.
- Beside mathematics, other areas relating to mathematics should be considered in the study.

Finally, I want to say requested to the concerned recommendation into consideration. Furthermore I would like to request the authority to carry out on the various areas of the Doteli language

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Appendix "A"

Pre-Test Paper

बिद्यालयको नाम : श्री घण्टेश्वर मा. बि. कक्षा : ४

बिद्यार्थीको नाम : रोल नं. :

बिषय : मेरो गणित पुर्णाङ्क : ३०

समय : १ घण्टा १५ मिनेट उत्तिर्णाङ्क : १०

समुह 'क' [10×1=10]

सहि उत्तरमा (O) चिह्नले घेरा लगाउनुहोस्

1) यदि p=7 भए 13-p को मान कति हुन्छ ?

a) 10 b) 6 c) 5 d) 8

2) यदि $a=3$ र $b=4$ भए ab को मान कति हुन्छ ?

a) 12 b) 11 c) 13 d) 10

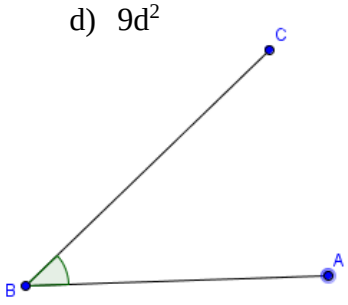
3) $x+2y+3xy$ कति पदिय अभिव्यजक हो ?

a) एक b) दुई c) तिन d) चार

4) $4d+5d$ को योगफल कति हुन्छ ?

a) 9 b) d c) 9d d) $9d^2$

5) तल दिईएको कोणको नाम कुन हो ?



a) ∠ACB b) ∠ABC c) ∠CAB d) ∠BAC

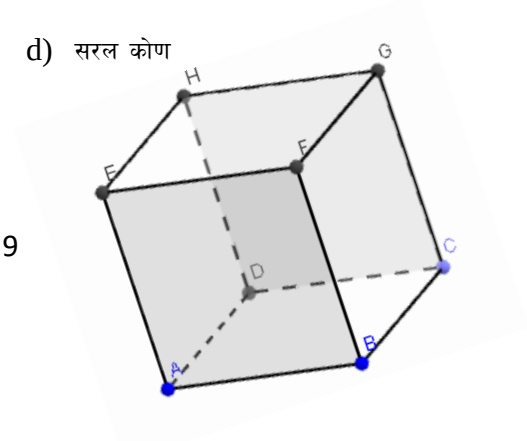
6) ..... कोणलाई समकोण भनिन्छ ।

a) 90^o भन्दा सानो b) 90^o भन्दा ठुलो c) 90^o बराबर d) 180^o बराबर

7) 90^o भन्दा सानो कोणलाई कुन कोण भनिन्छ ?

a) समकोण b) अधिक कोण c) न्युनकोण d) सरल कोण

8) तल दिईएको ठोस वस्तुमा कति ओटा कुनाहरु छन ?



a) 6 b) 7 c) 8 d) 9

9) 692520 मा 6 को स्थान कुन हो ?

a) लाख b) हजार c) दश हजार d) सय

10) 27 र 37 मा कुन रुढ संख्या हो ?

a) 27 b) 27 c) दुबै हुन d) दुबै होईनन्

समूह 'ख' [5×2=10]

11) चल राशी भनेको के हो ?

12) यदि $x=3$ र $y=4$ भए $3x+y$ को मान कति निकाल्नुहोस् ।

13) कोण भनेको के हो ?

14) प्रोट्याक्टर र रुलरको सहायताले 30^o कोणको रचना गर्नुहोस् ।

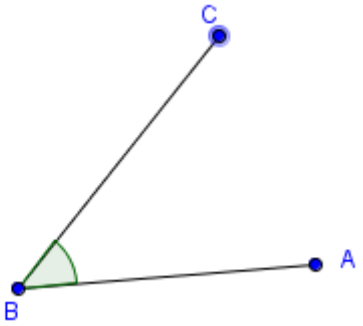
15) गुणन गर

$$\begin{array}{r} 628 \\ \times 23 \\ \hline \end{array}$$

समूह 'ग' [2×3=6]

16) राम संग रु 28,538 थियो । रु. 25,283 पर्ने एउटा टेलिभिजन किनेपछि अब उसंग कति रुपैँया बाँकी रहन्छ होला ?

17) तल दिईएको कोणको नाम र प्रकार लेख्नुहोस् ।



समूह 'घ' [1×4=4]

18) यदि $5x+3=23$ भए $x=?$

Best of Luck!

Appendix "B"

Pre-Test Paper

बिद्यालयको नाम : श्री रत्न आधारभुत बिद्यालय | कक्षा : ४

बिद्यार्थीको नाम : | रोल नं. :

बिषय : मेरो गणित | पुर्णाङ्क : ३०

समय : १ घण्टा १५ मिनेट | उत्तिर्णाङ्क : १०

समुह 'क' [10×1=10]

सहि उत्तरमा (O) चिह्नले घेरा लगाउनुहोस्

19) यदि $a=5$ भए $a=7$ को मान कति हुन्छ ?

e) 9 f) 10 g) 11 h) 12

20) यदि $x=5$ र $y=2$ भए xy को मान कति हुन्छ ?

a) 9 b) 10 c) 11 d) 12

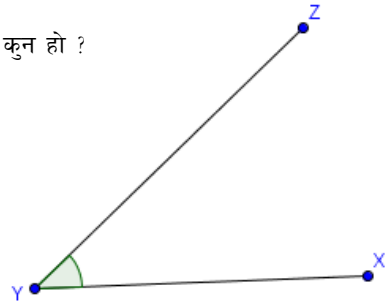
21) $a+2ab+5a^2b^2$ कति पदिय अभिव्यजक हो ?

e) एक f) दुई g) तिन h) चार

22) $x+5x$ को योगफल कति हुन्छ ?

e) 6 f) 6x g) $6x^2$ h) 6xx

23) तल दिईएको कोणको नाम कुन हो ?



e) ∠XZY f) ∠XYZ g) ∠YXZ h) ∠ZXY

24) ..... कोणलाई न्युनकोण भनिन्छ ।

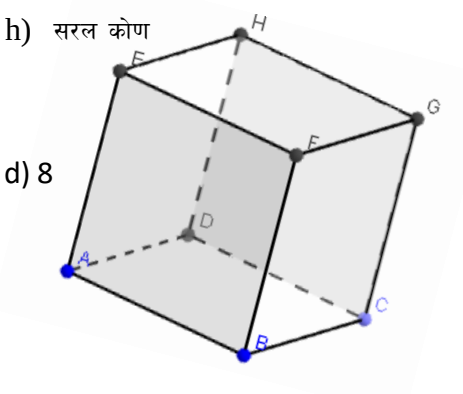
e) 90^o भन्दा सानो f) 90^o भन्दा ठुलो g) 90^o बराबर भएको h) 180^o बराबर भएको

25) 90^o भन्दा ठुलो कोणलाई कुन कोण भनिन्छ ?

e) समकोण f) अधिक कोण g) न्युनकोण h) सरल कोण

26) तल दिईएको ठोस वस्तुमा कति ओटा कुनाहरु छन ?

a) 4 b) 5 c) 6 d) 8



27) दिईएको संख्या 598010 मा 5 को स्थान कुन हो ?

e) लाख f) हजार g) दश हजार h) सय

28) 25 र 5 मा कुन रुढ संख्या हो ?

e) 27 f) 27 g) दुबै हुन h) दुबै होईनन्

समूह 'ख' [5×2=10]

29) 12+x==18 भए x को मान कति हुन्छ ?

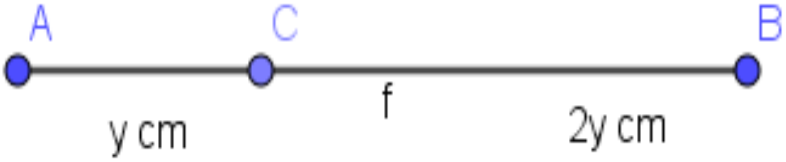
30) न्युनकोण भनेको के हो ?

31) प्रोट्याक्टर र रुलरको सहायताले 30^o कोणको रचना गर्नुहोस् ।

32) गुणन गर

$$\begin{array}{r} 854 \\ \times 32 \\ \hline \end{array}$$

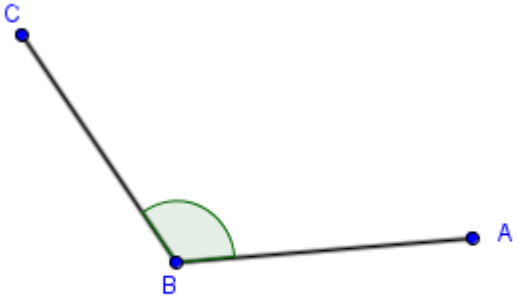
33) दिईएको रेखाखण्डको जम्मा लम्बाई निकाल्नुहोस् ।



समूह 'ग' [2×3=6]

34) सिता संग रु 30,225 थियो । रु. 26,302 पर्ने एउटा टेलिभिजन किनेपछि अब उसंग कति रुपैँया बाँकी रहन्छ होला ?

35) तल दिईएको कोणको नाम र प्रकार लेख्नहोस् ।



समूह 'घ' [1×4=4]

36) यदि $8a+2=26$ भए $a=?$

Best of Luck!

Appendix "C"

Post-Test Paper

बिद्यालयको नाम : : श्री घण्टेश्वर मा. बि. कक्षा : ४

बिद्यार्थीको नाम : रोल नं. :

बिषय : मेरो गणित पुर्णाङ्क : ३०

समय : १ घण्टा १५ मिनेट उत्तिर्णाङ्क : १०

समुह 'क' [10×1=10]

सहि उत्तरमा (O) चिह्नले घेरा लगाउनुहोस्

37) $2x+3y+4z$ कति पदिय अभिव्यजक हो ?

i) एक j) दुई k) तिन l) चार

38) $5x+2x$ को योगफल कति हुन्छ ?

i) 7 j) 7x k) $7x^2$ l) x^2

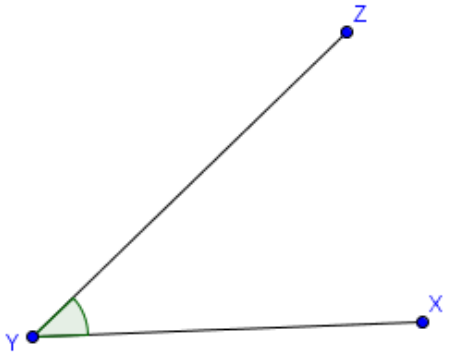
39) यदि $a=5$ र $b=4$ भए ab को मान कति हुन्छ ?

a) 9 b) 1 c) 20 d) 0

40) दिईएको खाली कोठामा तलका मध्ये कुन संख्या राख्नुपर्ला ? **12- □ = 9**

a) 4 b) 3 c) 5 d) 6

41) तल दिईएको कोणको नाम कुन हो ?



i) ∠YXZ j) ∠YZX k) ∠XYZ l) ∠ZXY

42) तल दिईएको अभिव्यञ्जकमा कति ओटा पदहरु छन लोख्नुहोस् ।

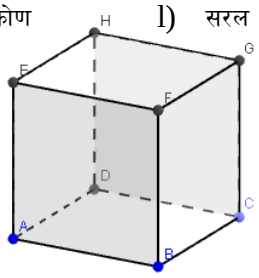
2x+5y+z

i) 3 j) 4 k) 5 l) 5

43) 90^o भन्दा सानो कोणलाई कुन कोण भनिन्छ ?

i) समकोण j) अधिक कोण k) न्युनकोण l) सरल कोण

44) तल दिईएको ठोस वस्तुमा कति ओटा सतहहरु छन ?



a) 5 b) 6 c) 7 d) 8

45) $3x-2x$ को योगफल कति हुन्छ ?

a) x b) 1 c) x^2 d) 2x

46) 90^o बराबर भएको कोणलाई कुन कोण भनिन्छ ?

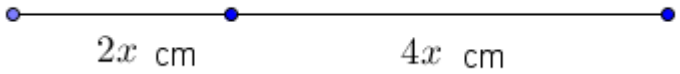
a) समकोण b) अधिक कोण c) न्युनकोण d) सरल कोण

समूह 'ख' [5×2=10]

47) प्रोट्याक्टर र रुलरको सहायताले 30^o कोणको रचना गर्नुहोस् ।

48) 4+x==20 भए x को मान कति हुन्छ ?

49) दिईएको रेखाखण्डको जम्मा लम्बाई निकाल्नुहोस् ।

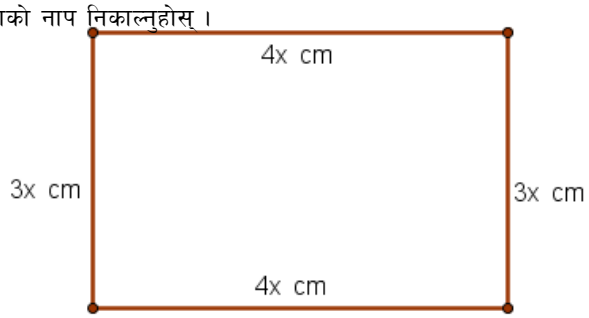


50) यदि $x=3$ र $y=4$ भए $3x+y$ को मान कति निकाल्नुहोस् ।

51) $y-15=3$ भए y को मान कति निकाल ।

समूह 'ग' [2×3=6]

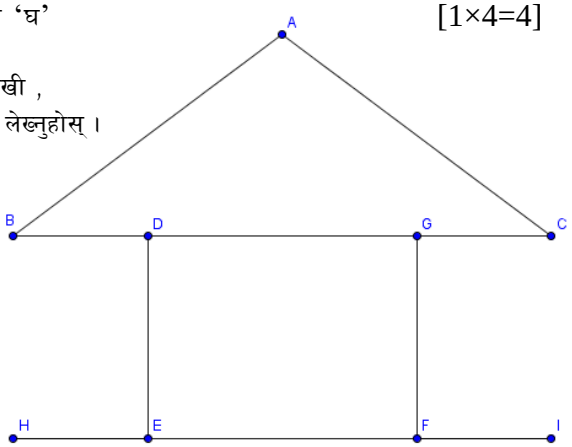
52) दिईएको ज्यामितिय आकारको वरपरको घेराको नाप निकाल्नुहोस् ।



53) यदि $5x-5=25$ भए $x=?$

समूह 'घ' [1×4=4]

54) तल दिईएको चित्रमा भएका कोणहरुको नाम लेखी , समकोण, अधिककोण , वा न्युनकोण के-के हुन् लेख्नुहोस् ।



Best of Luck!

Appendix "D"

Post-Test Paper

बिद्यालयको नाम : श्री रत्न आधारभुत बिद्यालय | कक्षा : ४

बिद्यार्थीको नाम : | रोल नं. :

बिषय : मेरो गणित | पुर्णाङ्क : ३०

समय : १ घण्टा १५ मिनेट | उत्तिर्णाङ्क : १०

समुह 'क' [10×1=10]

सहि उत्तरमा (O) चिह्नले घेरा लगाउनुहोस्

55) $x+y+z$ कति पदिय अभिव्यजक हो ?

m) एक n) दुई o) तिन p) चार

56) $5a+3a$ को योगफल कति हुन्छ ?

m) 8 *n) 8a* *o) $8a^2$* *p) a*

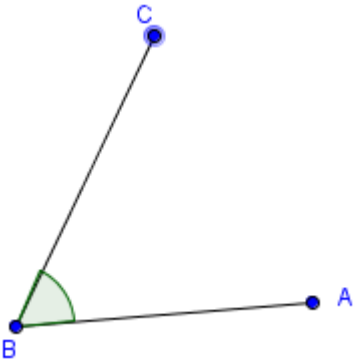
57) यदि $x=4$ र $y=3$ भए xy को मान कति हुन्छ ?

a) 12 b) 11 c) 10 d) 7

58) दिईएको खाली कोठामा तलका मध्ये कुन संख्या राख्नुपर्ला ? **15+ ☐ = 19**

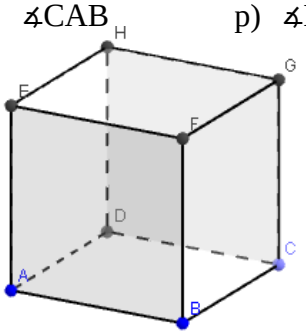
e) 3 f) 4 g) 5 h) 6

59) तल दिईएको कोणको नाम कुन हो ?



m) ∡BAC n) ∡ABC o) ∡CAB p) ∡BCA

60) तल दिईएको ठोस वस्तुमा कति ओटा कुनाहरु छन ?



a) 6 b) 7 c) 8 d) 9

61) 90^o बराबर भएको कोणलाई कुन कोण भनिन्छ ?

m) समकोण n) अधिक कोण o) न्युनकोण p) सरल कोण

62) तल दिईएको ठोस वस्तुमा कति ओटा सतहहरु छन ?

a) 5 b) 6 c) 7 d) 8

63) $3a-2a$ को योगफल कति हुन्छ ?

e) a f) 2a g) a^2 h) 1

64) दिईएको अभिव्यञ्जकमा कति ओटा पदहरु छन लेख्नुहोस् । ***a-b-c-d+e***

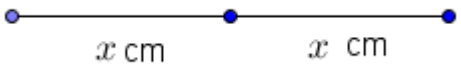
e) 3 f) 4 g) 5 h) 6

समूह 'ख' [5×2=10]

65) प्रोट्याक्टर र रुलरको सहायताले 60^o कोणको रचना गर्नुहोस् ।

66) 10+y==15 भए y को मान कति हुन्छ ?

67) दिईएको रेखाखण्डको जम्मा लम्बाई निकाल्नुहोस् ।

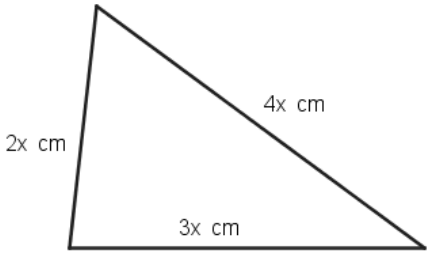


68) यदि $a=5$ र $b=3$ भए $3a+b$ को मान कति निकाल्नुहोस् ।

69) $x-20=5$ भए x को मान कति निकाल ।

समूह 'ग' [2×3=6]

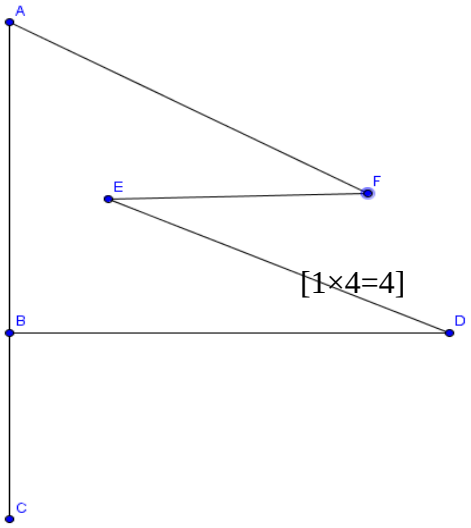
70) दिईएको ज्यामितिय आकारको वरपरको घेराको नाप निकाल्नुहोस् ।



71) यदि $4x+4=20$ भए $x=?$

समूह 'घ' [1×4=4]

72) तल दिईएको चित्रमा भएका कोणहरुको नाम लेखी समकोण, अधिककोण , वा न्युनकोण के-के हुन् लेख्नुहोस् ।



Best of Luck!

Appendix "E"

Item analysis of the Test

Item No.	Upper 27% students with Correct response						Lower 27% students with Correct response						c					
	1	2	3	4	5	Total	1	2	3	4	5	Total						
1	1	0	1	1	1	4	1	0	1	0	0	2	6	4	2	0.60	0.44	
2	1	1	1	1	1	5	0	0	0	0	0	0	5	5	0	0.50	1	
3	0	1	1	0	1	3	0	0	1	1	0	2	5	3	2	0.50	0.20	
4	1	1	1	1	0	4	1	1	0	0	0	2	6	4	2	0.60	0.80	
5	0	1	0	1	0	2	0	0	0	1	1	2	4	2	2	0.40	0.00	c
6	1	1	1	1	1	5	0	0	1	0	0	1	6	5	1	060	080	
7	1	1	1	1	0	4	0	0	1	0	0	1	5	4	1	0.50	0.60	
8	1	1	1	1	0	4	0	0	0	1	1	2	6	4	2	0.60	0.80	
9	1	0	1	1	1	4	0	0	0	0	0	0	4	4	0	0.40	0.80	
10	1	1	1	1	1	5	0	1	0	0	0	1	6	5	1	0.60	0.80	
11	1	0	0	0	0	1	1	0	0	0	0	1	2	1	1	0.20	0.00	c
12	0	1	0	1	1	3	0	0	0	1	1	2	5	3	2	0.50	0.20	
13	1	1	0	1	1	4	0	1	1	1	0	3	7	4	3	0.70	0.20	
14	1	1	1	0	1	4	1	0	0	0	1	2	6	4	2	0.60	0.4	
15	0	1	1	1	1	4	1	1	1	1	1	5	9	4	5	0.90	-0.20	c
16	1	1	1	1	1	5	0	1	0	0	0	1	6	5	1	0.70	0.80	
17	1	1	1	0	1	4	0	0	0	1	0	1	5	4	1	0.50	0.60	
18	1	1	1	1	1	5	0	1	1	1	0	3	8	5	3	0.80	0.40	

Appendix "F"

Pre-test score of Experimental and control group of 30 full marks

(Arrange in descending order)

S.N	Experimental Group		Control Group	
	Scores	frequency	scores	frequency
1	20	1	22	1
2	17	2	18	1
3	15	3	16	3
4	12	2	15	2
5	10	2	11	2
6	8	2	10	2
7	7	1	8	3
8	6	1	5	2
9	4	2	4	2
10	2	1	3	2
	Total students	18	Total students	20
	Mean	10.88	mean	10.44
	SD	5.22	SD	5.60
	variance	27.281	variance	31.41

Appendix "G"

Post-test score of Experimental and control group of 30 full marks

(Arrange in descending order)

S.N	Experimental Group		Control Group	
	Scores	frequency	scores	Frequency
1	25	1	26	1
2	22	1	23	1
3	20	2	22	2
4	18	1	16	1
5	17	1	14	3
6	16	2	11	1
7	15	3	10	2
8	13	1	9	1
9	12	3	8	1
10	10	2	7	2
11	8	1	6	2
			5	1
			4	1
	Total students	18	Total students	19
	mean	15.33	mean	11.80
	SD	4.48	SD	6.93
	variance	20.11	variance	48.04

Appendix "H"

Reliability of the achievement test

S.N	Score on Odd items (X)	Score on Even items (Y)	X^2	Y^2	XY
1	17	21	289	441	257
2	17	21	289	441	357
3	22	14	484	196	308
4	22	20	484	400	440
5	15	19	225	361	285
6	24	19	576	361	456
7	17	24	289	576	408
8	6	14	36	196	84
9	14	1	196	1	14
10	4	10	16	100	40
11	10	4	100	16	40
12	6	4	36	16	24
13	3	4	9	16	12
14	10	10	100	100	100
Total	$\sum X$=187	$\sum Y$=185	$\sum X^2$=3120	$\sum Y^2$=3221	$\sum XY$=2925

Where X= number of correct response for odd question

Y= number of correct response for even question

Now Karl Pearson's coefficient of correlation

$$(r_{xy}) = \frac{N\sum XY - \sum X \sum Y}{\sqrt{\{N\sum X^2 - (\sum X)^2\}N\sum Y^2 - (\sum Y)^2}} = 0.85$$

Reliability coefficient (r) = $\frac{2r_{xy}}{1+r_{xy}}$ =0.92

Appendix "I"

Interview Guidelines (for parents)

Name: Date:

Address: Occupation:

Religion: Family size:

Sex: Qualification:

Cast: Age:

The interview with the parents had been taken on basis of following main topics:

- View towards mother tongue language in teaching
- Effect of School and home environment in learning
- Effect about the improvement of their children achievement in mathematics when I taught in Doteli language.
- Available facility at school about Doteli language teaching.

Appendix "J"

Interview Guidelines (for students)

Name: Date:

Address: Class:

Religion: Age:

Sex: school name:

The interview with the parents had been taken on basis of following main topics:

- Difficult in learning mathematics when I taught in Doteli language.
- View towards in mother tongue language.
- View about their culture and language.
- Available facility at school about Doteli language teaching.

Appendix- K

Some statistical formula used for data analysis

- Mean ($\bar{X}$) = $\sum \frac{fd}{N}$

- Variance (S^2) = $\frac{fd^2}{N} - \left(\sum \frac{fd}{N}\right)^2$

- Standard deviation (S) = $\sqrt{\frac{fd^2}{N} - \left(\sum \frac{fd}{N}\right)^2}$

- Pearson's coefficient of correlation $(r_{xy}) = \frac{N \sum XY - \sum X \sum Y}{\sqrt{\{N \sum X^2 - (\sum X)^2\} N \sum Y^2 - (\sum Y)^2}}$

- t-test determine significance difference between two mean

$$t = \frac{\overline{X}_1 - \overline{X}_2}{\sqrt{\frac{S_1^2}{N_1} + \frac{S_2^2}{N_2}}}$$

- Spearman Brown Split-half Reliability coefficient (r) = $\frac{2r_{xy}}{1+r_{xy}}$

Teaching Episode- 1 (For Control Group)

Unit: geometry **Class: 4**

Topic: measurement of Angles **Time: 40 min**

Specific objectives:

- To measure the angle 0^0- 180^0

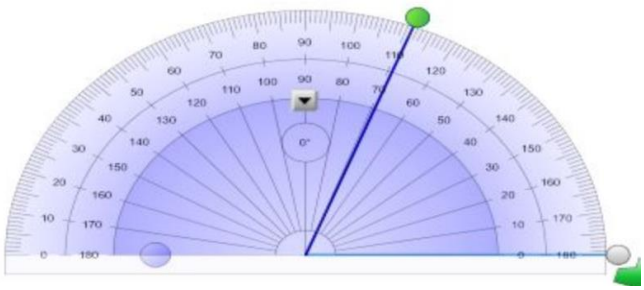
Materials: protractor, wooden materials.

Activities:

- First teacher discuss about previous class.
- Teacher ask some question;

- In which instrument measure the angle?
- How to measure the angle?

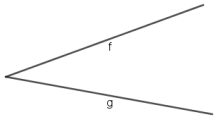
- Teacher will show different parts of protractor like as midpoint, baseline
- Teacher will say about the measuring process with example. E.g.

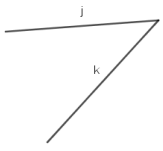


- Teacher will provided the different angle and ask to students to measure the angles correctly and write the degree of each angles.

Evaluation:

1. Measure the following angles and write their degree.





Teaching Episode- 2 (For Control Group)

Unit: geometry **Class: 4**

Topic: measurement of Angles **Time: 40 min**

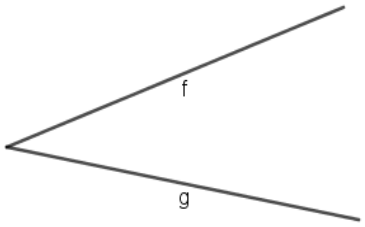
Specific objectives:

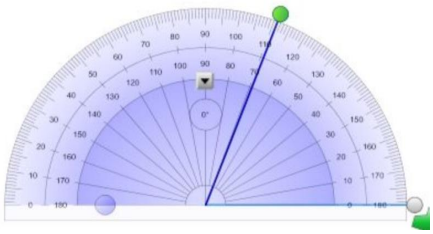
2. To construction the angle 0^0- 180^0

Materials: sticks, pencil, protractor and rulur.

Activities:

3. First teacher discuss about measuring process of angle.
4. Teacher will ask to the students, how we construct the angle? Can we construct angle of 30^0 and 60^0?
5. Teacher will say, we can construct different angle through the protractor.
6. After that teacher will describe about construct process through pencil by using protractor as like as;





7. Teacher will provided the different degree of angle (e.g. 10^0, 20^0, 40^0, 60^0, 90^0) and ask to students to make the angle on your copy

Evaluation: draw the following angle on your copy by the help of protractor.

40^0, 60^0, 90^0, 150^0

Appendix : L

Teaching episode: 1(for experimental group)

पाठ: ज्यामिति

कक्षा : ४

शिर्षक : कोणको नाप

समय: ४० मि.

विशिष्ट उद्देश्य: 0-180° सम्मको कोण नाप्न

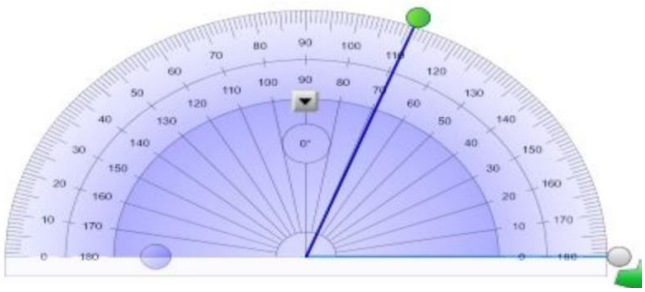
शिक्षण सामग्री: पेन्सिल, प्रोटेक्टर, रुलर

शिक्षण क्रियाकलपा

- सबै है पल्ला बेली पणाया पाठको बारेमी कुरणी कानि अद्दै
- तै पछा केहि प्रश्नहरु सोध्या जसै:

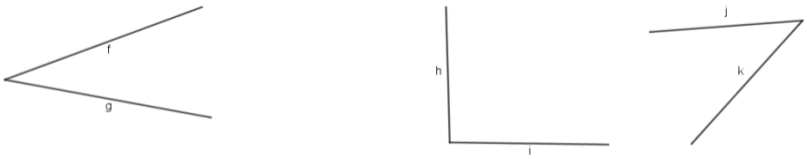
  कोण कसेरी नाप्दै

  कोण क्याले नाप्दै
- तैपछा प्रोटेक्टर देखाइबर तेइका सबै भाग विचको विन्दु, आधारको लाइन आदी पछणाउने
- तैपछा एक कोण देखाइबर प्रोटेक्टरले नापि वर देखाउन्या



- तै पछा किताबमा भएका न्यारन्यारै कोण विद्यार्थिलाई समुहमा बाडीवर नाप्द लगाइ डिग्री पनि लेख्छ लाउन्या

मूल्याङ्कन: तालिमण दिएका कोण नापी वर लिनको डिग्री लै लेख:



Teaching episode : 2 (for experimental group)

पाठः ज्यामिति

कक्षा : ४

शिर्षक : कोणहरुको नाप

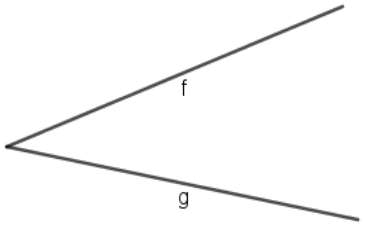
समयः ४० मि.

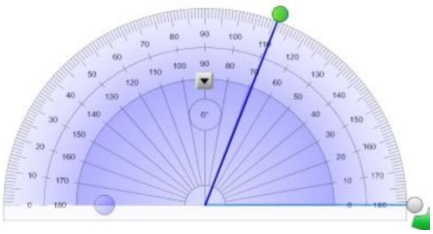
विशिष्ट उद्देश्यः 0-180° सम्मको कोण रचना गर्न

शिक्षण सामग्रीः पेन्सिल, प्रोटेक्टर, रुलर

शिक्षण क्रियाकलाप

- सबै है पल्ला बेली पणाया पाठलाई सम्झाउने
- तै पछा कसेरी कोण खिच सजिलो भणी वर प्रश्न सोध्या
- तै पछा प्रोटेक्टर स्केल साहयताले एक कोण खिचि बर देखाउन्या जसैः





- तै पछा न्यार न्याराइ कोण 20°, 40°, 60°, 90° :विद्यार्थीलाई समुहमा बडिवर खिच लाउन्या र नैजाणा ठाउमै सहयोग अद्या
- मूल्याङ्कनः तलिमणा दिएका कोण कापिमा बनाउना धै

  45°, 35° र 70°