Factors Affecting the Student Success: A Survey Study

A

Thesis

By

Rewat Bastola

In the Partial Fulfilment of the Requirement for the

Degree of Master of Education

Submitted

To

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LETTER OF CERTIFICATE

This is to certify that Mr. **Rewat Bastola** a student of academic year 2070 campus Roll Number **372,** Thesis Number **1571** Exam Roll Number **280508 (2073)** and TU registration number **9-2-29-932-2008** has completed this thesis for the period prescribed by the rules and regulations of Tribhuvan University, Nepal. This thesis entitled '**Factors Affecting the Student Success: A Survey Study**' 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.

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Prof. Dr. Bed Raj Acharya

Date:- 10 March 2021 (Head)

22 March 2021

LETTER OF APPROVAL

This thesis entitled "**Factors Affecting the Student Success: A Survey Study**'" submitted by **Mr. Rewat Bastola** in partial fulfillment of the requirements for the Master's Degree in Education has been approved.

Viva Voce Committee	**Signature**
Prof. Dr. Bed Raj Acharya (Chairman)	……..
Assoc. Prof. Laxmi Narayan Yadav (External)	……
Mr. Krishna Prasad Adhikari) (Member)	…….

Date: 22 March 2021

RECOMMENDATION FOR ACCEPTANCE

This is to certify that Mr. Rewat Bastola has completed his M. Ed. thesis ent

"**Factors Affecting the Student Success: A Survey Study**'" 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.

…….

(Mr. Krishna Prasad Adhikari)

Supervisor

Date: ……..

Declaration

This dissertation contains no material which has been accepted for the award of other 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.

……

Rewat Bastola

Date: ……

Defence Date:

Dedication

To my respected parents:

Gaurinath Bastola and Mayadevi Bastola

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Abstract

The primary purpose of the study was to examine the factors affecting students' success in mathematics. The researcher used a descriptive survey was implemented in order to collect data from the sampled group to complete the study. Eighty students from two schools participated and completed the questionnaire. The researchers analysed the questionnaire data using mean and frequency by performing SPSS 16.0 setting 0.05 level of significance, whereas, the interview data were managed and analyzed using computer program NVivo 12 plus. The findings of the study explored that work load and motivation were highly correlated. Furthermore, teaching methods and home background were not correlated. In addition to this the researcher found that motivation and prior knowledge in mathematics had highly influenced on students' final grade. Moreover, peer interaction had valuable proportion of contribution to the final achievement of students in mathematics. However, some certain aspects and components of adopted model need to be upgraded in terms of the context of educational setting. Thus, it is important to take into account students success in mathematics in order to implement different model based learning for mathematics teaching and learning and to have comprehensible understanding of the factors that benefit and hinder the academic progress of an individual's education.

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Chapter I

Introduction

Background of the Study

Despite the continued efforts of improving student performance in mathematics, there is larger gap between high achievers and low achievers. There are lots of things, both intrinsic and extrinsic that can affect students grades, ability to learn, and ultimately students success in high school. This disparity in the achievement in private or institutional and public schools has been a source of social inequity in mathematics education. There is also a difference in the achievement of Dalit students compared to students from other communities in Nepal creating another gap in the achievement in mathematics (MOE 2015).

The NASA report also suggests that there is a wide gap in the students' achievement between rural and urban schools in Nepal and this gap is about 24% in the grade 8 (MOE 2015). The same report indicates that many students (about 37%) were never assigned any homework by their mathematics teachers and their achievement was found to be lower than other students who were assigned homework. The overall performance of students in mathematics in Nepal has been found to be right-skewed (right-tailed) indicating that many students had a lower grade than the median grade. At the same time, the performance or achievement of students has been found to be influenced by parents' education in a positive way (MOE 2015). The achievement gap in all areas of education in general and mathematics education has been a fundamental issue in Nepalese education despite many efforts by the government and non-government organizations.

In a report, UNESCO states:

> Male-female gender gap though decreasing is still noticeable and prevails across almost all castes and ethnic groups, rural and urban areas, eco-zones, development regions, and income groups. Huge gaps exist in educational access in terms of gender, social groups, location, disabilities, and level of income. The quality of education and students' learning achievements at all levels of education (from kindergarten to higher education) remain one of the foremost challenges of the education sector in Nepal (UNESCO 2015, p. 6).

There is a range of factors such as social and personal factors that affects learning outcomes in Nepal. These factors may also student's preference for learning in mathematics learning. Furthermore, Panthi and Belbase (2015) considered the structure of the mathematics course influences learning contexts and learning process, and hence affects student achievement.

The National Curriculum Framework for School Education in Nepal 2007 states that "economic, social, cultural and the political situation of the country are the major hindrances in maintaining the expected educational standard" (CDC 2007, p. 28).The pedagogical choice of teachers to engage students in higher-order thinking, reasoning, and problem-solving has a direct influence on their performance. Many students in Nepali schools can solve basic mathematics problems, but they are not competent in critical thinking, reasoning, and problem-solving, especially working on "the open-ended questions of higher cognitive level" (MOE 2015, p. viii). The National Framework for School Education in Nepal 2007 outlines some key issues in school education in Nepal including "lacking tri-polar (teachers, students, and guardians) interaction in teaching" (CDC, 2007, p. 21).

Thus, this study has intended to identify the factors affecting student success in mathematics learning and to identify how these factors affect student achievement in mathematics. Various report of the Ministry of Education, Nepal shows that there are a lot of challenges such as political, social and other factors that hinged on the learning process and hence in mathematics learning. Thus, it wasnecessary to conduct a study.Hence, this study was intended to identify the factors affecting student success in mathematics learning and to identify how these factors affect student achievement in mathematics.

Statement of the Problem

There are different factors such as personal, social and institutional that affect the student success in mathematics. However, there are many intellectual debates and discussions around which of these factors has the strongest relation to learning achievement. These factors make hindrance to achieve the goal of mathematics curriculum in school level in the context of Nepal, however, teachers of mathematics are encouraged to make meaningful learning for mathematics through in-service training and short term seminars and conferences.

The continued efforts on education have not been successful due to the lower level performance of students in mathematics because there is a range of factors affecting student success in mathematics. Thus, it has become a challenge that what factors to exactly influence the students' performance in mathematics. Furthermore, some factors are related to each other.Factors related to student achievement can be practically limitless (UNESCO, 2018). However, (Meyer, 2011) stated that student characteristics, institutional characteristics and intuitional characteristics influence student success in educational programs. More importantly, Meyer (2011) did not focus on mathematics learning process.

Kizito, Munyakazi and Basuayi (2015) stated that students' performance in mathematics can be improved by incorporating different methods of teaching. However, they did not statewhich methods are best for improving students' performance in mathematics. Thus, the primary concern of this study was be to examine the following statements:

- What are affecting factors of student success in mathematics?
- How did these factors affect student success in mathematics?

Objectives of the study

The objective of the study refers to a specific result that the researcher aims to achieve within a stipulated time frame using available resources. The objectives are more specific and measurable than goals. Moreover, the objectives of the study are basic tools that underlie all planning and provide guidelines for all activities of the research. The main objective of this study was:

- To examine the factors affecting students' success in mathematics.

Justification of the Study

The significance of the study refers to the rationale of the study. The study of this type would be useful to reconsider the effects that affect student success in mathematics. This study will be useful to the teachers of mathematics, policymakers, new researchers, schools and mathematics education society. Thus, this study might be useful to the following personnel:

Teachers. This study may be useful the teachers of mathematics to reconstruct the teaching plan considering the affecting factors that influence student success in mathematics.

Policymakers. The result of this result may be useful to the policymakers to get information about how different academic and non-academic factors affect student success in mathematics.

Schools. This study might be useful to the school to encourage mathematics teachers to use modified teaching styles by facilitating teaching aids and managing interactive learning climate.

Researchers. This study may be useful to new researchers in mathematics education and pedagogy. This research would recommend some hidden aspects of the issues that have not been researched yet. In sum, this research will be useful to each person who is related to mathematics education or rather interested in mathematics Education.

Delimitation of the Study

Delimitations of the study refer to the boundaries that are set by the researcher to control the range of the study. It means that delimitations aim to narrow the research within a specific boundary. This research was completed within the following periphery:

- This is survey design in which the researcher surveyed questionnaire among 30 students of grade 10.
- This study was completed in Roshi Rural Municipality (Kavrepalchok District) of Nepal.
- The researcher used questionnaire, semi-structured interview and students' achievement of the previous grade as the data collection instrument.
- The analysis of the questionnaire data wasquantitative and interview data was added to the questionnaire data to enrich the data.

Operational Definitions of Key Terms

Student Success. Student success refers to the higher achievement (40% - 60%) of students in mathematics.

Factors. Factors refer to the assessment index of the students' success.

Presage. Presage refers to all the factors that are existing prior to learning. It includes student's home background, prior learning experience, the teaching method used in the classroom, assessment process.

Process. Process refers to the learning process which influenced by presage. Because the learning preference of students in mathematics learning influenced by different presage factors. Students perception towards teaching styles and teacher's assistance to student partially belongs to the process because students may need teachers to help in the learning process.

Product. Product refers to the final achievement of students in mathematics examination.

Chapter II

Review of Related Literature

Literature review is the summary of a journal article related to the topic which is going to be studied (Creswell, 2014). It helps the researcher to identify the gap between the existing body of knowledge and adds the significance of the study. This chapter presents a review of related literature. More specifically, this chapter includes Empirical Review and Theoretical and Conceptual framework of the study.

Empirical Review

Kizito, Munyakazi and Basuayi (2015) conducted a study entitled on "Factors affecting student success in a first-year mathematics course: A South African experience" to try and improve student academic performance, the number of students succeeding in first-year mathematics courses remains disturbingly low. They used an exploratory descriptive design using a questionnaire among 86 students. The reliability of the questionnaire was 0.916 based on Cronbach's Alpha model. Findings of this study show that students' perceptions of their workload emerged as the factor having the greatest impact on student's performance, followed by the matriculation examination score. Moreover, the study succinctly underscores that developing appropriate teaching methods can improve teaching and contribute to student success in a first-year mathematics course in a South African context.

Farooq, M. S., Chaudhary, A.H, Shafiq, M. and Berhanu, G. (2011) conducted a study entitled'Factors Affecting Students' Quality Of Academic Performance: A Case Of Secondary School Level' to examine different factors influencing the academic performance of secondary school students in a metropolitan city of Pakistan. The respondents for this study were 10th grade students (300 male &

300 female). The researachers used a survey by using a questionnaire for information gathering about different factors relating to academic performance of students. The academic performance was gauged by the result of their 9th grade annual examination. Standard t-test and ANOVA were applied to investigate the effect of different factors on students' achievement. The results of the study revealed that socio-economic status (SES) and parents' education have a significant effect on students' overall academic achievement as well as achievement in the subjects of Mathematics and English. The high and average socio-economic level affects the performance more than the lower level. In this study it was underscored that parents' education means more than their occupation in relation to their children's academic performance at school. furthermore, the researchers found that girls perform better than the male students.

Within the South African context, Tewari (2014) has recently completed a study in which he demonstrates that the mathematics score of the South African school leaving certificate is a good predictor of first-year university success. However, in general, universities still do not have a clear indication of how or whether reforms at the school level have improved proficiency in mathematics at the university level. Venezia and Jaeger (2013) contend that an evaluation of a synthesis of reform efforts has not been vigorous enough. These authors report that not enough research has been conducted to establish if efforts designed to improve university readiness standards do make a real difference to the percentage of students succeeding at the university level.

Khurshid, F. (2014) conducted a study entitled on " Factors Affecting Higher Education Students' Success" to investigate factors those are facilitating success among higher education students. It was quantitative in nature, in which scientific

methodology was used to measure the research objectives. Students' success scale was developed in this study through a standardized procedure which was based on 56 items and five subscales, named as, Students' Personal Characteristics , Factors related with Institutional Support, Factors related with Family Support, Students' Awareness and Access to Resource. Developed scale was administered on a stratified random sample of 100 Master level students (50 male and 50 female) studying at Quaid-i- Azam university, National University of Modern Language and International Islamic University. With the help of a statistical package of social sciences collected data was analyzed with statistical procedure i.e., SD, correlation and analysis of variance. Results revealed that in the acquisition of students' success their personal characteristics, factors related with institutional support, family support, their awareness and access to learning resource are playing a very important role. Male university students are showing more strong academic related characteristics as compared to female university students. Those students whose fathers are teaching professionals are exhibiting higher scores on students' success questionnaire and those whose fathers are business men scored lower. Higher education management and teachers can play a significant role in the determination of students' success if they devise management practices in collaboration with the factors that are promoting success among learners and by providing conducive learning environment with maximum learning resources.

Hart (2013) conducted a study on effects of socio-economic status on student's achievement and concluded that learners who belong to lower socio-economic background perform often lower than the students belonging to higher socio-economic background, as they are unable to utilize all the facilities having by the learners of higher socio-economic background. He further stated that learners

from low socio-economic background have to face more challenging situations like lack of resources, part time job responsibilities, and in result high level of tension that can result in negative effects on their academic motivation. Hart also commented that families with low socio-economic status cannot provide their children with extra educational material, facilities and part time that affect their child's performance negatively.

Meyer (2011) conducted a study entitled on "Factors affecting student Success in Postsecondary Academic Correctional Education Programs" to identify the factors associated with student success in undergraduate education outside of prison setting. The Hierarchical linear model was used in order to complete this study. The results identify characteristics of students, instructional programs and institutions that influence student outcomes and factors that moderate these relationships.

Krashen (2005) concluded that students whose parents are educated score higher on standardized tests than those whose parents were not educated. Educated parents can better communicate with their children regarding the school work, activities and the information being taught at school. They can better assist their children in their work and participate at school. It is also observed that the economically disadvantaged parents are less able to afford the cost of education of their children at higher levels and consequently they do not work at their fullest potential (Rouse & Barrow, 2006).

Yayan and Berberoğlu (2004) investigated a linear structural model to explain the relationships among a set of latent variables, constituted through the use of principal component analysis and confirmatory factor analysis. It is analyzed to explore factors that were influential in explaining students' achievement in mathematics by TIMSS 98/99 data. The results of the study indicated that three

factors, students' affective measures, home-family background characteristics and what teachers do in the classroom are the most important variables to explain achievement in mathematics. According to them, what might be required from educational policymakers in Turkey is to consider these three factors together to enhance the quality of educational practices.

Moreover, Papanastasiou and Koutselini (2003) presented the Cyprus, results and proposed a model of the home environment and school climate on the social participation of ninth-graders based on the IEA 1999 CIVIC education study data. The objective was to design a model, using two exogenous constructs-the home environment and school climate, and four endogenous constructs-political interest of the student, political environment of the student, democratic values and social participation of the student in social actions. The study demonstrated that political interest and school climate influence political interest and political environment and these endogenous factors influence the democratic values of the students.

Shonk and Cicchetti (2001) suggested that the behavior and treatment of family towards children affects their academic performance. If, due to any reason children are not handled with care or are not supported positively by their family it causes the slowing down of the performance of student in his educational field. Hossler, Schmit and Vesper (1999) stated that parent's level of education and support provided to the student is also an important factor in increasing the achievement of students at Post secondary level. Along with the family, peer group involvement can also play a vital role in enhancing the academic achievement of the students. Many psychologists have suggested the use of peer support for enhancing student understanding and also supporting the teacher in using his teaching strategies.

A research conducted by Hossler and Schmit and Vesper (1999) that student's selection process for institution is effected by many factors including student ability, sibling'seducational status and level. Along with the selection of college the students are also inspired by their elder siblings.

Reynolds, A. J. (1998) conducted a research on factors that can enhance learners achievement in education institutions, as a result five factors were explored those are affecting the learners' performance such as, teaching of basic skills to the learners, positive expectations from every student, formative assessment activities, safe institutional environment and dynamic institutional leadership. At education level teachers are expected to exercise professionalism in their practices as they can bring change in learners' behaviour through model, moreover they can use different strategies to motivate learners towards attainment of successfulness in life.

From this literature review, it is clear only a few studies focused on identifying different factors such as academic and nonacademic affecting student success in mathematics. However, few examined that students' perceptions influence the preference of students learning. There is a range of factors that affect on the quality of performance of students (Waters & Marzano, 2006). A series of variables are to be considered when to identify the affecting factors towards quality of academic success. Identifying the most contributing variables in quality of academic performance is a very complex and challenging job. The students in public schools belong to a variety of backgrounds depending upon their demography. Thus, in this study, the researcher identifies the factors affecting student success in mathematics in the context of Nepal and then measures how these factors influence students success in mathematics.

Theoretical and Conceptual Framework

The theoretical framework for this study will be J. B. Biggs's (1999) theory of student learning approaches, known as Bigg's 3P Model, in which the learning process is conceptualized as a system resulting from the effects of 'three sets of interacting variables: student characteristics and the learning environment (presage factors), students approach of learning (process) and the learning outcomes (product).

Presage factors refer to students' characteristics such as prior knowledge and experience in mathematics contents, ability to do mathematics-related problems. It also refers to learning contexts such as teaching methods or teaching styles, the workload to the students, course structure and assessment procedure.

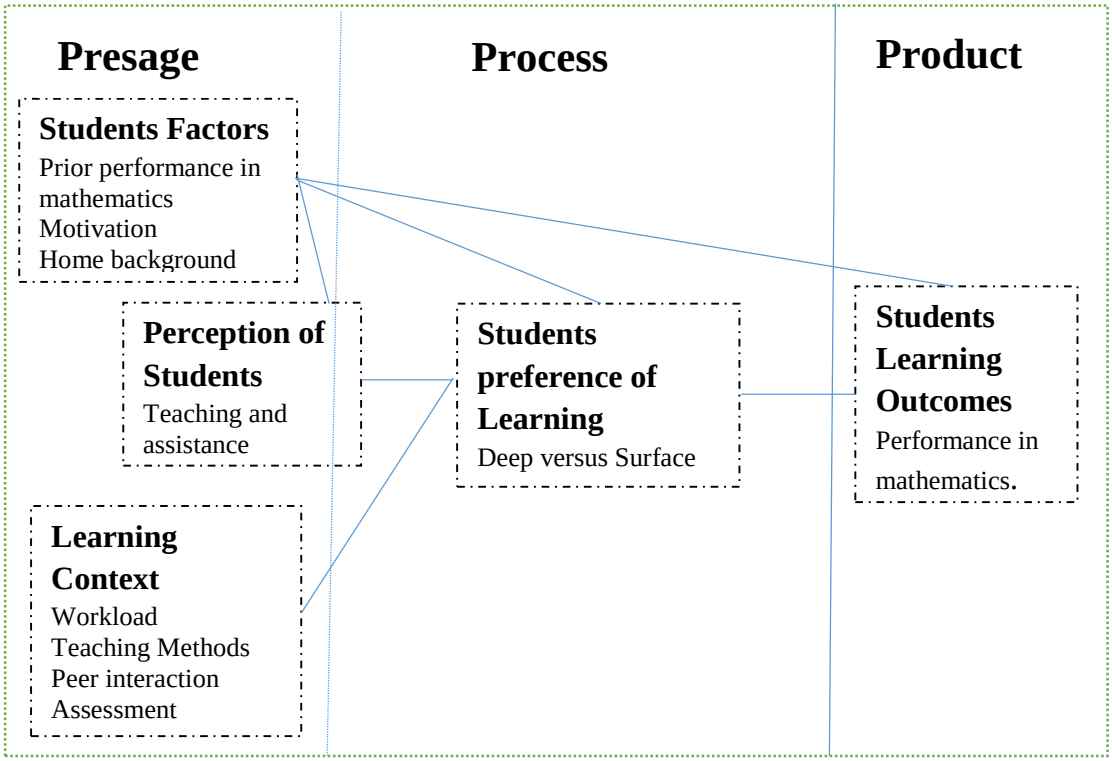
Process factors include the preference of students learning either surface or deep approach. The learning approach is the composite form of motive and appropriate strategy, and such learning is influenced by students' previous experiences (Bigg, 1996). Furthermore, Bigg (1987) avowed that motivations play an important role to choose learning approach. According to Entwistle and his colleagues (1997), students working on a surface approach to learning focus on materials to be processed. They focus on recalling the facts, definitions and information. The given tasks are seen as separate from students, having no connection with students' life, in broad concept. This learning approach focuses on the completion of the task rather than improving the students learning skills.

Conversely,Entwistle (1991) states deep learning as holistic learning. The deep learning involves delving deep into the subject matter at the aim of extracting personal meaning from the learning task. Moreover, students are presented with challenging facts and problems and try to integrate these into the broader contexts of their personal experience and prior knowledge (Entwistle, 1981). In this way, students

reconstruct their own framework, or schema, in the presence of new information. This continuous process is used to integrate the information into established learning network with meaningful connections. Thus, student's preference of learning approach (surface approach or deep approach) determines the achievement of learning outcome.

Product factors describe the students' performance in the final grade or reaction to the learning process. Bigg (1987) addressed the product component in detail, clearly dividing affective learning outcomes from the more traditional methods for examining knowledge and performance ability (as cited in Jones, 2002). However, this is somehow changed in 1999.

Based on this theoretical framework, the researcher modified this model as shown in figure I. The model incorporated several factors associated with good practice of learning process:



(Source: Bigg's 3P model, 1999)

In this framework, student's preference of learning affected by presage factors in which three factors are included. Students related factors included a previous performance in mathematics, motivation towards learning mathematics and home background. Learning contexts includes workload of students, teaching styles or methods used in classroom, meaningful peer interaction and assessment procedures for students learning. Perception of students toward the teacher's teaching styles and their assistance in classroom learning partially belongs to process factors because assistance is necessary forthe learning process.

Process factors include the student's preference for learning approach in which deep and surface learning is emphasized. Each presage factor affects process factors. Finally, product factors include students' performance in mathematics and on which students related factors and process factors directly impact. However, other factors of presage influences indirectly or through process factors.

Chapter III

Methods and Procedures

This chapter presents the design of the study which was adopted in the research process, population and sample of the study, data collection tools, data collection procedures and data analysis process.

Design of the Study

The researcher used the survey methods in this study, which is a quantitative research method. The survey method gathers data from a relatively large number of cases at a particular time (Best & Khan, 2006). More specifically, in this study, a descriptive survey was implemented in order to collect data from the sampled group. A descriptive survey attempts to establish the range and distribution of some social characteristics, such as education or training, occupation, and location, and to discover how these characteristics may be related to certain behaviour patterns or attitudes (Iowa Research Online, 1981). It is useful to assess the educational practice, beliefs and phenomena at one point of time. It is concerned with the statistics that result when data are abstracted from a number of individual cases. Thus, the researcher used a survey design, particularly, a descriptive survey design in order to explore what factors affect student success in mathematics.

Population and Sample of the Study

The students of grade 10 of academic year 2076 those studying in Roshi Rural Municipality (Kavrepalchok District) of Province 3, Nepal was considered as the population of the study. Based on the systematic sampling process 80 students from two schools were selected as the sample of the study.

Data Collection Instruments

In order to collect primary data, the researcher usea questionnaire and interview as the data collection tools.

Questionnaire. The researcher used the questionnaire developed by Kizito et al (2015) in this study. The researcher reduced and modified the dimensions of the questionnaire in order to use in this study. The researcher adopted the four dimensions in the questionnaire, namely, students related factors, perceptions of students, learning contexts and students' preference of learning. The questionnaire consisted only 36 across the four dimensions. The distribution of the items across each dimension of the questionnaire is presented in the following Table 1:

***Table 1*: Distribution of items across the sections of the questionnaire**

Sections	Student factors	Perceptions of students	Learning Contexts	Students preference in learning
No. of items	14	4	13	5

Interview Schedule: The researcher used semi-structured interview 10 teachers in order to collect data related to the factors that affect students' success in mathematics. That is, the interview wasused for enriching the data collected from the questionnaire. There were 8 open-ended questions.

Doucment Analysis: The researcher used the previous performance of the sampled students to observe how different factors affect students' success in mathematics regarding final achievement. In this study, the researcher gathered mid-term examination records of students which was three months before the final examinations. Then the researcher collectedthe final results of students in mathematics.

Reliability and Validity of Tools

The researcher developed a set of a questionnaire comprising 40 items and then that set of the questionnaire waspiloted in a group of 25 representative students of the study but didnot include in the sample of the study. The researcher used the questionnaire developed by Kizito et al (2015) in this study. The researcher calculated reliability coefficient using SPSS 16.0 setting 0.05 level of significance. Then the reliability coefficient of the questionnaire was interpreted by the interpretation criteria provided by George and Mallary (2003, 231). Furthermore, the researcher ensured the validity of the questionnaire by expert judgement.

Data Collection Process

The researcher requested for conducting the study in the selected schools. After granting permission to conduct study and consent between the researchers, and the school allied personnel, the researcher begun the data collection from students. The researcher gathere students achievement in the mid-term examination results of a group of 30 students from two schools. Then the researcher distributed a set of a questionnaire consisting of 32 items among 30 students of grade 10 whose mid-term achievement was recorded and the researcher provided useful instruction about how to fill up the questionnaire. More importantly, the researcher translated the questionnaire into understandable language, while students were assigning each item. Then the researcher collected the questionnaire from the students.

After two months, the researcher collected the students' achievement in mathematics in the final examinations. Then, the researcher asked for mathematics teachers to conduct an interview with them. After consent between 10 teachers of mathematics and the researcher, the researcher conductedan interview with them. The interview data was recorded on a mobile phone.

Data Analysis and Interpretation Procedures

After data collection, the researcher used a computer to record the data. Then the researcher used computer software to analyse the data. The researcher used descriptive and inferential statistics to analyse the data. In fact, the researcher analyzed the questionnaire data obtained from questionnire calculating correlation and regression using SPSS16.0 setting 0.05 level of significance. More specifically, the researcher used a standard regression model to observe how different factors affect students' success in mathematics. For this, the researcher converted the questionnaire data into an interval scale using SPSS 16.0. Then the researcher performs regression.

The interview data was analyzed based on the thematic approach using NVivo 12 Plus in which the researcher generated nodes and codes using the interview transcript in order to get primary themes. Finally, the researcher added the interview data with the dimensions of the questionnaire.

The sampling frequency was tested for normality. The researcher tested the normality of the data to validate the analysis method used in this research using SPSS 16.0. A Shapiro-Wilk's test ($p>0.05$) and visual inspection of its histogram, normal Q-Q plot and box plot of each section of the questionnaire showed that the data were approximately normally distributed.

Chapter-IV

ANALYSIS AND INTERPRETATION OF DATA

This chapter presents and discusses the results of the research. After acquiring the data from research venue using the questionnaire, and interview with the participants, the researcher started to analyse the data and answer the research questions. The researcher employed various statistical methods to analyse the data. The analysis of the data completed in two comparative phases. The researcher analysed the questionnaire data, and to supplement and enrich the information that was drawn using questionnaire, the result of the interview was described in the second phase.The researcher analyzed the data in the following headings:

The sampling frequency was tested for normality. The researcher tested the normality of the data to validate the analysis method used in this research using SPSS 16.0. A Shapiro-Wilk's test ($p>0.05$) and visual inspection of its histogram, normal Q-Q plot and box plot of each section of the questionnaire showed that the data were approximately normally distributed.

Student Factors

Students factors refer to the influencing factors of success in mathematics that are related to the individual students. There are 14 items in this section with reference to the three variables, namely prior performance in mathematics, motivation and home background. There are discussed below:

Home background. Home background refers to family environment such as large family and facilities available to each family member. There were 9 statements related to this variable of the study. The measure of regression was used to determine how home background affects the students' performance in mathematics. A

significant regression equation was found (f (1,78) = 1.828, $p < 0.01$), with R^2 of 0.93. The predictor (Independent Variable) accounted for 93 % of variance in mathematics scores. The Beta coefficient of the home background was 0.27. It means that 27 % students' achievement in mathematics was affected by home background. Students predicated that mathematics achievement is equal to 0.86 +1.05 (home background).

Prior Performance in Mathematics. Prior performance in mathematics refers to students' achievement on mathematics prior to join this grade 10. It comprised single statement in this study. The measure of regression was used to determine how home background affects the students' performance in mathematics. A significant regression equation was found (f (1,78) = 742, $p < 0.01$), with R^2 of 0.85. The predictor (Independent Variable) accounted for 85 % of variance in mathematics scores. The Beta coefficient of the prior knowledge in mathematics was 0.92 It means that 92 % students' achievement in mathematics was affected by prior knowledge in mathematics. Students predicated that mathematics achievement is equal to 20.33 +7.68 (Prior Performance in mathematics).

Motivation. Motivation refers to the driving force behind all the actions of the individual students. The motivation varies by the sort of individual needs and desires that have a strong impact on the students' way of behaving. The motivation can be influenced by different internal and external forces. There were four statement related to this variable. The measure of regression was used to determine how motivation affects the students' performance in mathematics. A significant regression equation was found (f (1,78) = 498.05, $p < 0.01$), with R^2 of 0.78. The predictor (Independent Variable) accounted for 78 % of variance in mathematics scores. The Beta coefficient of the motivation was 0.88. It means that 88 % students' achievement in mathematics

was affected by motivation. Students predicated that mathematics achievement is equal to 11.04 +11.9 (motivation).

Perception of Students

Perception of students refers to how students understand the teaching and their assistance in mathematics learning. There were four statements with one variable related to this section of the questionnaire, which is discussed below:

Teaching and Assistance. Teaching and Assistance refer to teaching activities held in mathematics class and teacher's assistance in solving mathematics related problems. There were 4 items related to this variable. The measure of regression was used to determine how teaching and assistance in mathematics learning affects the students' performance in mathematics. A significant regression equation was found ($f(1,78) = 36.66$, $p < 0.01$), with R^2 of 0.21. The predictor (Independent Variable) accounted for 21 % of variance in mathematics scores. The Beta coefficient of the Teaching and assistance was 0.46. It means that 46 % students' achievement in mathematics was affected by home background. Students predicated that mathematics achievement is equal to 28.8 +4.24 (Teaching and Assistance).

Learning Contexts

Learning Contexts refer to the circumstances of learning mathematics with respect to students' achievement. There were 13 items in this section of the questionnaire with reference to four variables, namely work load, teaching methods, peer interactions and assessment. These are discussed below:

Work Load. Work load refers to amount of work that teacher of mathematics assigns to the students for the purpose of improving students learning. There were 2 statements related to this variable. The measure of regression was used to determine how work load affects the students' performance in mathematics. A significant

regression equation was found (f (1,78) = 57.4, p < 0.01), with R^2 of 0.30. The predictor (Independent Variable) accounted for 30 % of variance in mathematics scores. The Beta coefficient of the work load was 0.54. It means that 54 % students' achievement in mathematics was affected by work load. Students predicated that mathematics achievement is equal to 34.27 +3.86(Workload).

Teaching methods. Teaching method is the instructional way of delivering content to the students. There were 7 statements related to this variable. The measure of regression was used to determine how Teaching methods affects the students' performance in mathematics. A significant regression equation was found (f (1,78) = 488.5, p < 0.01), with R^2 of 0.78. The predictor (Independent Variable) accounted for 78 % of variance in mathematics scores. The Beta coefficient of the teaching methods was 0.88. It means that 88 % students' achievement in mathematics was affected by teaching methods. Students predicated that mathematics achievement is equal to 8.2 +15.05 (Teaching Methods).

Peer Interactions. Peer interaction is a group interaction in which students share their solutions to peer groups. There were two statements related to this variable. The measure of regression was used to determine how peer interaction affects the students' performance in mathematics. A significant regression equation was found (f (1,78) = 1.828, p < 0.01), with R2 of 0.93. The predictor (Independent Variable) accounted for 93 % of variance in mathematics scores. The Beta coefficient of the peer interaction was 0.27. It means that 27 % students' achievement in mathematics was affected by peer interactions. Students predicated that mathematics achievement is equal to 0.86 +1.05 (Peer Interactions).

Assessment. Assessment refers to the techniques for measuring achievement of students in mathematics. It also indicates both continuous assessment and final

assessment. There were two statements related to this variable. The measure of regression was used to determine how assessment affects the students' performance in mathematics. A significant regression equation was found ($f(1,78) = 242$, $p < 0.01$), with R^2 of 0.64. The predictor (Independent Variable) accounted for 64 % of variance in mathematics scores. The Beta coefficient of the assessment was 0.80. It means that 80 % students' achievement in mathematics was affected by assessment. Students predicated that mathematics achievement is equal to 7.90 +19.29 (Assessment).

Students Preference of Learning

Students learning preference is the way by which students learn mathematics in their own pace and methods. There were five statements related to this section of questionnaire.

Deep vs surface learning. The essence of deep learning is understanding, true knowing. The measure of regression was used to determine how learning preference affects the students' performance in mathematics. A significant regression equation was found ($f(1,78) = 744.72$, $p < 0.01$), with R^2 of 0.85. The predictor (Independent Variable) accounted for 85 % of variance in mathematics scores. The Beta coefficient of the Learning preference was 0.92. It means that 92 % students' achievement in mathematics was affected by learning preference. Students predicated that mathematics achievement is equal to 11.75 +12.21 (Deep versus Surface).

Correlations Between Presage, Process and Product Related Variables

The correlation was calculated to measure relationship among different variables. Preliminary analysis was performed to ensure no violation of the assumptions of normality, linearity and homoscedasticity The correlation among such variables is presented in the following Table II:

***Table 2*: Correlation Matrix**

Prior Performance in math	1.00								
Home Background	0.79	1.00							
Motivation	0.67	0.70	1.00						
Teaching and Assistances	0.58	0.19	0.68	1.00					
Workload	-0.81	0.43	0.60	0.6	1.00				
Peer Interaction	0.42	0.49	0.70	0.52	0.67	1.00			
Assessment	0.40	0.08	0.51	0.75	0.70	0.30	1.00		
Teaching methods	0.63	0.11	0.91	0.89	-0.5	0.64	0.63	1.00	
Deep versus Surface learning	0.55	0.3	0.74	0.81	0.65	0.56	0.35	0.64	1.00

Table 2 reveals a number of positive correlations. There was positive correlation between the two variables $r = 0.79$, $n = 80p < .001$, with prosperous family associated with prior performance in mathematics, however, it does less correlate with teaching methods used in mathematics classroom ($r = 0.11$, $p < 0\ 05$). Furthermore, assessment does not strongly correlate with home background of the students.

The Table 2 also reveals a positive correlation was observed between learning preferences in mathematics learning (deep versus surface learning approach) with the followingvariables: workload ($r=0.31$, $p < 0.05$), motivation ($r= 0.74$, $p<0.05$), teaching methods ($r = 0.48$; $p = 0.001$), teaching and assistance ($r = 0.81$, $p < 0.01$). and teaching methods ($r = 0.54$; $p = 0.001$). A positive correlation was found between

teaching methods and support/satisfaction (r = 0.33; p = 0.001).

Students' Perception Towards Learning Focused Activities

The researcher used the questionnaire developed by Bigg et al (2001) to identify students' perceptions towards their own learning preferences in mathematics. There were 12 items in this perception scale in terms of deep and surface learning preferences. For the purpose of analysis, the researcher reduced the five point Likert scale into three point. The frequency of each item were calculated in terms of responses assigned by students. The result of each item was derived based on mean and frequency. The researcher interpreted mean with reference to interpretation criteria provided by Hull and Wie 1989 (as cited in Arthur, 2010). Students perception towards learning focused activities in mathematics is presented in the

Table 3: **Students Perception Activities**

Statements	A %	B %	C %	D %	E %	Results
1. I see no point in learning material which is not likely to be in the examination	25	15	50	10	0	Positive
2. I find the best way to pass examinations is to try to remember answers to likely questions.	78	0	22	0	0	Positive
3. I come to most classes with questions in mind that I want answering.	28	65	3	2	2	Positive
4. I make a point of looking at most of the suggested readings that go with the lectures.	6	78	8	6	2	Positive
5. I find that at times studying gives me a feeling of deep personal satisfaction.	85	0	2	5	8	Positive
6. I find that I have to do enough work on a topic so that I can form my own conclusionsbefore I am satisfied.	0	45	45	0	10	

7. My aim is to pass the course while doing as little work as possible.	90	0	8	2	0	Positive
8. I only study seriously what's given out in class or in the course outlines.	98	0	2	0	0	Positive
9. I feel that virtually any topic can be highly interesting once I get into it.	85	3	5	2	5	Positive
10. I find most new topics interesting and often spend extra time trying to obtain moreinformation about them.	5	75	8	2	10	Positive
11. I do not find my course very interesting so I keep my work to the minimum.	5	10	0	0	85	Positive
12. I learn some things by rote, going over and over them until I know them by heart evenif I do not understand them.	12	25	35	13	5	

Where, A = never or only rarely true

B = sometimes true of me

C = about half the time

D = frequently

E = always or almost always

The above table shows, almost all, about 98 % of them, students responded that students were only serious on course related contents that is provided in the classroom. Majority of the students indicated that the virtually designed classroom were more interesting for math learning. However, sometimes they could be undecided to either understand the mathematical content or use rote learning for getting high score in the examination.

The above table shows the hindering factors that influence the implementation of collaborative learning in mathematics learning. It is clear that lack of enough time for students centred activities in mathematics classroom is considered as most serious

problems. Unlikely, seating arrangement and addressing the diversity in the mathematics classroom are not serious problems.

In detail, almost all, about 95% of them, teachers responded that shortage of time for collaboration is serious problem to implement collaborative learning successfully in mathematics. Majority of the teachers indicated that the paradigm shift is also challengeable. However, space limitation and trustiness toward the group activities are not so serious problems.

Chapter V

Discussion on Findings

This chapter presents brief summary of the research and then the discussion on the findings of the research based on primary and secondary data obtained.

Discussion on Findings

This was cross-sectional survey design to measure the factors affecting students' success in mathematics. The objective of this study was to measure how different factors affect students' success in mathematics. This study was completed in Sindhupalchok District (Roshi Rural Municipality) of Nepal taking 80students of grade 10. The researcher used questionnaire having 36 items with 4 dimensions, and students' achievement of previous grade as the data collection tools.

The reliability of the data collection tools was ensured by performing Excel 16.0 and validity of the tools was determined by subject expert. The data collection process took one month and the data was collected in three phases. First phase of data collection was administration of the questionnaire among the students to identify the factors. The second phase of data collection started in, after the result of secondary education examination and the researcher collected performance of students in mathematics at final form of examination. The researcher performed Excel 16.0 to measure how students' achievement would be explained by different factors. The researcher used secondary form of data to organize the literature review. The researcher used standard regression model for the purpose of identifying how different factors affects students' achievement.

Based on the analysis of the data, the researcher found that more needs to be known about students' perceptions of their unsuccessful and successful learning in mathematics, including the affective factors that would help to enable positive shifts in students' learning experiences (Howard & Whitaker, 2011). For example, motivation is a commonly recognized factor that distinguishes between students' unsuccessful and successful learning experiences in mathematics (Howard & Whitaker, 2011). In order to better understand how developmental programs can support students to develop positive mathematical identities, in this study the researcher carefully examined students' attitudes toward mathematics and learning mathematics. The researcher also studied the effect that their experiences in mathematics courses had on their attitudes, beliefs, and motivation.

The environment and the personal characteristics of learners play an important role in their academic success. The school personnel, members of the families and communities provide help and support to students for the quality of their academic performance. This social assistance has a crucial role for the accomplishment of performance goals of students at school (Goddard, 2003). Besides the social structure, parents' involvement in their child's education increases the rate of academic success of their child (Furstenberg & Hughes, 1995).

The home environment also affects the academic performance of students. Educated parents can provide such an environment that suits best for academic success of their children. The school authorities can provide counseling and guidance to parents for creating positive home environment for improvement in students' quality of work (Marzano, 2003). The academic performance of students heavily

depends upon the parental involvement in their academic activities to attain the higher level of quality in academic success (Barnard, 2004).

There are some key findings that are listed below:

- Work load and motivation were highly correlated.
- Teaching methods and home background were not correlated.
- Prior knowledge in mathematics had positive and moderated correlation with home background of the students.
- The motivation and prior knowledge in mathematics had highly influenced on students' final grade.
- Workload did not contribute to the final grade of students.
- Peer interaction had valuable proportion of contribution to the final achievement of students in mathematics.

Chapter VI

Conclusion and Reccommendations

This chapter presents the conclusion of the research based on the data analysis presented in chapter IV and the discussion on the findings presented in chapter V. Then this chapter also presents the recommendation for the future research.

Conclusion

There are various factors inside and outside school that contribute for the quality of academic performance of students. The key aspect for the educators is to educate their students effectively so that they may be able to show quality performance in their academics. To achieve this objective it is necessary for the educators to understand better about the factors that may contribute in the academic success of students.

Bigg's 3P model is useful as a framework for analysing factors that affect student performance. It is also used the model to respond to the three research questions posed at thebeginning of the study.For the first part which sought to identify factors that affect student performancein mathematics, it refers to the three sets of interacting variables, namely presage, process andproduct. Student perceptions of the presage factors (teaching quality, teaching methods andworkload) and students'APLemanated as strong predictors of student performance. Studentperception of the workload had the strongest correlation with mathematics achievement.Regarding the second part about pinpointing factors that can be used to predictstudent performance in mathematics, the teaching methods factor appears to

have predominancein the sense that it affects many of the other factors and has the strongest correlation toteaching quality, APL and workload. From these observations, the teaching methods factorwould appear to play a pivotal role in student performance. However, none of the identifiedfactors would independently predict student performance.As a response to the last research question, current findings provide some guidanceto inform the development of protocols and strategies to improve teaching and studentachievement in mathematics.

Educational Implication

The results of this study may lead valuable insight into the improving the national achievement of the students in mathematics and giving the worth in applying the collaborative learning for mathematics in the classroom. The result of this study has a wide range of application from curriculum designer to the actual implementersof mathematics. Based on the findings and conclusion of the study, the following are the significant implication:

- Ensuring that students are made aware of the required workload commitments ifthey are to succeed in the course. Paying attention to the motivational aspects of thecourse could be used to ensure that students see the relevance and value of studyingthe course and are committed to self-regulate when faced with challenging tasks.
- Developing appropriate teaching methods in terms of levels of complexity andsignificance of the concepts and skills being introduced.
- Methodically obtaining data about student performance on the homework assignments,quizzes and examinations and using the information to improve the teachingquality.

- Identifying strategies to encourage students to adopt deep APL such as peer coachingand the use of available student support services to improve performance.

Implication for Further Research

This study has focused on the teachers' perception collaborative learning in mathematics classroom based on mixed method design including small sample size from school mathematics teachers in Kavre District. The other researcher may carry out the study based on the considerable sample and the other context or settings to encourage student centred learning in the mathematics classroom. Based on the experience of this study, the researcher has made the following recommendations for the further study:

- It is recommended that further study may be carried out to find out students' perception and perceptions toward the students centred learning in the mathematics classroom.
- It is recommended to evaluate the prescribed methods and activities of mathematics learning by the principles of Active learning.
- The further research should try to examine the causal impact of the use of Bigg's model of learning on the students' different level of mathematical thinking, and reasoning. So, future study may be carried out to examine how use of Bigg's model of learning supports to teach the hard to teach aspects of mathematics such as theorem proving and problem solving.
- It is recommended to explore the way through which students are assessed in active learning approach.

- It is recommended that further study may conduct on evaluating mathematics teachers' professional development regarding the implementation of students centred learning in the mathematics classroom.
- Although this study was conducted among the teachers of mathematics to assess their perceptions towards the use of collaborative learning in mathematics. An additional research is needed to explore the students' perceptions and perceptions towards the use of collaborative learning in mathematics teaching and learning.

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Appendix: A

Students' Perception Towards Learning Focused Activities

Statements	A %	B %	C %	D %	E %	Results
1. I see no point in learning material which is not likely to be in the examination	25	15	50	10	0	Positive
2. I find the best way to pass examinations is to try to remember answers to likely questions.	78	0	22	0	0	Positive
3. I come to most classes with questions in mind that I want answering.	28	65	3	2	2	Positive
4. I make a point of looking at most of the suggested readings that go with the lectures.	6	78	8	6	2	Positive
5. I find that at times studying gives me a feeling of deep personal satisfaction.	85	0	2	5	8	Positive
6. I find that I have to do enough work on a topic so that I can form my own conclusions before I am satisfied.	0	45	45	0	10	
7. My aim is to pass the course while doing as little work as possible.	90	0	8	2	0	Positive
8. I only study seriously what's given out in class or in the course outlines.	98	0	2	0	0	Positive

9. I feel that virtually any topic can be highly interesting once I get into it.	85	3	5	2	5	Positive
10. I find most new topics interesting and often spend extra time trying to obtain more information about them.	5	75	8	2	10	Positive
11. I do not find my course very interesting so I keep my work to the minimum.	5	10	0	0	85	Positive
12. I learn some things by rote, going over and over them until I know them by heart evenif I do not understand them.	12	25	35	13	5	