

**QUALITATIVE AND QUANTITATIVE ANALYSIS OF FACTOR
IDENTIFICATION FOR THE LACK OF SCIENCE STUDENTS AND
GROUP CHANGING TENDENCY AT SHARIATPUR REGION IN
BANGLADESH**



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DECLARATION

In accordance with rules and regulations of Z. H. Sikder University of Science and Technology following declarations are made:

We hereby declare that the thesis has been done by us under the guidance of our supervisor, co-supervisor and respective teachers of Computer Science and Engineering department at Z. H. Sikder University Science & Technology, Shariatpur.

We also declare that, this thesis nor any part of the thesis has been submitted elsewhere for awarding of any degree and any material reproduced in this thesis has been properly acknowledged.

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ABSTRACT

Education is the social institution through which society provide its members with important knowledge, including basic facts, job skills and cultural norm values. Science education is also a part of education. To prosper in this modern age of innovation requires the capacity to grasp the essentials of diverse problems, to recognize meaningful patterns, to retrieve and apply relevant knowledge. Science education has the potential for helping the development of the required abilities and understanding by focusing on developing powerful ideas of science and ideas about the nature of scientific activity and its applications. In Shariatpur there is huge gap between number of science students and number of other discipline students. There are very less number of science students compared to other discipline students. This study aims to determine the factors influence the students for group changing from science and the lack of science students by considering the opinion among students, student's family and teachers. This study also aims to identify how to increase science students and prove to prevent their group change. This study partitioned into three parts which explores the most significant factors associated with lack of science students and their group changing tendency after taking science and also identify ratio of science discipline students with other discipline students. In this study we used raw data, collected from students, their parents and form their institutions teacher. A sample of 251 students, 251 parents and their teachers were collected. Three groups of students were identified: those who wants to change group in future, who already changed and who don't want to change group in future. Pearson correlation coefficient and multiple linear regression analysis were used in this study. Pearson correlation analysis and multiple linear regression analysis showed that student's family condition, fear of science plays most significant part in lack of science students. Lack of quality institution and lack of quality teacher also plays an important part. That is why number of science students in Shariatpur is very less. Pearson correlation analysis and multiple linear regression analysis results also showed that guardian's income, father education, children's number in a family plays most significant part in students group change, father occupation and mother education also plays a role in students group change. Ratio analysis results showed the ratio between science and other discipline students. This thesis identifies some way which can help to reduce group change and increase number of science students. In the research, we conclude that the reduction of cost in studying science will be create a positive involvement in student for studying science and the group changing tendency also take a nose dive. This kind of research will be helpful for various statistical analysis in education sector in Bangladesh and also paves the way to take proper steps for increasing science students in Shariatpur as well as Bangladesh.

CONTENTS

1. Introduction	1
1.1 Introduction.....	2
1.2 Related Work.....	2
1.3 Motivation.....	3
1.4 Thesis Objective.....	4
1.5 Organization of the Thesis.....	4
1.6 Discussion	5
2. Literature Review	6
2.1 Introduction.....	7
2.2 Thesis Literature.....	7
2.2.1 Statistics.....	7
2.2.2 Field of Statistics.....	7
2.2.3 Importance of Science Education.....	8
2.3 Discussion.....	8
3. Methodology and Data	9
3.1 Introduction.....	10
3.2 Overview of Analytical Approach.....	10
3.3 Data Analysis.....	10
3.4 Methodology.....	10
3.4.1 Analysis methods.....	11
3.4.2 Correlation Analysis.....	11
3.4.3 Multiple linear Regression analysis.....	12
3.4.4 Percentage Calculation.....	14
3.5 Discussion.....	14
4. Results and Discussion	15
4.1 Introduction.....	16
4.2 Percentage Calculation.....	16

4.3 Pearson's Correlation Analysis.....	17
4.3.1 Factors Behind Lack of Science Student	17
4.3.2 Factors Influences Science Students to Change Group.....	18
4.4 Multiple Linear Regression Analysis.....	19
4.4.1 Factors Behind Lack of Science Student.....	20
4.4.2 Factors Influences Science Students to Change Group	20
4.5 Prevention for Lack of Science Students.....	21
4.6 prevention for Students Group Change.....	22
4.7 Discussion.....	23
5. Conclusions	24
5.1 Discussion.....	25
5.2 Future Work.....	25
5.3 Conclusions.....	26
 References	 27

List Of Figures

3.1 Identifying outliers using Boxplots.....	11
3.2 Normal Probability plot.....	13
3.3 Scatter plot.....	13

List of Tables

4.1 Percentage of science students.....	16
4.2 Correlation for lack of science.....	17
4.3 Correlation analysis for group change.....	19
4.4 Multiple Linear regression analysis for lack of science.....	20
4.5 Multiple linear regression analysis for group change.....	21

Chapter 1

Introduction

In this chapter we introduced our thesis overview, related work, motivation, objective and organization. In section 1.1 we discussed about thesis introduction; in section 1.2 we discussed about related work; in section 1.3 we discussed about our thesis motivation; in section 1.4 we discussed about our thesis objective; in section 1.5 we discussed about the whole thesis paper organization; in 1.6 we gave a short description about this chapter.

1. Introduction

Science helps students understanding of the world around them. If students want to shape the world around them, helps make scientific advances that benefit mankind, and prepare for a successful career a science degree will be highly valuable. Shariatpur is a district of Bangladesh, where number of science students in school and college are very less as compared to other discipline students and also after taking science many science students have tendency to change their group. This is very alarming for Shariatpur, as well as Bangladesh. So, a study is required to find out what factors are responsible for lack of science students and their tendency to change group. In the last two decades Shariatpur has witnessed rapid growth of student's quantity. On the demand side, with the growth of the technology, the country needs skilled human resources. On the supply side, due to lack of science students Shariatpur can't supply skilled human resources. There are many factors associated with lack of science students and their group change. Some of the factors belong to the students such as fear of studying science. Some factors belong to the family condition such as parent's education, parent's occupation, yearly income of family and number of child of the family. Other factors belong to institution such as number of quality teacher. In this study we have collected raw data from different institution to find out the factor associated with lack of science students and their tendency for changing group. A sample of 251 students and 251 parents and teacher have used in this study. Group of three students were identified - 1) Those who already changed group, 2) Those who wanted to change group in future, and 3) Those who didn't want to change group. Our thesis take a close look at the at students situation in family and school in order to bring new evidence of reasons why students changed their group and also why do they want to change group in future? Finding out whether they have critical family condition than the students who don't want change group or they get less quality teacher and institution.

1.2 Related Work

Different researches have worked on Students drop out from institutions. In this section we focused on some analysis on students drop out from reference section.

Authors in paper [1] named School drop out in Bangladesh: Insights using panel data explores the factors associated with school dropout. By using multivariate logit model, authors have showed age and gender together with financial constraints, such as lack of income and school expenditure as the top predictors of school dropout. This paper identifies some possible

interventions that could reduce school dropout. Authors in paper [2] named Dropping out of high school in the United States: An observational study estimated the effect that dropping out has on cognitive achievement test scores. Each sampled drop out from a school is matched by a multivariate procedure to a student who remained in the same school. Author then adjusted matched pair differences using analysis of covariance. Authors in paper [3] named Dropouts at the Tertiary Level in Bangladesh: A Case Study in Asa University Bangladesh focuses on mapping out the factors that work behind students dropping out of private universities in Bangladesh. Authors have resorted mixed method qualitative as well as quantitative to identify responsible factors for female dropping put such as child birth and early marriage, students underperforming in exams and not getting good results for both male and female. Authors in paper [4] named Economic effect of school dropout in Bangladesh determined the economic effects of school drop out in the context of Bangladesh also explores the factors associated with school dropout. This paper revealed that the school dropout is negatively related to economic development in Bangladesh. This paper also explored that chronic poverty, parent's unwillingness, financial problem, school's poor infrastructure, biased social practice, lack of quality education, unequal access to education and security problems for girls are major causes of school drop in Bangladesh. Authors in paper [5] named Marriage market and an effect on girls' school dropout in Bangladesh created a conceptual framework on the mechanism of hypergamy and dowry to illustrate how girls schooling continuations increase the amount of dowry in marriage market to find out the underlying factors of girls dropout. Logistic regression model is used in this paper to confirm that parent's dowry payment expectation and their hypergamic intentions both are negatively predict girl's school dropout outcome in Bangladesh. Authors in paper [6] named The Impact of socio-cultural factors on dropout rates for girls at the secondary school level in Bangladesh identified the mechanism of dowry and female hypergamy in the marriage market discourage parents from improving daughters education.

1.3 Motivation

We have discussed some thesis paper related to School dropout. All of the previous works [1, 3, 4, 5] mainly focuses on identifying factors associated with school dropout. Paper [5, 6] focuses on girl's school dropout. We want to make such analysis to identify factors behind lack of science students and their group change. We performed analysis such as correlation analysis and multiple linear regression. We also showed total percentage comparison of science students

and other discipline students.

1.4 Thesis Objective

This paper showed important factors behind lack of science students and their group change. We used statistical analysis such as correlation analysis and multiple regression analysis to identify factors associated with lack of science students and their group change. We identified how children family condition, their fear of science, lack of number of good institutions are responsible for students not taking science or changing group after taking science in Shariatpur. This thesis will be helpful to understand the actual reason why more students in Shariatpur are taking other disciplines.

1.5 Organization of the Thesis

In this section we discussed about the organization of the thesis.

- In chapter one, introduction presents an overview of the background of our work such as related work, motivation and our objective.
- In chapter two, literature review presents an overview of thesis literature, a clear concept for Importance of Science Education, and Conditions if any country has lack of science students.
- In chapter three, methodology and data represents available methods for identifying factors behind lack of science students and their group change and data analysis procedure.
- In chapter four, results and discussions represents the factors associated with lack of science and their group change. We represented the exact associated factors. Section by section we showed the analysis results. Firstly percentage of science students and other discipline students in different institution's, secondly identified reason behind less number of science students and reason behind science student's tendency for changing group. Finally, gave preventive idea for lack of science students and their group change.
- In chapter five, conclusion represents a clear discussion about all the workflow with results analysis. Then a short description about the future work availability. Finally a short conclusion presented as ending of our work.

1.6 Discussion

This is the introduction chapter and this chapter just introduces about our thesis, previous related work done by different authors and our goals. Also, it's showed the blueprint of our work.

Chapter 2

Literature Review

In this chapter we introduced our thesis literature, importance of science education, condition if any country lack of science students. In section 2.1 we discussed about literature introduction; in section 2.2 we discussed thesis literature; in section 2.3 we should summarize the chapter.

2.1 Introduction

A thesis is a statement in a non-fiction or a fiction work that a writer intends to support and prove. To understand our thesis work, literature review is important. Our thesis work named “Qualitative and Quantitative Analysis of Factor Identification for the Lack of Science Students and Group Changing Tendency at Shariatpur Region in Bangladesh”. We discussed importance of science education. Also, we discussed about statistics and field of statistics.

2.2 Thesis Literature

Our thesis named “Qualitative and Quantitative Analysis of Factor Identification for the Lack of Science Students and Group Changing Tendency at Shariatpur Region in Bangladesh” is a work of statistical analysis under the field of statistics. In this section, we discussed about statistics, field of statistics and importance of science education.

2.2.1 Statistics

Statistics are simply tools we use to describe, organize and interpret information data. We collect data, use descriptive statistics to describe it, and then inferential statistics to interpret it [7].

Statistics involves following steps:

- i. Identify the problem by asking question.
- ii. State your hypothesis
- iii. Identify the independent variable (IV).
- iv. Identify the dependent variable (DV).
- v. Choose the right statistical test.

2.2.2 Field of Statistics

The research areas or fields of Bioinformatics are many. These are follows [8]:

- i. Actuarial Science: discipline that applies mathematical and statistical methods to assess risk in the insurance and finance industries.
- ii. Astro statistics: discipline that applies statistical analysis to the understanding of astronomical data.
- iii. Biostatistics: A branch of biology that studies biological phenomena and observations by means of a statistical analysis.

- iv. Business Analytics: A rapidly developing business process that applies statistical methods to data sets to develop new insights and understanding of business performance.
- v. Geo Statistics: A branch of geography that deals with the analysis of data from discipline such as petroleum geology, hydrogeology etc.
- vi. Machine Learning: A subfield of computer science that formulates algorithms in order to make predictions from data.
- vii. Statistical Signal Processing: Utilizes the statistical properties of signals to perform signal processing tasks.

2.2.3 Importance of Science Education

Science is able to inform problem solving and decision making in many areas of life. Many of the major challenges and opportunities that confront our world need to be approached from a scientific perspective, taking into account social and ethical considerations.

By studying science, students:

- i. Developed understanding of the world, built on current scientific theories.
- ii. Learn that science involves particular processes and ways of developing and organizing knowledge and these continue to evolve.
- iii. Use their current scientific knowledge and skills for problem solving and developing further knowledge.
- iv. Use scientific knowledge and skills to make informed decisions about the communication, application and implications of science as these relate to their own lives and cultures and to sustainability of the environment.
- v. Overall to compete with the world and make world better.

2.3 Discussion

Science education is very important for a country. Lack of science students is very alarming condition for a country. About statistics and importance of science education are the main topic discussed in this chapter.

Chapter 3

Methodology and Data Analysis

In this chapter we introduced our thesis Methodology, Data Analysis description. In section 3.1 we discussed about thesis Methodology, and Data Analysis introduction; in section 3.2 we discussed about overview of Analytical approach; in section 3.3 we discussed about data analysis details; in section 3.4 we discussed about thesis Methodology Details; in section 3.5 we should give a short discussion of this chapter.

3.1 Introduction

We used some methodology on collected datasets to find the most significant factors associated with lack of science students and their group change, also we calculated percentage of science discipline students and other discipline students to view the differences between amount of science students and other discipline students. In this chapter we have a close look of Analytical Approach of this thesis and necessary information. In methodology section we have a close look on percentage calculation, correlation analysis and multiple linear regression analysis.

3.2 Overview of Analytical Approach

We used systematic and quantitative approach to identify the factors behind lack of science students and their group change. The graphical representation of approach shown in figure 3.1. In order to find out the factors which are responsible for lack of science students and group change and association of factors in lack of science students and their group change we use multiple linear regression and correlation analysis. These models are appropriate since we need to find the association and responsible factors which insists students to change group and lack of science students. In correlation analysis we cleaned outliers using box plots and we used Pearson correlation coefficients. In multiple linear regression analysis we used mahalanobis testing to check the outliers. We also find out percentage of science students in different institution.

3.3 Data Analysis

To identify the significant factors behind group change and lack of science students we used correlation analysis and multiple regression analysis. To calculate percentage we used percentage formula. Data used in this study are raw data, taken from students, their parents and their institutions teacher.

3.4 Methodology

In this section, we discussed about Pearson correlation coefficient analysis and multiple linear regression analysis and percentage calculation. We will give the analyze procedures of

Pearson correlation coefficient analysis and multiple linear regression analysis.

3.4.1 Analysis Methods

In this section, we should give the overview of analysis procedures of Pearson correlation coefficient analysis and multiple linear regression analysis and calculation of percentage.

3.4.1.1 Correlation Analysis.

Correlation Analysis is statistical method that is used to discover if there is a relationship between two variables/datasets and how strong that relationship maybe. In terms research this means that, correlation analysis is used to analyze quantitative data gathered from research methods such as surveys and polls to identify whether there is any significant connections, patterns or trends between the two [10]. There are two types of correlation analysis. In this thesis we used Pearson Product-Moment Coefficient to analyze fear of science, expensiveness of science, lack of quality teacher, lack of quality institution and family condition which is strong factor behind lack of science students. We also used this method to analyze to find out among education of father, education of mother, occupation of father, occupation of mother, number children and yearly income which is strongly

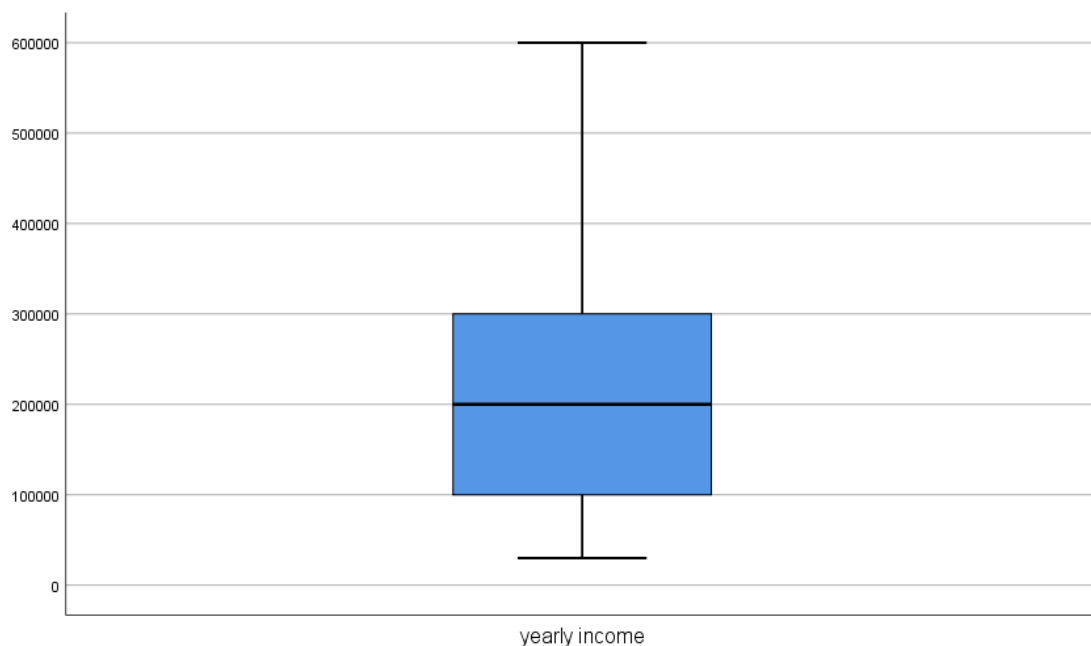


Figure 3.1: Boxplot

responsible factor. To avoid error we cleaned data using boxplots. Using boxplots we removed outliers

from our data.

Pearson correlation coefficient is the most widely used formula which measures the strength of the linear relationships between the data from both variables, rather than their ranks. This is a dimensionless coefficient, meaning that there are no data related boundaries to be considered when conducting analysis with this formula, which is a reason this is a first formula researchers try.

$$r = \frac{\sum(X-\bar{X})(Y-\bar{Y})}{\sqrt{\sum(X-\bar{X})^2} \sqrt{\sum(Y-\bar{Y})^2}}$$

Where, \bar{X} = mean of X variable
 \bar{Y} = mean of Y variable

After using this method we found our strongly responsible factor.

3.4.1.2 Multiple Linear Regression Analysis

Multiple linear regression is used to estimate the relationship between two or more independent variables and one dependent variable. We can use multiple linear regression when we want to know how strong the relationship is between two or more independent variables and one dependent variable, the value of the dependent variable at a certain value of the independent variables [12]. We have used multiple linear regression analysis to estimate the relationship between independent variables like fear of science, expensiveness of science, family condition and lack of quality teachers, lack of quality institutions and dependent variable lack of science. Also we used to identify the relationship between independent variables such as father education, mother education, father occupation, mother occupation, number children, yearly income and dependent variable group change. Preliminary analyses were conducted to ensure no violation of the assumptions of normality, linearity, multicollinearity, homoscedasticity.

For the analysis first boxplots indicated that each variable in the regression was normally distributed and free from outliers. Second, an inspection of the normal probability plot of standardized residuals as well as scatterplot standardized residuals against standardized predicted values indicated that the assumptions of normality, linearity and homoscedasticity of residuals were met.

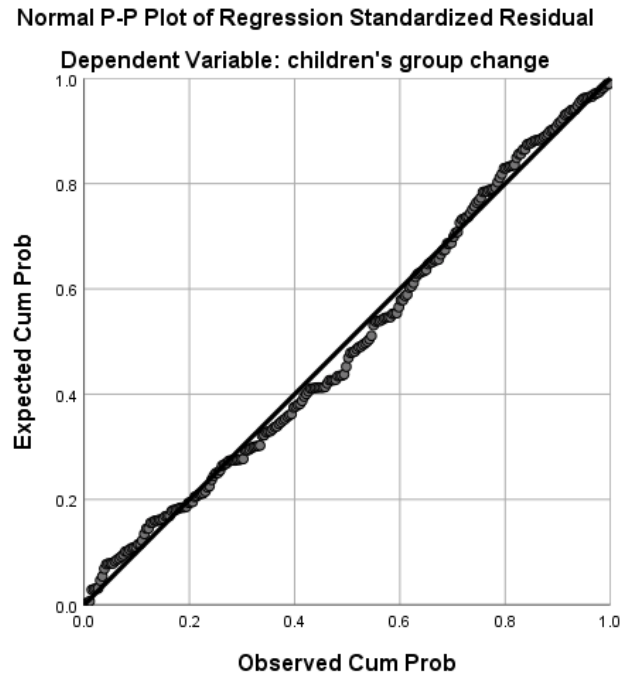


Figure 3.2: Normal Probability Plot

Normal probability plot showed that our datasets for children group change maintained linearity.

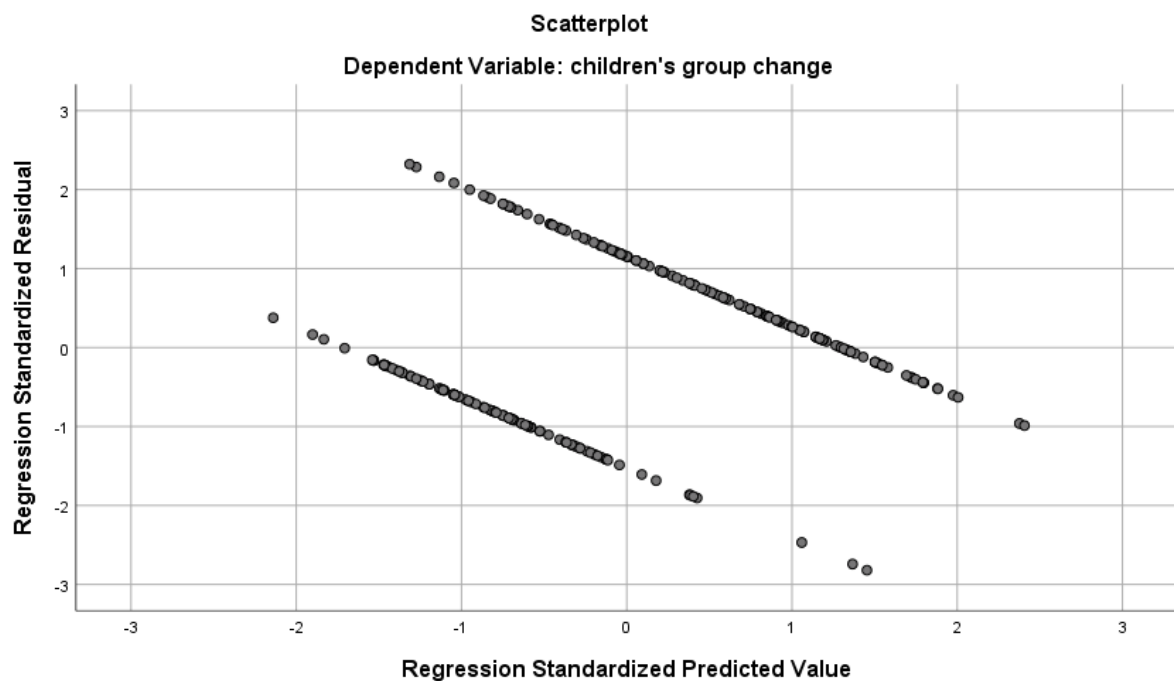


Figure 3.3: Scatterplot

Scatterplot indicates that our data set maintained normality and homoscedasticity. Third, Mahalanobis distance did exceed for $df = 5$ (lack of science) of 20.52 for 3 data and we removed that data. And also mahalanobis distance did exceed for $df = 6$ (group change) of 22.46 for 2 data and we removed those

data Fourth, relatively high tolerance for the predictors in the regression model indicated that multicollinearity would not interface with our ability to interpret the outcome of the regression model. Cook's distance is also less than 1.00 both for group change and lack of science model. So, there are no outliers for which model is not working properly. So, our model is working properly.

3.4.1.3 Percentage calculation

To find out percentage, we calculated percentage by dividing the value by the total value, and then multiplying the results by 100. The formula used to calculate percentage is:

$(\text{Value} / \text{total Value}) * 100\%$.

3.5 Discussion

This chapter showed a clear description about methodology we used for the various analysis of our thesis. Here also showed an overview of Analytical approach, Data information and details. Using datasets and methodology we got results of our thesis. Results and other details will be discussed in next chapter.

Chapter 4

Results and Discussions

The most important chapter, mainly focused on all analysis results and discussion. In section 4.1 we discussed about this chapter introduction; in section 4.2 we discussed about percentage calculation; in section 4.3 we discussed about Pearson's correlation analysis; in section 4.4 we discussed about multiple linear regression analysis; in section 4.5 we gave preventive idea to prevent lack of science; in section 4.6 we gave preventive idea to prevent students group change; in section 4.7 we gave a short discussion about this chapter.

4.1 Introduction

This chapter showed the results of finding responsible factors behind lack of science students and their group change and also percentage of science students in different institution. We analyzed raw datasets using correlation analysis and multiple regression analysis to find out among family conditions, expensiveness of science education, less number of quality teachers, less number of quality institutions, students fear of science which are strongly responsible for lack of science students. Also, we used correlation analysis and multiple linear regression analysis to identify among father education, mother education, mother occupation, father education, number of children in a family and yearly income which is strongly responsible for students group change after taking science. We showed strong relation between factors and lack of science students and their group change.

4.2 Percentage Calculation

To find out percentage we used percentage calculation formula and we got below results:

Percentage of student

Total	Science	Others	Sc. Ratio
1300	150	1150	11.53
500	10	490	2
1000	150	850	15
327	130	197	39.75
140	12	128	8.57
740	40	700	5.40
550	40	510	7.27
800	10	790	1.25
843	150	693	17.79
393	38	355	9.66
572	25	547	4.37
292	30	262	10.27
140	12	128	8.57
450	48	402	10.66
1140	120	1020	10.52
773	67	706	8.66

Table 4.1: Percentage of Science Students

From the table we can clearly say that in Shariatpur, there is lack of science students in comparison with other discipline students. Every institution has very less number of science students. There is huge difference in amount between science students and other discipline students.

4.3 Pearson's Correlation Analysis

Pearson's correlation analysis was used for identifying factors for both lack of science and reason behind group change after taking science. We discussed correlation analysis in this section.

4.3.1 Factors Behind Lack of Science Student

		Correlations					
		lack of science	lack of quality teacher	lack of quality institutions	science is expensive to study	students family condition	fear to study science
lack of science	Pearson Correlation	1	-.266**	-.642**	-.818**	-.739**	-.821**
	Sig. (2-tailed)		.000	.000	.000	.000	.000
	N	251	251	251	251	251	251
lack of quality teacher	Pearson Correlation	-.266**	1	.311**	.201**	.172**	.159*
	Sig. (2-tailed)	.000		.000	.001	.006	.012
	N	251	251	251	251	251	251
lack of quality institutions	Pearson Correlation	-.642**	.311**	1	.431**	.419**	.546**
	Sig. (2-tailed)	.000	.000		.000	.000	.000
	N	251	251	251	251	251	251
science is expensive to study	Pearson Correlation	-.818**	.201**	.431**	1	.763**	.655**
	Sig. (2-tailed)	.000	.001	.000		.000	.000
	N	251	251	251	251	251	251
students family condition	Pearson Correlation	-.739**	.172**	.419**	.763**	1	.632**
	Sig. (2-tailed)	.000	.006	.000	.000		.000
	N	251	251	251	251	251	251
fear to study science	Pearson Correlation	-.821**	.159*	.546**	.655**	.632**	1
	Sig. (2-tailed)	.000	.012	.000	.000	.000	
	N	251	251	251	251	251	251

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

Table 4.2: Correlation for lack of science

From table 4.2 we observe that factors such as lack of quality teacher, lack of quality institutions, science is expensive to study, students family income and fear to study science has significant relation with lack of science students. If we look at the table we can see that lack of science and fear to study has correlation coefficient -.821 which is more than 0.7 which means they are strongly correlated and fear to study science has great impact on lack of science. Then

we can see that science is expensive to study and lack of science has correlation coefficient $-.818$ which is also above 0.7 that means it is strongly correlated to lack of science and expensive of science has great impact behind lack of science. Then student's family condition and lack of science has correlation coefficient $-.739$ which is also more than 0.7 that means it is also strongly responsible for lack of science. Then we can see that student's family condition and lack of science has correlation coefficient $-.642$ which is above 0.3 and less than 0.7 which means their relation is moderate. So, student's family condition has moderate impact on lack of science. Lack of quality teacher is not moderately impactful but has little impact on lack of science because it has correlation coefficient $-.266$. So, we can say that fear of study science has more impact than any other factors on lack of science students.

4.3.2 Factors Influences Science Students to Change Group

We have factors for group change such as father education, mother education, father occupation, mother occupation, children number of a family and yearly income. We investigated most significant factor using correlation analysis. From table 4.3 we can observe that there is relationship between factors and students group change. Factor yearly income has correlation coefficient $.571$ which is more than 0.3 , so it is moderately related to students group change that means yearly income has great impact behind students group change. Father education and students group change correlation coefficient is $.445 > 0.3$. They are also moderately related with each other that means father education has moderate impact on students group change. Then mother education and children group change has correlation coefficient $.364 > .3$. they are moderately correlated which means mother education also has impact on students group change. Children number in a family and students group change has correlation coefficient $-.415 > .3$ they are also moderately correlated. So, we can say that children number in a family has also moderate impact on students group change. Father occupation and mother occupation has very less impact on students group change having coefficient $.100$ and $.063$ respectively. So, finally we observe that yearly income of a family is most significant factor in students group change. If yearly income of a family is less than possibility of group change will rise and if yearly income increases then possibility of students group change will decrease. After yearly income father education is also a most significant

factor in students group change. In a family if father is uneducated than possibility of students group change is most.

		Correlations						
		father's occupation	father's education	mother's occupation	mother's education	children number	children's group change	yearly income
father's occupation	Pearson Correlation	1	.008	.016	.155*	-.209**	.100	.154*
	Sig. (2-tailed)		.905	.803	.014	.001	.113	.015
	N	251	251	251	251	251	251	251
father's education	Pearson Correlation	.008	1	.151*	.624**	-.218**	.445**	.343**
	Sig. (2-tailed)	.905		.017	.000	.000	.000	.000
	N	251	251	251	251	251	251	251
mother's occupation	Pearson Correlation	.016	.151*	1	.311**	-.191**	.063	.119
	Sig. (2-tailed)	.803	.017		.000	.002	.322	.060
	N	251	251	251	251	251	251	251
mother's education	Pearson Correlation	.155*	.624**	.311**	1	-.280**	.364**	.384**
	Sig. (2-tailed)	.014	.000	.000		.000	.000	.000
	N	251	251	251	251	251	251	251
children number	Pearson Correlation	-.209**	-.218**	-.191**	-.280**	1	-.415**	-.308**
	Sig. (2-tailed)	.001	.000	.002	.000		.000	.000
	N	251	251	251	251	251	251	251
children's group change	Pearson Correlation	.100	.445**	.063	.364**	-.415**	1	.571**
	Sig. (2-tailed)	.113	.000	.322	.000	.000		.000
	N	251	251	251	251	251	251	251
yearly income	Pearson Correlation	.154*	.343**	.119	.384**	-.308**	.571**	1
	Sig. (2-tailed)	.015	.000	.060	.000	.000	.000	
	N	251	251	251	251	251	251	251

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

Table 4.3: Correlation analysis for group change

Also number of children in a family has impact on students group change. If family has many children then they cannot afford their educational expenses.

4.4 Multiple Regression Analysis

We also used multiple regression analysis to identify most significant factor behind lack of science and students group change. We discussed multiple regression analysis results here.

4.4.1 Factors behind lack of science students

In this section we would show how factors are responsible in lack of science. Here lack of science is independent variable and students family condition, fear to study science, lack of quality teacher, lack of quality institution, expensiveness of science are independent variable.

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B		Correlations		
		B	Std. Error	Beta			Lower Bound	Upper Bound	Zero-order	Partial	Part
1	(Constant)	6.727	.208		32.275	.000	6.316	7.137			
	lack of quality teacher	-.015	.009	-.044	-1.687	.093	-.034	.003	-.266	-.107	-.041
	lack of quality institutions	-.072	.010	-.210	-6.863	.000	-.093	-.051	-.642	-.402	-.168
	science is expensive to study	-.125	.013	-.388	-9.585	.000	-.151	-.100	-.818	-.522	-.235
	students family condition	-.036	.013	-.111	-2.817	.005	-.062	-.011	-.739	-.177	-.069
	fear to study science	-.118	.011	-.375	-10.343	.000	-.141	-.096	-.821	-.551	-.253

Table 4.4: Multiple Regression Analysis for lack of science

From table 4.4 we found that science is expensive to study and fear of science is most significant factor. It has higher beta value beta= -.388 which means if we decrease expensiveness then number of science students will increase by .388 standard deviation unit. Then we found that fear to study has higher beta value beta= -.375 which means if we can decrease students fear of science then number of science students will increase by .375 standard deviation unit. Then lack of quality institutions has beta value beta=-.210 which means if quality institutions increase then lack of science will decrease. Student's family condition has also significant value -.111. Our model showed that lack of quality teacher is not significant because it has significant value more than 0.05. But after this analysis we got that fear to study science, science is expensive to study is more responsible in lack of science. Then lack of quality institutions is responsible. And also student's family condition has little impact.

4.4.2 Factors influences science students to change group

In this section, we would show how factors are responsible in students group change. Our factors are father education, mother education, father occupation, mother occupation, children's number in family and yearly income are independent variable. And student's group change is dependent variable.

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B		Correlations	
		B	Std. Error	Beta			Lower Bound	Upper Bound	Zero-order	Partial
1	(Constant)	1.537	.156		9.833	.000	1.229	1.845		
	father's occupation	-.006	.018	-.016	-.321	.749	-.042	.030	.100	-.021
	father's education	.028	.007	.258	4.133	.000	.015	.042	.445	.256
	mother's occupation	-.126	.090	-.071	-1.403	.162	-.303	.051	.063	-.090
	mother's education	.000	.008	-.003	-.048	.961	-.017	.016	.364	-.003
	children number	-.112	.024	-.243	-4.654	.000	-.159	-.064	-.411	-.286
	yearly income	1.250E-6	.000	.421	7.860	.000	.000	.000	.571	.450

Table 4.5: Multiple Regression Analysis for students group change

From table 4.5 we found that yearly income is most significant factor in students group change. It has higher beta value than other factors. Beta = .421 which means if we decrease yearly income staying in science group also will decrease by .421 standard deviation unit. Then we can see that father's education also has an impact on students group change. It has beta value= .258 which means if education of father decrease then staying in science also will decrease. Then children number has beta value= -.243 which means if number of children increase then staying in science will decrease. Our model showed that in group change mother education, mother's occupation, and father's occupation isn't significant because their significant value is more than 0.05. So after multiple regression analysis we can say that yearly income of family, father's education and children number of a family has great impact on students group change.

4.5 Prevention for Lack of Science Students

We have collected opinion from students, their parents and from their teachers. We did a qualitative analysis on their opinion. From students opinion, we have found out 90% students who didn't take science have given their opinion that they have fear of science. Also 71% students have given their opinion that they have come from a very poor family that's why they couldn't afford science education cost. Also 65% students admit that in Shariatpur there is very less number of quality institution. 56% students admit that in Shariatpur there is very less number of quality teacher who can motivate students who can remove fear from students.

Form parent's opinion we have found out 87% parents admit that reason behind their child not taking science is science is expensive to study. Many of the family had on average more than 3 children so they couldn't afford expenses of their child students. Also 43% parents admit that there is less number of quality institutions. From teacher opinion we have found out that 70% teachers admit that behind lack of science financial problem is responsible. 82% teacher admits

that students have fear of science. Students think it is difficult to get good results in science. Also 53% teacher admits that less number of quality institution and lack of quality teacher also plays an important factor behind lack of science.

From students, parents and their teachers opinion it is clearly said that if costliness of science can be reduced then lack of science can be prevented. Also students have fear science so teachers and family have to motivate students to take science also if campaign can be organized then surely students will be motivated. They will have believe to take science and can do much better. Also quality institution and quality teacher have to be increased in order to prevent lack of science students.

4.6 Prevention for Students Group Change

We have also collected opinion for finding out reason behind students group change after taking science. We collected data from students who have already changed group also who wants to change group in future, from their parents also from their teachers. We have found out that 94% students change their group because of fear and facing difficulties in studying in science. 92% students admitted that science education is costly and they are not capable of bearing science education expenses. 43% students admit that there is lack of quality institution and 36% students admit that there is lack of quality teacher. From parents opinion we found out that 95% parents gave their opinion on expensiveness of science education. And 73% parents talked about their children's fear of science. 67% parents talked about lack of quality institution and 65% parents talked about lack of quality teacher.

From teachers opinion we have found out that students fear of science and expensiveness of science is responsible for students group change because 80% teacher admit that student's fear of science responsible and 83% teacher admit that expensiveness of science is responsible. If cost of science education can be reduced because of most of the students in Shariatpur have financial problem. Then, student's group change can be prevented. Campaign should be organized in institution to motivate students and to remove their fear about science. Quality institution should be increased and more quality teacher should be appointed. If these problems can be maintained properly then students won't change their group and in Shariatpur number of science students will be increased

4.7 Discussion

In this study, we have analyzed raw data collected from different institutions students, their parents, their teachers. We identified most significant factors behind lack of science and their group change. We used correlation analysis and multiple regression analysis. Our findings showed that students fear of science, expensiveness of science, students family condition, lack of quality institutions and lack of quality teachers have impact on lack of science students. Also father education, mother education, yearly income, father occupation, children number has impact on children's group change after taking science.

Chapter 5

Conclusions

We should summarize the problem in this chapter. In section 5.1 we would give a clear discussion about our thesis and results. In section 5.2 we discussed about future work opportunities. In section 5.3 we should conclude the whole work in a summery.

5.1 Discussion

We investigated the factors behind lack of science students and their group change after taking science. We collected data from different institutions students, their parents and their teachers. Then we found three category students that are, who already changed group, students who wants to change group in future and students who doesn't want to change group. Then we cleaned our data using boxplot and mahalanobis distance. Then we used correlation analysis and multiple regression analysis. Based on correlation analysis and multiple regression analysis we found that factors fear of studying science, cost of science are strongly responsible for lack of science students. Lack of quality institutions, lack of quality teachers, and student's family conditions are also responsible for lack of science students. We also found reason behind student's tendency to group change. Factors yearly income, father education and children number in a family is strongly responsible for lack of science students. Mother education, father occupation and mother education also has little impact on students group change after taking science.

5.2 Future Work

Our study named "Qualitative and Quantitative Analysis of Factor Identification for the Lack of Science Students and Group Changing Tendency at Shariatpur Region in Bangladesh" would be useful for increasing number science students also for protecting students form changing group after taking science in Shariatpur. This kind of approach would be very useful for finding factors behind science student's dropout from institutions.

We have shown few responsible factors behind lack of science and group change. There will be an opportunity to show other factors significance behind lack of science students and their group change. We showed some strongly responsible factors behind lack of science students and their group change after taking science using correlation analysis and multiple regression analysis. Now, new datasets and new factors can be shown using these methods.

5.3 Conclusions

In this study, we have used raw datasets of teachers, students and their guardians. We used correlation analysis and multiple regression analysis. We have found out factors like fear of science, expensiveness of science and lack of quality institutions, lack of quality teacher and students family condition has association with lack of science students and behind students group change factors like father education, mother education, father occupation, yearly income of family and number of children of a family has association with children's group change after taking science. This study will be helpful for finding out factors behind science student's dropout. This study will also be useful for making people aware of the effects of lack of science students in a district as well as in a country. If cost of studying science can be reduced because most of the people in Shariatpur are either related to agriculture or auto driving and student's fear of science can be reduced then science students will increase and also rate of changing science can be reduced if we can aware parents about lack of science and impact of studying science. Also number quality institutions should be increased and also quality teacher.

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