# Mathematics Achievement of Ethnic Group Students: A Quantitative Study in Banke District

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**Abstract:**

The study investigated the mathematics achievement of ethnic group students. The main objectives of this study were to seek mathematics Achievement of Tharu and Muslim ethnic groups on cognitive level: Knowledge, Skill, Comprehension and Application of grade nine students of Banke district. Achievement test was taken to get the required information. It was taken among 240 students on both ethnic group students. Two tailed t-test at 0.05 level of significance was used to analyze the collected data. The finding of this study shows that the Tharu ethnic group students were found to be significantly better in mathematics than the Muslim students on the Knowledge, Skill, and Comprehension. But there is no significant difference in the Application level in both groups of students.

*Keywords:* Achievement, Cognitive domain, Ethnic group, Mathematics and Achievement test

## Introduction

Nepal is a multilingual, multicultural, and multi-religious country. It is diverse in terms of geographically, linguistically, caste-wise, racially, religiously, and culturally. There are 36 distinct languages spoken by at least 35 different ethnic groups and 36 different castes. This indicates that a diverse range of socioeconomic, cultural, and ethnic groups are represented in Nepal's schools. In this situation, the teaching and learning activities in the mathematics classroom often become challenging work for the teachers (Acharya, 2015, p. 1). Many teachers still have traditional teaching and learning activities, which is one of the major causes of low motivation and lack of interest of students in learning mathematics (Rawat, 2018). As a result, students acquire a weak background in mathematics, which negatively affects their performance. The National Council of Teachers of Mathematics (NCTM) has identified some issues with mathematics learning. These characteristics are: slow or incorrect recall; impulsiveness in problem-solving; difficulty representing concepts; poor development of number sense; and a problem with working memory(NCTM, 2007). Particularly for low achievers, these characteristics can be used to pinpoint students' challenges and difficulties when studying mathematics.

Maskeyn (1972) has conducted a study on "A comparative study of mathematics achievement of primary schools' students under different class sizes. The objective of this study was to determine the effect of the class size in the achievement of the students in mathematics of grade three of primary school. The finding of the study showed that the students studying in small class have higher achievement than the students studying in large class size. Bajracharya (1991) studied the relation of social class, religion, family size and birth order to academic achievement of high school students. The study investigated the relationship of socio-economic status and certain demographic factors and religion with the academic achievement. The finding showed that students belonging to different social classes differed in their academic achievement and Hindu, Muslim and Christian students differed in their academic scores. Similarly, the performance of students will depend on the entire cultural value system and the role of education within that system(Chen & Uttal, 1988). Shrestha (1991) has conducted a study on the topic, "A study of sex difference in achievement in mathematics of grade nine students in Gorkha district. The objective of the study was to determine the sex influences achievement in mathematics. He prepared two sets of tools which are achievement test and questionnaire and administered them to two hundred eighteen students of five schools. He applied t-test to analyze the data. The finding the study showed that:

- Boys devote more time than girls as home study.
- Boys performed better than girls in mathematics.

Toole (2001) has investigated on explaining mathematics achievement by examining its relationship to ethnic background, gender and level of formal reasoning. The findings indicated that there was a moderate correlation between formal reasoning level and achievement and also with ethnic background and achievement. There was a very low correlation between gender and achievement. The study also concluded that reasoning and ethnic background have an impact on achievement in mathematics. Gender does not have any impact on achievement in mathematics.

An ethnic group or ethnicity has been defined in numerous ways. John and Smith (1996) defined of an ethnic group, or ethnic, consists of six main features that include:(i) A common proper name, to identify and express the "essence" of the community; (ii) A myth of common ancestry that includes the idea of common origin in time and place and that gives an ethnic groups a sense of fictive kinship; (iii) Shared historical memories, or better, shared memories of a Common past or pasts, including heroes, events, and their common past or pasts, including heroes, events, and their (iv) One or more elements of common culture, which need not be specified but normally include religion, customs, and language; (v) A link with a homeland, not necessarily its physical occupation by the ethnic, only its symbolic attachment to the ancestral land, and (vi) a sense of solidarity on the part of at least some sections of the ethnic's population. In a broader context, Berreman (1972) and Berreman and Zaretsky (1981) defined ethnicity as one level of social stratification or social inequality that also includes race, class, kinship, age, estate, caste, and gender. Berreman and Zaretsky (1981) provided clear distinctions between ethnicity and race or class. Ethnicity is linked in a dichotic relationship with race. It is

differentiated from race in that racial stratification is associated with birth-ascribed status based on physical and cultural characteristics determined by outside groups. Ethnicity is also ascribed at birth, but the ethnic group is normally defined as its cultural characteristics. Thus, racial categorizations, which are defined by the outsiders, are normally laced with inaccuracies and stereotypes, while ethnic classification is normally more accurate of a cultural group because it is defined by the group itself. Yet, ethnic classifications can also be defined and used by outside groups to stereotype an ethnic community in ways that are often oversimplified and that views ethnicity as a static cultural process. Ethnicity is differentiated from class in that "social class membership and ranking is based on attributes regarded to extrinsic people who comprise the class, such as amount of income, occupation, education, consumption patterns, and 'life-style'" (Berreman & Zaretsky, 1981).

Thus, an individual's class is not predetermined at birth; an individual's accomplishments during his or her life can help an individual to rise or fall in social status within the community. Culture influences upon learning mathematics. Culture related problems in learning are seldom caused by deficiencies in particular cultures; they are usually caused by teacher's failures to understand and value the cultures of their students. Straus and Straus (1968) observed that culture is one of the important variables which strongly influence creative thinking abilities. Singh (1985) has attempted to identify the effect of culture on mathematical creativity of two religious groups and found a significant difference between urban and rural Hindu and Muslims. Stevenson et al. ( 1986)pointed out that cross cultural differences in mathematics performance before kindergarten; early environmental manipulations may have especially strong impact on subsequent achievement. Chen and Uttal (1988) also found that environmental factors operate among different cultures.

In the context of Nepal and other countries, from the review of some studies indicates that achievement in mathematics is affected by the variables such as class size, education and economic status of parents', gender, religious, cultural value, geographical and ethnic group. While this study is to prime important to analyze the comparative mathematics achievement of grade nine students of Tharus and Muslims on the basis of four level of cognitive domain such as knowledge, skill, comprehension and application in Nepal.

**Objective of the Study**
The objectives of this study were as follow:
- To find out the mathematics achievement of grade nine students of Tharu and Muslim ethnic groups.
- To identify the difference in mathematics achievement of Tharu and Muslim ethnic group on cognitive level: Knowledge, skill, comprehension and application.

**Research Hypotheses**
- There is no significant difference in the mean scores between Tharu and Musalim students

- There is no significant different between mathematics achievements of cognitive level wise on both ethnic groups students.

## Method and Procedure of the Study

Research method is a way to systematically solve the research problem. It may be understood as the science of studying how research is done scientifically (Kothari & Gary, 2014). It describes the design of the plans and procedures of the study which were carried out to achieve the objectives of the study. This study was designed to seek the mathematics achievement of Tharu and Muslim ethnic groups on a cognitive level: knowledge, skill, comprehension, and application of grade nine students of Banke district. The present study applied the quantitative survey design of educational research as adopted for the completion of the study. This paper's population consisted of all students in grade nine from government and private schools in the Banke district. According to the statistics made available by the District Education Office of Banke, there were thirty-nine government higher secondary schools and thirty-one private higher secondary schools in Banke. The schools were divided into two strata, which were government and private schools. Four schools were selected from each stratum by using a purposive random sampling procedure. The sample size of students in this study was 240. They were selected from selected schools through simple random sampling where each ethnic group had the same number of students. The achievement test paper was used for the required data collection for this study.

## Data Collection and Analysis Procedure

The researcher made the decision to create his own tool. Initially, 120 multiple-choice items in various levels of the cognitive domain of ninth grade mathematics were created. Then item analysis was used. On the basis of item analysis, 100 items were accepted for the final form. The final test contained 25 items of knowledge, 25 items of skill, 25 items of comprehension, and 25 items of application level. After that, the final tool was done. For the analysis of obtained data, means and standard deviations were calculated, and a two-tailed t-test was used. All hypotheses were tested for their significance at a 0.05 alpha level.

## Results and Discussion

**Table 1**

*Mean Scores of Tharu and Musalim students*

| Ethnic Groups | N | Mean | S.D. | t-value | Sig.(2-tailed) | Result |
|---|---|---|---|---|---|---|
| Tharu | 120 | 6.35 | 2.34 | 4.44 | 0.00 | 1.96 < 4.44 |
| Musalim | 120 | 5.15 | 1.80 | | | |

Significant at 0.05 level

N = Number of Students

M = Mean, SD = Standard Deviation d.f.= N1+N2-2 = 120+120 -2 = 238

Tabulated Value ($t_{0.05,238}$) = 1.96 (two tailed test)

The analysis of the information mentioned in Table 1 indicates that there were 120 Tharu students and there were 120 Musalim students. The mean score obtained by the Tharu students was 6.35, and the standard deviation (SD) was 2.34. Similarly, the mean score of the Musalim students was 5.15 and the standard deviation (DS) was 1.80. Therefore, the mean score of the Tharu students was higher than the mean score of the Musalim students by 1.2. The calculated t-value was 4.44, which is higher than the tabulated value of $t_{0.05,238} = 1.96$, and the p-value was 0.00. Hence, this difference in mean is significant at 0.05 levels. It indicates that there is a difference between the mean score of Tharu students and Musalim students. Therefore, our null hypothesis "There is no significant difference in the mean scores between Tharu and Musalim students" is rejected. Based on the mean scores, the researcher concludes that Tharu students outperform than Muslim students in mathematics.

**Table2**

*Significance Differences in Achievement of Mathematics on Knowledge, Skills, Comprehension and Application*

| Cognitive Level | Mean Scores | | Standard Deviations | | t-values | Results |
|---|---|---|---|---|---|---|
| | Tharu | Musalim | Tharu | Musalim | | |
| Knowledge | 7.63 | 6.01 | 2.01 | 2.oo | 6.27 | significant |
| Skill | 6.21 | 4.50 | 2.25 | 1.98 | 5.61 | significant |
| Comprehension | 6.25 | 5.20 | 2.75 | 1.90 | 3.44 | significant |
| Application | 5.30 | 4.90 | 2.35 | 1.99 | 1.45 | No significant |

The analysis of the information mentioned in above table 2 represents that the mean score on Knowledge of Tharu students was 7.63 and standard deviation was 2.01 whereas the mean score of Muslim students was 6.01 with standard deviation was 2.00. Therefore, the mean score of Tharu students is higher than Muslim students by 1.62. Thus the calculated t-value was 6.27 which is greater than the tabulated value at 0.05 level. Hence this difference in mean is significant at 0.05 level. Thus we concluded that the Tharu students significant better than Muslim students on knowledge level.The mean score on Skill of Tharu students was 6.21 and standard deviation was 2.25 whereas the mean score of Muslim students was 4.50 with standard deviation was 1.98. Therefore, the mean score of Tharu students is higher than Muslim students by 1.71. Thus the calculated t-value was 5.61 which is greater than the tabulated value at 0.05 level. Hence this difference in mean is significant at 0.05 level. Thus we concluded that the Tharu students significant better than Muslim students in the achievemnt on Skill level.The mean score on Comprehension level of Tharu students was 6.25 and standard deviation was 2.75 whereas the mean score of Muslimstudents was 5.20 with standard deviation was 1.90. Therefore, the mean score of Tharu students is higher than Muslim students by 1.05. Thus the calculated t-value was 3.44 which is greater than the tabulated value at 0.05 level. Hence this difference in mean is significant at 0.05 level. Thus we concluded that the Tharu students significant better than Muslim students on Comprehension level.The mean score on Application

level of Tharu students was 5.30 and standard deviation was 2.35 whereas the mean score of Muslim students was 4.9 with standard deviation was 1.99. Therefore, the mean score of Tharu students is higher than Muslim students by 0.04. Thus the calculated t-value was 1.45 which is less than the tabulated value at 0.05 level. Hence this difference in mean is not significant at 0.05 level. Thus we concluded that the Tharu students and Muslim students not significant different on Application level.

## Conclusion

This study seeks out and focuses upon the mathematics achievement of grade nine students of Tharu and Muslim ethnic groups on four cognitive levels: knowledge, skill, comprehension, and application. The results of this study indicate that the students of Tharu ethnicity were found to have significantly better achievement in mathematics than the students of Muslim ethnicity on the knowledge, skill, and comprehension levels, but there was no significant difference between the two groups on the application level. Thus, the Muslim students must use the appropriate learning approaches, which is why they must practice actively in the learning process. Therefore, the future research will be intended to determine the best approach to the learning process to increase the scores of Musalim students.

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