Discerning Bachelor First Year Education Students' Attitudes towards Studying Mathematics as a Major Subject

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ABSTRACT: *Different students from diverse family backgrounds, cultural variations and varied geographical circumstances are attracted towards studying mathematics as a major subject at the bachelor level in Nepal. The main objective of this study is to examine the bachelor first year education students" level of attitudes towards studying as a major subject. A cross-sectional survey design which consisted of a standardized questionnaire of five-point Likert scale question items was administered to the mass of students at five campuses in the academic year 2017-2018 in Dang District of Nepal. Simple random sampling technique was used to select 96 students as respondents out of the population of 127 students for the study. The collected data were statistically analyzed by using SPSS .The study revealed the students' positive level of attitudes (Median > 3 and Mode >3) towards studying Mathematics as a major subject. The Mann- Whitney U Test showed that the distribution of the attitude level was the same across categories of sex (Sig. .826). This research article is assumed to be important for teachers, concerned authorities and parents to discern why the students were interested in studying Mathematics as a major Mathematics in the Faculty of Education.*

KEY WORDS: *attitudes, Mathematics, Dang.*

I. INTRODUCTION

Mathematics is a tough subject. Many Nepalese learners start learning Mathematics from their early stage at primary schools or even pre-schools. Mathematics has been taught as a compulsory subject at the Secondary level. It has been taught as a compulsory subject as well as a major subject at the higher Secondary level and the bachelor level. Moreover, students at the master levels in the faculties of humanities, science and education study Mathematics as a major subject of interest, yet the problem is that most of the students are far from attaining the desired level of proficiency either in comprehensive or productive skills or in both. Although a huge amount of time and effort are spent on teaching and learning activities, most of the learners cannot go beyond the basics or they experience difficulty in developing their level of proficiency in spite of their keen interest in studying Mathematics.

There might be a lot of possible reasons for studying Mathematics as a major subject. Some people have a strong desire to study Mathematics because they think that knowledge of Mathematics offers chances for advancement in their professional lives. They think that they will get a better job if they know Mathematics. Whatever the reasons there may be, the preference of students for studying Mathematics has tremendously increased in the present context in Nepal.

This article tries to examine the bachelor first year education students" level of attitudes towards studying Mathematics as a major subject. A cross-sectional survey design which consisted of a standardized questionnaire of five-point Likert scale 15 question items was administered to the groups of students who belonged to three campuses in Dang District of Nepal in the academic year 2017-2018. Simple random sampling technique, especially lottery method was used to select 96 students as respondents out of the population of 127 students for the study. The five-point Likert scale question items were the units of analysis.

The study units were such questions that tended to highlight the attitudes of students towards Mathematics as a major subject. The analysis of the units was performed on the basis of options given from the ascending level of

attitude as from Strongly Disagree (SD=1) to Strongly Agree (SA= 5).

Dang, which is emerging as an appealing hub for campus education, is a multi-ethnic, multireligious and multi-cultural district. The people of diverse economic positions have been living here. There were only three campuses where students can pursue the bachelor level in Mathematics as a major subject. Major Mathematics in the Education Faculty involves..... Students of this district are motivated towards learning Mathematics as a major subject at campuses. Moreover, students from the Terai, the Valley, and the Hill come to this district for their campus / higher education because of its serene and suitable environment for teaching learning activities. It can be considered that the students of these campuses may represent the students of Education campuses situated in this nation. This research study is significant because it assists the people to discern the students‟ level of attitudes and major reasons having positive attitudes towards studying Mathematics as a major subject.

1.1 Null Hypotheses of the Research Study

The null hypotheses of the research study were:

1.1.1. There is no statistically significant difference in the distribution of attitude level across categories of sex.

1.2 Objectives of the Research Study

The objectives of the research objectives were:

1.2.1 To examine the bachelor first year education students‟ level of attitude towards studying Mathematics as a major subject.

1.2.2 To find out if there is any significant relationship between the students‟ sex and the level of attitude towards studying Mathematics.

II. LITERATURE REVIEW

Literature review encompasses definition of mathematic, views of students and teachers towards learning mathematics , significance of mathematics.

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III. METHODOLOGY

Methodology includes research design, population of the study, sampling design, sample size, nature of data, sources of data, data collection procedure, pilot study, validity and reliability of instruments.

3.1 Research Design

A cross-sectional survey design was used to carry out the study. The researcher collected data to investigate the bachelor first year education students‟ attitudes towards studying Mathematics language from five campuses in Dang District of Nepal at one specific point in time.

3.2 Population / Universe

The population of the study consisted of 127 bachelor first year education students studying at three campuses in Dang District of Nepal in the Academic Year 2017-2018.

Table 1: Population / Universe of the Study

Students	RSC		RBC		DMC		TOTAL		GRAND TOTAL
Number of Participated students	BOYS	GIRLS	BOYS	GIRLS	BOYS	GIRLS	BOYS	GIRLS	
	12	20	11	25	8	20	31	65	96

(RSC: Rapti Shiksha Campus, RBC: Rapti Babai DMC: Deukhuri Multiple Campus

3.3 Sampling Design and Sample Size

Simple random sampling technique / design, especially the lottery method was used to select 96 respondents (45 boys and 51 girls) for the study according to the sample size calculator maintaining the margin of error 5 % and the confidence level 95% from five campuses in Dang District of Nepal.

Fig 1: Number of Students Randomly Selected from Five Campuses

The Figure 1 shows that there were 30 respondents (14 boys and 16 girls) from Rapti Shiksha Campus, 36 respondents (16 boys and 20 girls) from Rapti Babai Campus and 30 respondents (15 boy and 15 girls) from Deukhuri Multiple Campus.

3.3.3 Projection of the Sample Size by Sex

There were 31 male and 65 female students aged between 17- 23 years.

3.3.4 Nature and Source of Data

The researcher employed ordinal scale data which are qualitative in nature. Students‟ attitudes towards Mathematics language were obtained through the use of five-point Likert scale question items with Strongly Agree (SA) =5, Agree (A) = 4, Undecided (UD) = 3, Disagree (D) =2 and Strongly Disagree (SD) = 1. The numbers assigned to them indicated only the order of preference. The primary source of data was questionnaire. The secondary source of data included books, journal articles, web-sites etc.

3.3.5 Data Collection Technique

The modified survey questionnaire was adapted from Gardner's (1985) ‚Attitude Motivation Test Battery‟ (AMTB). The underlying principle of selecting Gardner's AMTB is its established validity and reliability. There were fifteen question items based on attitudes. The students were asked to provide their opinions on the statements regarding their attitudes towards studying Mathematics as a major subject.

3.3.6 Validity and Reliability of the Pilot Study

To measure the validity of the instruments before conducting the research study, the researcher received opinions and judgments from subject experts and authorities. The reliability of the pilot study questionnaire based on the attitudes of thirty bachelor first year education students' attitudes towards studying Mathematics as a major subject was found to be .967 according to the Cronbach‟s alpha, and it was very highly reliable.

3.3.7 Reliability of the instruments of the Research Study

The Cronbach‟s alpha‟ was used to check the reliability of the survey instruments. The overall internal consistency estimated 0.901 highlighting the instrument to be highly reliable in measuring students‟ attitudes towards studying Mathematics as a major subject. .

4. Descriptive Analysis of Data and Results

The researcher designed a series of Likert scale question items to examine attitudes of students towards

studying Mathematics as a major subject. Being the ordinal data, it was appropriate to use mode, median and percentage to describe the scale. All the data were analyzed by using Statistical Package for Social Sciences (SPSS).

4.1 Median

Median is the value that occupies the middle point of a distribution. It is the point that divides the distribution in half. The median of the most of the individual questions must be greater than 3 to reveal the positive attitude towards something in the five point Likert scale question items.

4.2 Mode

Mode is a statistical term that refers to the most frequently occurring number found in a set of numbers or observations. If the mode in most of the individual questions is above 3 in the five point Likert scale question items, it may show the positive attitude towards something.

Table 3: Median and mode of the statement items responded by 96 students

S. N.	Statements / Question Items	Median	Mode	Attitude Level Based on Median
1.	You think that the major Mathematics syllabi prescribed for education students are more practicable than those prescribed for Humanities and Science students.	5	**5**	**SA**
2.	Taking Mathematics as a major subject in the education faculty fulfils your desire for teaching Mathematics.	**5**	**5**	**SA**
3.	You think that your knowledge of Mathematics provides you an opportunity to earn more money when you get involved in some work.	**4**	**4**	**A**
4.	Major Mathematics in the education faculty assists you to enhance mathematical knowledge for teaching.	**5**	**5**	**SA**
5.	You want to be an academic writer to write articles and carry out researches on Mathematics in the days to come.	**4**	**5**	**A**
6.	You want to be a trainer of Mathematics days to come.	**4**	**5**	**A**
7.	You think that learning Mathematics as a major subject in the faculty of Education will help you in higher academic achievement.	**4**	**4**	**A**
8.	You think that learning Mathematics as a major subject in the faculty of Education will open more job opportunities for you.	**5**	**5**	**SA**
9.	Studying Mathematics as a major subject can be important for you because other people will respect you more if you have sound knowledge of Mathematics .	**4**	**4**	**A**
10.	Studying Mathematics as a major subject enables you to participate confidently in academic and teaching- learning activities.	**4**	**4**	**A**

This table shows that median of every attitude question was greater than 3. Similarly, the mode of every question was also greater than 3. Both median and mode values of the questions were greater than 3. The

median and mode values indicate the students' positive attitudes towards studying Mathematics as a major subject. Moreover, the above data also show that the students took education Mathematics as a major subject , because it was more practicable (Q.1), Taking Mathematics as a major subject in the education faculty fulfils your desire for teachingMathematics (Q.2), Major Mathematics in the education faculty assists you to enhance mathematical knowledge for teaching. (Q.4) and You think that learning Mathematics as a major subject in the faculty of Education will open more job opportunities for you. (Q.8).

4.3 Percentage

A percentage is a number or ratio expressed as a fraction of 100. The percentage can be used to describe a change and to make comparison. If the percentages of "Agree" and / or "Strongly Agree" are greater than those of "Strongly Disagree", "Disagree" and "Undecided", they indicate the positive attitude towards something.

Table 4: Level of Attitude of each Question with Number and Percentages

Attitude Level / Questions	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree	Total
Q.1	9 (9.4%)	9 (9.4%)	9 (9.4%)	9 (9.4%)	**60 (62.4%)**	**96 (100%)**
Q.2	1(1%)	4(4.2%)	1(1%)	**39 (40.6%)**	**51(53.1%)**	**96 (100%)**
Q.3	14(14.6%)	9 (9.4%)	11 (11.5%)	**32 (33.3%)**	**30(31.3%)**	**96 (100%)**
Q.4	8 (8.3%)	20 (20.8%)	1(1%)	10 (10.4%)	**57 (59.4%)**	**96 (100%)**
Q.5	10 (10.4%)	2 (2.1%)	16 (16.7%)	**28 (29.2%)**	**40 (41.7%)**	**96 (100%)**
Q.6	6 (6.3%)	11(11.5%)	11(11.5%)	**29 (30.2%)**	**39(40.6%)**	**96 (100%)**
Q.7	7 (7.3%)	11(11.5%)	10(10.4%)	**38 (39.6%)**	**30 (31.3%)**	**96 (100%)**
Q.8	17 (17.7%)	9 (9.4%)	11(11.5%)	8 (8.3%)	**51(53.1%)**	**96 (100%)**
Q.9	7(7.3%)	7(7.3%)	20 (20.8%)	**46 (47.9%)**	16(16.75)	**96 (100%)**
Q.10	0 (0%)	20 (20.8%)	1(1%)	**64 (66.7%)**	11(11.5%)	**96 (100%)**

The Table No.4 shows that percentages of either "Agree" or "Strongly Agree" were greater than those of "Strongly Disagree", "Disagree" and "Undecided" of the questions. This indicates that the students had the positive attitudes towards learning Mathematics as a major subject.

5. Inferential Analysis of Data and Results

This research study adopted Independent Samples Mann-Whitney U Test to perform the inferential analysis of data.

5.1 The Mann-Whitney U Test

It is the nonparametric test selected as the alternative to the Independent Samples T Test. The Mann-Whitney U test uses the data measured at the ordinal level. This test is employed to determine if there are statistically significant differences between two groups of an independent variable on an ordinal dependent variable. In this study, boy students and girl students (Sex) stood for two independent samples or variables or Groups; whereas the attitude level functioned as a dependent variable.

Table 5: Test Fields: Attitude Level & Group: Sex

Hypothesis Test Summary

Null Hypothesis	Test	Sig.	Decision
The distribution of attitude level is the same across categories of sex.	Independent Samples Mann-Whitney U Test	. 826	Retain the null hypothesis

Asymptotic significances are displayed. The significance level is .05.

This Table shows that the probability figure marked as Sig (2-tailed) in the table was .826 which was larger than 0.05. It implies that the distribution of the attitude level towards Mathematics as a major subject was the same across the categories of sex. It accepts the null hypothesis.

6. Conclusion

Median and mode scores of individual questions were greater than 3. Either "Agree" or "Strongly Agree" retained the highest percentage of the attitude level. It shows the students" positive attitudes towards studying Mathematics as a major subject. The research study discerns the main four reasons of the students for taking Mathematics as a major subject: Mathematics in education is more practicable, it fulfills the students „desire for studying Mathematics. The Mann- Whitney U Test shows that the distribution of the attitude level was the same across categories of sex (Sig. 826).

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