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CHAPTER VI

SUMMARY OF THE STUDY, CONCLUSIONS AND SUGGESTIONS

In every research, the investigator aims to reach at sound conclusions and valid generalizations based on the analysis and interpretation of data collected. This chapter presents an overview of the study, the major findings, tenability of hypothesis, conclusions, suggestions of the study and suggestions for further research.

6.1 AN OVERVIEW OF THE STUDY

The present study is designed to find out the influence of emotional intelligence, locus of control and rigidity on mathematics achievement of students at degree level.

6.1.1 Statement of the Problem

The present study is entitled as “INFLUENCE OF EMOTIONAL INTELLIGENCE, LOCUS OF CONTROL AND RIGIDITY ON MATHEMATICS ACHIEVEMENT OF STUDENTS AT DEGREE LEVEL.”

6.1.2 Hypothesis of the Study

Each of the independent variables selected for study will have a significant influence on the dependent variable, and this influence will be visible in different forms like the following:
(a) significant correlation between each independent variable with the dependent variable; and
(b) in the form of significant mean differences in the scores of the dependent variable for any two contrasted groups developed on the basis of the scores in each of the independent variables (low, average and high groups developed for each independent variable).

6.1.3 Objectives of the Study

I. To assess the relation between each of the independent variables and mathematics achievement for the general sample and sub samples.
   a) To assess the relation between emotional intelligence and mathematics achievement for the general sample and sub samples.
   b) To assess the relation between locus of control and mathematics achievement for the general sample and sub samples.
   c) To assess the relation between rigidity and mathematics achievement for the general sample and sub samples.

II. To compare the mean mathematics achievement scores of three groups (low, average and high) based on the independent variables for the general sample and sub samples.
   a) To compare the mean mathematics achievement scores of three groups based on emotional intelligence (low, average and high) for the general sample and sub samples.
b) To compare the mean mathematics achievement scores of three groups based on locus of control (low, average and high) for the general sample and sub samples.

c) To compare the mean mathematics achievement scores of three groups based on rigidity (low, average and high) for the general sample and sub samples.

III. To test whether the correlations obtained between each of the independent variables and mathematics achievement for the sub samples differ significantly.

IV. To assess the combined effect of the three independent variables (emotional intelligence, locus of control and rigidity) on the dependent variable (mathematics achievement) using partial and multiple correlation.

V. To assess the influence of the three independent variables on mathematics achievement using multiple regression analysis.

6.1.4 Variables of the Study

For the present study, mathematics achievement is taken as the dependent variable. The three selected variables such as emotional intelligence, locus of control and rigidity are taken as independent variables in this study.

6.1.5 Methodology of the Study in Brief

Normative survey method is used for the present study. The tools used for the collection of data are:

1) Mathematics Achievement Test

2) Emotional Intelligence Scale
3) Locus of Control Scale

4) Rigidity Scale

For the selection of sample, stratified random sampling technique was adopted. Eight hundred second year degree students in mathematics drawn from twenty-six colleges in Ernakulam, Idukki, Kottayam, Pathanamthitta and Alappuzha districts were used as the sample for the study. In the selection of sample, due representation was given to sex of the subjects, urban-rural locale of the institutions of the subjects and type of management of college. All the different tools were administered to the selected sample and the data were collected and analyzed using appropriate statistical methods. The major statistical methods used were Pearson’s Product Moment Coefficient of Correlation, ANOVA, Scheffe’s Method, the two-tailed test of significance of difference between means, the test of significance of difference between two correlation coefficients, Partial Correlation, Multiple Correlation and Multiple Regression Analysis.

6.2 MAJOR FINDINGS OF THE STUDY

The major findings emerged from the study are given under appropriate heads as below:
• RELATION BETWEEN EACH OF THE INDEPENDENT VARIABLES
AND MATHEMATICS ACHIEVEMENT

a) Relation between emotional intelligence and mathematics
achievement – based on Pearson’s Product-Moment Coefficient of
Correlation

1) There is positive and very high relation between emotional intelligence and
mathematics achievement for the general sample and sub samples based on sex,
location of institution and type of management of college. These relationships
are summarized as follows.

- For general sample ($r = 0.90$), .99 confidence interval of $r$ – between 0.879
  and 0.914
- For males ($r = 0.89$), .99 confidence interval of $r$ – between 0.854 and
  0.924
- For females ($r = 0.90$), .99 confidence interval of $r$ – between 0.883 and
  0.923
- For urban college students ($r = 0.91$), .99 confidence interval of $r$ – between
  0.885 and 0.926
- For rural college students ($r = 0.89$), .99 confidence interval of $r$ – between
  0.858 and 0.920
- For government college students ($r = 0.91$), .99 confidence interval of $r$ – between
  0.860 and 0.956
- For private college students ($r = 0.90$), .99 confidence interval of $r$ – between
  0.877 and 0.915
b) Relation between locus of control and mathematics achievement – based on Pearson’s Product-Moment Coefficient of Correlation

2) There is positive and high relation between locus of control (internality score) and mathematics achievement for the general sample and sub samples based on sex, location of institution and type of management of college. These relationships are summarized as follows:

- For general sample \( (r = 0.84) \), .99 confidence interval of \( r \) – between 0.816 and 0.869
- For males \( (r = 0.82) \), .99 confidence interval of \( r \) – between 0.766 and 0.875
- For females \( (r = 0.90) \), .99 confidence interval of \( r \) – between 0.877 and 0.920
- For urban college students \( (r = 0.87) \), .99 confidence interval of \( r \) – between 0.842 and 0.898.
- For rural college students \( (r = 0.82) \), .99 confidence interval of \( r \) – between 0.767 and 0.866.
- For government college students \( (r = 0.78) \), .99 confidence interval or \( r \) – between 0.668 and 0.885.
- For private college students \( (r = 0.87) \), .99 confidence interval of \( r \) between – 0.842 and 0.890.
c) **Relation between rigidity and mathematics achievement - based on Pearson’s Product-Moment Coefficient of Correlation**

3) There is negative and high relation between rigidity and mathematics achievement for the general sample and sub samples based on sex, location of institution and type of management of college. These relationships are summarized as follows:

- For general sample \((r = -0.71)\), .99 confidence interval of \(r\) – between - 0.756 and - 0.666.
- For males \((r = -0.76)\), .99 confidence interval of \(r\) – between - 0.827 and - 0.685.
- For females \((r = -0.79)\), .99 confidence intervals of \(r\) – between - 0.833 and - 0.752.
- For urban college students \((r = -0.79)\), .99 confidence intervals of \(r\) – between - 0.833 and - 0.747.
- For rural college students \((r = -0.69)\), .99 confidence interval of \(r\) – between - 0.771 and - 0.618.
- For government college students \((r = -0.70)\), .99 confidence interval of \(r\) – between - 0.842 and - 0.566.
- For private college students \((r = -0.75)\). .99 confidence interval of \(r\) – between - 0.788 and - 0.702.
SUMMARY OF THE STUDY, CONCLUSIONS AND SUGGESTIONS

- SIGNIFICANCE OF DIFFERENCE IN THE MEAN SCORES OF MATHEMATICS ACHIEVEMENT OF THREE GROUPS (LOW, AVERAGE AND HIGH) BASED ON THE INDEPENDENT VARIABLES

4) Mathematics achievement of low, average and high groups in emotional intelligence is significantly different. The mean scores of mathematics achievement of low group (16.93), average group (23.56) and high group (28.79) show variation. Analysis of variance (ANOVA) was applied for studying the variation in the mean scores of mathematics achievement of low, average and high groups in emotional intelligence. The F value (1023.7) reveals that these variations are significant at .01 level.

5) The Scheffe’s multiple comparisons method used to compare the mean scores of mathematics achievement of any two contrasted groups taken at a time (pair-wise), show significance at .01 level. Hence mathematics achievement of each of these groups compared is significantly different. Mathematics achievement is significantly high among students having average emotional intelligence than students having low emotional intelligence. Mathematics achievement of students having high emotional intelligence is significantly high when comparing with the mathematics achievement of students having average and low emotional intelligence.
6) When mean scores of mathematics achievement in the case of LEIG were compared, the sub sample based on sex showed significant difference (t = 5.121, p<.01). The mean scores for mathematics achievement test of females were found to be higher than males. The sub samples based on location of institution did not show any significant difference (t =1.076, p>.05). The same is the condition for the sub sample based on type of management of college (t = 1.054, p>.05).

- When mean scores of mathematics achievement in the case of AEIG were compared, the sub sample based on sex showed significant difference (t = 10.449 p<.01) and females were found to be higher scorers. The sub sample based on type of management of college showed significant difference (t = 2.033, p<.05) and the private college students were the higher scorers. While sub sample based on location of institution did not show any significant difference.

- In the case of HEIG, significant difference in the mean scores of mathematics achievement were found for sub sample based on sex (t = 5.019, p<.01) and females were the higher scorers, while sub samples based on location of institution did not show any significant difference (t = 0.236, p>.05). The same is the condition of the sub sample based on the type of management of college (t = 1.946, p>.05).
b) **Significance of difference in the mean scores of mathematics achievement of three groups (low, average and high) based on locus of control**

7) Mathematics achievement of low, average and high groups in locus of control is significantly different. The mean scores of mathematics achievement of low group (17.99), average group (24.38) and high group (28.48) show variation. Analysis of variance (ANOVA) was applied for studying the variation in the mean scores of mathematics achievement of low, average and high groups in locus of control. The F value (524.953) reveals that these variations are significant at .01 level.

8) The Scheffe’s multiple comparisons method used to compare the mean scores of mathematics achievement of any two contrasted groups taken at a time (pair-wise), show significance at .01 level. Hence mathematics achievement of each of these groups compared is significantly different. Mathematics achievement is significantly high among students having average locus of control than students having low locus of control (externals). Mathematics achievement of students having high locus of control (internals) is significantly high when comparing with the mathematics achievement of students having average and low locus of control.

9) • When mean scores of mathematics achievement in the case of LLCG were compared, the sub samples based on sex, location of institution and type of management of college showed significant difference. That is, mean scores for
mathematics achievement showed difference between males and females 
(t = 6.734, p<.01) and females were found to be high scorers. Similarly, the 
mean mathematics achievement scores showed difference between urban 
college and rural college students (t =2.754, p< .01) and urban college 
students were the higher scorers. The mean scores for mathematics 
achievement test also showed difference between government college and 
private college students (t =2.245, p<.05).

- In the case of ALCG, significant differences in the mean scores of mathematics 
achievement were found for sub sample based on sex (t = 9.84, p<.01). 
Similarly, mean scores of mathematics achievement for the sub sample based on 
location of institution showed significant difference (t = 6.758, p<.01). The 
same is the condition of the sub sample based on type of management of college 
(t = 4.709, p<.01).

- When mean scores of mathematics achievement in the case of HLCG were 
compared, the sub sample based on sex showed significant difference 
(t = 11.094, p<.01). The same is the condition of the sub samples based on 
location of institution (t = 2.763, p<.01) and type of management of college 
(t = 6.158, p<.01).

c) **Significance of difference in the mean scores of mathematics achievement 
of three groups (low, average and high) based on rigidity**

10) Mathematics achievement of low, average and high groups in rigidity 
is significantly different. The mean scores of mathematics achievement of low
group (28.04), average group (24.02) and high group (18.20) show variation. Analysis of variance (ANOVA) was applied for studying the variation in the mean scores of mathematics achievement of low, average and high groups in rigidity. The F value (307.772) reveals that these variations are significant at .01 level.

11) The results of Scheffe’s method showed significant difference in the mean scores of mathematics achievement between low and average scorers in rigidity, low and high scorers in rigidity and between average and high scorers in rigidity. Mathematics achievement is significantly higher among students having low rigidity than students having average rigidity. Mathematics achievement of students having high rigidity is significantly low when compared to the mathematics achievement of students having average and low rigidity.

12) • When mean scores of mathematics achievement in the case of LRG were compared, the sub sample based on sex showed significant difference (t =10.462, p<.01). Similarly, sub samples based on location of institution (t = 4.41, p<.01) and type of management of college (t = 4.83, p<.01) also showed significant difference.

• In the case of ARG, significant differences in the mean scores of mathematics achievement were found for sub sample based on sex (t = 8.993, p<.01). Similarly, the mean scores of mathematics achievement for the sub sample
based on location of institution showed significant difference (t = 8.292, p<.01). The same is the condition of the sub sample based on type of management of college (t = 6.44, p<.01).

- When mean scores of mathematics achievement in the case of HRG were compared, the sub sample based on sex showed significant difference (t = 8.587, P<.01), while sub sample based on location of institution did not show any significant difference (t = 1.394, p>.05). The same is the case of the sub sample based on type of management of college (t = 1.133, p>.05).

- **COMPARISON OF CORRELATIONS**

  a) **Significance of difference in the relation between emotional intelligence and mathematics achievement for sub samples – based on the test of significance of difference between two r’s**

  13) There is no significant difference in the relation of emotional intelligence and mathematics achievement between males and females (CR = 0.918, p>.05), between urban and rural college students (CR= 1.16, p>.05), and between government and private college students (CR = 0.582, p>.05). These critical ratios are not showing significance even at .05 level.
b) Significance of difference in the relation between locus of control and mathematics achievement for sub samples – based on the test of significance of difference between two r’s

14) There is significant difference in the relation of locus of control (internality score) and mathematics achievement between males and females (CR = 3.93, p<.01), between urban and rural college students (CR = 2.546, p<.05), and between government and private college students (CR = 2.439, p<.05).

c) Significance of difference in the relation between rigidity and mathematics achievement for sub samples – based on the test of significance of difference between two r’s

15) There is no significant difference in the relation of rigidity and mathematics achievement between males and females (CR = 1.18, p>.05), and between government and private college students (CR = 0.75, p>.05). The critical ratio obtained between urban and rural college students (CR = 2.93, p<.01) is significant at .01 level.

• THE COMBINED EFFECT OF THE THREE INDEPENDENT VARIABLES ON THE DEPENDENT VARIABLE (MATHEMATICS ACHIEVEMENT) – BASED ON PARTIAL CORRELATION AND MULTIPLE CORRELATION

a) The relation between emotional intelligence and mathematics achievement – based on Partial Correlation

16) There is positive and significant relation between emotional intelligence and mathematics achievement, when the effects of locus of control and rigidity are
partialled out using partial correlation technique for the general sample and sub samples based on sex, location of institution and type of management of college. The partial correlation coefficients thus obtained ($r_{12.34}$) show significance at .01 level, for the general sample and sub samples. The $r_{12.34}$ values for general sample ($r = 0.64$), for males ($r = 0.62$), for females ($r = 0.58$), for urban college students ($r = 0.62$), for rural college students ($r = 0.63$), for government college students ($r = 0.75$) and for private college students ($r = 0.59$) are all positive also. In all these cases, the values of partial correlation coefficients are lower than the respective values of Pearson’s Product Moment Coefficient of Correlation ‘r’ between emotional intelligence and mathematics achievement for the general sample and different sub samples based on sex, location of institution and type of management of college.

b) The relation between locus of control and mathematics achievement – based on Partial Correlation

There is positive and significant relation between locus of control (internality score) and mathematics achievement, when the effects of emotional intelligence and rigidity are partialled out using partial correlation technique for the general sample and sub samples – females, urban college and private college students. The relation between the two variables is not significant even at .05 level for the sub samples – males, rural college and government college students. The partial correlation coefficients thus obtained ($r_{13.24}$) show significance at .01 level, for
the general sample and sub samples–females, urban college and private college students. The $r_{13.24}$ values for general sample ($r = 0.29$), for males ($r = 0.11$), for females ($r = 0.47$), for urban college students ($r = 0.38$), for rural college students ($r = 0.04$), for government college students ($r = 0.15$) and private college students ($r = 0.36$) are all positive. In all these cases, the values of partial correlation coefficients are lower than the respective value of Pearson’s Product Moment Coefficient of Correlation ‘r’ between internal locus of control and mathematics achievement for the general sample and different sub samples based on sex, location of institution and type of management of college.

c) The relation between rigidity and mathematics achievement – based on Partial Correlation

18) There is negative and significant relation between rigidity and mathematics achievement, when the effect of emotional intelligence and locus of control are partialled out using partial correlation technique for the sub samples – females and rural college students. The relation between the two variables is not significant for the general sample and sub samples – males, urban college students, government college and private college students even at .05 level. The $r_{14.23}$ value for general sample ($r = 0.02$) is found to be positive, while $r_{14.23}$ values for males ($r = -0.06$), for females ($r = -0.16$), for urban college students ($r = -0.04$), for rural college students ($r = -0.12$), for government college students ($r = -0.07$), and for private college students ($r = -0.02$) are all negative.
d) **The relation between mathematics achievement and combined effect of the three independent variables – based on Multiple Correlation**

19) There is significant relation between mathematics achievement and combined effect of the three independent variables such as emotional intelligence, locus of control and rigidity. The coefficient of multiple correlation ‘R’ is used to assess the combined effect of the three independent variables on the dependent variable - mathematics achievement. The ‘R’ values obtained for the general sample (R = 0.674), for males (R = 0.632), for females (R = 0.703), for urban college students (R = 0.690), for rural college students (R = 0.635), for government college students (R = 0.761) and for private college students (R = 0.663) show significance at .01 level.

- **INFLUENCE OF THE THREE INDEPENDENT VARIABLES ON MATHEMATICS ACHIEVEMENT**

a) **Influence of the three independent variables on mathematics achievement – based on Multiple Regression Analysis**

20) The multiple regression analysis is applied to assess the influence of the three independent variables such as emotional intelligence, locus of control and rigidity on the dependent variable – mathematics achievement. It is found that 82.8% ($R^2 = 0.828$) variation in the score of mathematics achievement is explained by these three independent variables. Of this 58.77% variation in the score of mathematics achievement is explained by the independent variable - emotional intelligence. Thus the emotional intelligence is the highest
influencing independent variable on the score of mathematics achievement of students. Similarly, another independent variable selected - locus of control (internality score) - explains 25.28% variation in the mathematics achievement score and hence forms the second highest influencing independent variable, while rigidity (1.21%) explains only negligible variation in the score of mathematics achievement. The result shows that for every unit change in the score of emotional intelligence, there will be 0.16 unit increase in the score of mathematics achievement test. Also for every unit change in the score of internal locus of control, there will be 0.08 unit increase in the score of mathematics achievement test. In the case of rigidity, there is only negligible unit change in the score of mathematics achievement test.

The multiple regression equation obtained is as follows:

\[
\text{Mathematics Achievement score (MA)} = -17.26 + 0.16 x_1 + 0.08 x_2 + 0.01 x_3
\]

where,

\[x_1 = \text{Score of Emotional Intelligence Scale}\]

\[x_2 = \text{Score of Locus of Control Scale}\]

\[x_3 = \text{Score of Rigidity Scale}\]

b) Influence of background variables on mathematics achievement – based on Multiple Regression Analysis

21) Sex and management of college have significant influence on mathematics achievement scores of the students. But the background variable, location of institution does not have any significant influence on mathematics achievement
score of the students (significance level greater than .05). When the multiple regression analysis is applied to assess the influence of background variables like sex, location of institution and type of management of college on mathematics achievement scores of students, it is found that 12.7 per cent ($R^2 = 0.127$) of the variation in the mathematics achievement score is explained by these variables. The result shows that males have 4.45 units less score than females in mathematics achievement. Also urban college students have 0.74 unit less score than their rural counterparts in mathematics achievement test. The government college students have 1.34 units lesser score than the private college students. Thus the multiple regression equation obtained can be written as follows:

Mathematics Achievement score (MA) = 25.62 - 4.45 $x_1$ - 0.74 $x_2$ -1.34 $x_3$

where,

$x_1$ = dummy for males

$x_2$ = dummy for urban college students

$x_3$ = dummy for government college students

c) Influence of the independent variables and background variables on mathematics achievement – based on Multiple Regression Analysis

22) The independent variables such as emotional intelligence, locus of control and rigidity together with the background variables such as sex, location of institution and type of management of college have significant influence (significance at 0.000 level) on mathematics achievement. Multiple regression analysis is applied to assess the influence of the three independent variables,
together with background variables such as sex, location of institution and type
of management of college on mathematics achievement, which show that 87.6
per cent ($R^2 = 0.876$) of the variation in the mathematics achievement scores
is explained by these variables. For every unit change in the score of emotional
intelligence, there will be 0.11 unit increase in the score of mathematics
achievement. For every unit change in the score of internal locus of control,
there will be 0.08 unit increase in the score of mathematics achievement test.
There will be 0.10 unit decrease in the score of mathematics achievement for
every unit change in the score of rigidity. It can also be inferred from the result
that the males have 2.90 units lesser score in mathematics achievement than
females and urban college students have 1.11 units more score in mathematics
achievement than the rural college students. It is also clear from the result that
the government college students have 1.41 units less score than their private
college counterparts. The multiple regression equation can be written as
follows:

Mathematics Achievement score (MA) = 2.44 + 0.11 x₁ + 0.08 x₂ - 0.10 x₃
- 2.90 x₄ + 1.11 x₅ - 1.41 x₆

where,

$x₁ = \text{score of Emotional Intelligence Scale}$

$x₂ = \text{score of Locus of Control Scale}$

$x₃ = \text{score of Rigidity Scale}$

$x₄ = \text{dummy for males}$
\[ x_5 = \text{dummy for urban college students} \]
\[ x_6 = \text{dummy for government college students} \]

d) **Interaction with other independent variables – based on Multiple Classification Analysis**

23) The background variable – sex of the sample does not have any significant interaction with other independent variables in the study. The Multiple Classification Analysis gives the unadjusted and adjusted means of mathematics achievement score corresponding to different groups of independent variable with corresponding \( R^2 \). The unadjusted mean of mathematics achievement score of males (20.50) and adjusted mean of mathematics achievement score of males (21.46) are almost same. Similarly, unadjusted mean of mathematics achievement score of females (25.04) and adjusted mean of mathematics achievement score of females (24.63) are also almost the same.

24) The background variable – location of institution does not have any significant interaction with other independent variables in the study. The multiple classification analysis table gives unadjusted mean of mathematics achievement score of urban college students as 23.54 and adjusted mean of mathematics achievement score of urban college students as 24.06. Both these values are nearly the same. Also unadjusted mean of mathematics achievement score of rural college students in the multiple classification table is given as 23.91 and the adjusted mean mathematics achievement score of same sub sample is given as 23.04, both values being almost the same.
25) The background variable – the type of management of college does not have any significant interaction with other independent variables in the study. The unadjusted mean of mathematics achievement score of government college students (22.10) and adjusted mean of mathematics achievement score of government college students (22.38) are almost the same. Similarly, unadjusted mean of mathematics achievement score of private college students (23.87) and adjusted mean of mathematics achievement score of private college students (23.84) are also almost the same.

26) The low and high groups in the selected independent variable - emotional intelligence - have significant interaction with other independent variables in this study. From the multiple classification analysis table, it can be seen that the respective unadjusted and adjusted mean mathematics achievement scores of both low (16.93, 19.48) and high (28.79, 26.87) scorers in emotional intelligence scale are showing much difference.

27) The average group in the selected independent variable - emotional intelligence - has no significant interaction with other independent variables in this study. From the multiple classification analysis table, it can be seen that the respective unadjusted and adjusted mean mathematics achievement scores of average (23.56, 23.58) scorers in emotional intelligence scale do not show much difference.
Summary of the Study, Conclusions and Suggestions

28) The low and high groups in the selected independent variable - locus of control - have significant interaction with other independent variables in this study. From the multiple classification analysis table, it can be seen that the respective unadjusted and adjusted mean mathematics achievement scores of both low (17.99, 22.39) and high (28.48, 25.11) scorers in locus of control scale vary very much.

29) The average group in the selected independent variable - locus of control - has no significant interaction with other independent variables in this study. From the multiple classification analysis table, it can be seen that the respective unadjusted and adjusted mean mathematics achievement scores of average (24.38, 23.35) scorers in locus of control scale do not show much difference.

30) The low and high groups in the selected independent variable - rigidity - have significant interaction with other independent variables in this study. From the multiple classification analysis table, it can be seen that the respective unadjusted and adjusted mean mathematics achievement scores of both low (28.04, 25.48) and high (18.20, 22.15) scorers in locus of control scale vary very much.

31) The average group in the selected independent variable - rigidity - has no significant interaction with other independent variables in this study. From the multiple classification analysis table, it can be seen that the respective unadjusted and adjusted mean mathematics scores of average (24.02, 23.20) scorers in rigidity scale do not show much difference.
6.3 TENABILITY OF HYPOTHESIS

The tenability of hypothesis in this study is given below:

The first part of the hypothesis states that there is significant correlation between each independent variable with the dependent variable. The major finding No.1 shows that there is positive and significant relation between emotional intelligence and mathematics achievement for the general sample and sub samples based on sex, location of institution and type of management of college. The major finding No.2 shows that there is positive and significant relation between locus of control (internality score) and mathematics achievement for the general sample and sub samples based on sex, location of institution and type of management of college. The major finding No.3 shows that there is negative and significant relation between rigidity and mathematics achievement for the general sample and sub samples. Hence first part of the hypothesis is fully substantiated.

The second part of the hypothesis states that there is significant difference in the scores of the dependent variable for any two contrasted groups developed on the basis of the scores in each of the independent variables (low, average and high groups developed for each independent variable). The major findings Nos. 4 to 12 show that for any two contrasted groups developed on the basis of the scores in each of the independent variables (low, average and high groups developed for each independent variable) show significant difference in the mean scores of mathematics achievement. Hence the second part of the hypothesis is fully substantiated.
6.4 CONCLUSIONS OF THE STUDY

The major conclusions arrived at from this study are following:

CONCLUSION - I

a) There is a significant and positive relation between emotional intelligence and mathematics achievement for the general sample and sub samples. For every unit increase or decrease in emotional intelligence score there will be a corresponding increase or decrease in the score of mathematics achievement.

b) There is a significant and positive relation between locus of control (internality score) and mathematics achievement for the general sample and sub samples. For every unit increase or decrease in internal locus of control score there will be a corresponding increase or decrease in the score of mathematics achievement.

c) There is a significant and negative relation between rigidity and mathematics achievement for the general sample and sub samples. For every unit increase in the score of rigidity there will be corresponding decrease in the score of mathematics achievement and vice versa.

CONCLUSION - II

a) The mean scores of mathematics achievement of any two contrasted groups of emotional intelligence taken at a time (pair-wise) show significant difference at .01 level. The mathematics achievement of students having high emotional
intelligence is significantly high when compared to the mathematics achievement of students having average and low emotional intelligence. The mathematics achievement is significantly higher among students having average emotional intelligence than students having low emotional intelligence.

b) The sub samples in the study such as females in each of the three groups (low, average and high) based on emotional intelligence and private college students in the average emotional intelligence group are the high scorers among the respective sub samples compared in the mathematics achievement test.

c) The mean scores of mathematics achievement of any two contrasted groups of locus of control taken at a time (pair-wise) show significant difference at .01 level. Mathematics achievement is significantly higher among students having average locus of control than students having low locus of control (externals). Mathematics achievement of students having high locus of control (internals) is significantly higher compared to the mathematics achievement of students having average and low locus of control.

d) The sub samples in the study such as females, urban college students and private college students in each of the three groups based on locus of control (low, average and high) are the high scorers among the respective sub samples compared in the mathematics achievement test.

e) The mean scores of mathematics achievement of any two contrasted groups of rigidity taken at a time (pair-wise) show significant difference at .01 level.
Mathematics achievement is significantly higher among students having low rigidity than students having average rigidity. Mathematics achievement of students having low rigidity is significantly higher while comparing with the mathematics achievement of students having average and high rigidity.

f) The sub samples in the study such as females in each of the three groups of rigidity (low, average and high), urban college students and private college students in the low and average rigidity groups are the high scorers among the respective sub samples compared in the mathematics achievement test.

**CONCLUSION –III**

There is difference in coefficients of correlation between mathematics achievement and each of the three selected independent variables. But this difference is statistically significant between certain pairs of sub samples only. Thus for those pairs of sub samples, which show significant difference in correlation coefficient (denoting the relation between mathematics achievement and a particular independent variable), the scores for mathematics achievement for unit increase or decrease in that independent variable, will be much different. While in those pairs of sub samples in which there is no significant difference in correlation coefficients (denoting the relation between mathematics achievement and a particular independent variable), the scores for mathematics achievement for unit increase or decrease in the score of that independent variable, will be almost the same.
CONCLUSION - IV

a) The relation between emotional intelligence and mathematics achievement is positive and significant when the effects of locus of control and rigidity are partialled out using partial correlation technique for the general sample and sub samples.

b) The relation between locus of control (internality score) and mathematics achievement is positive and significant when the effects of emotional intelligence and rigidity are partialled out using partial correlation technique for the general sample and sub samples such as females, urban college students and private college students.

c) The relation between rigidity and mathematics achievement is significant when the effect of emotional intelligence and locus of control are partialled out using partial correlation technique for the sub samples such as females and rural college students only. The relation is found to be negative for all sub samples.

d) There is significant relation between mathematics achievement and combined effect of the three independent variables such as emotional intelligence, locus of control and rigidity for the general sample and sub samples (the coefficients of multiple correlation obtained are all above 0.630).
CONCLUSION -V

a) Multiple regression analysis carried out to assess the influence of the three independent variables such as emotional intelligence, locus of control and rigidity on mathematics achievement shows a very high percentage (82.8%) of variation in the score of mathematics achievement which is explained by these selected independent variables.

b) It has also been found that emotional intelligence is the highest influencing independent variable on the score of mathematics achievement of students, followed by locus of control (internality score). In the case of rigidity, there is only negligible unit change in the score of mathematics achievement.

c) The three multiple regression equations developed in the study can be used to predict the score of mathematics achievement of students when the score of emotional intelligence, locus of control, rigidity and nature of the background variables taken in the study are known.

6.5 SUGGESTIONS OF THE STUDY

The study could reveal the nature of mathematics achievement of students at degree level. The nature of the three independent variables such as emotional intelligence, locus of control and rigidity and their influence on mathematics achievement of degree students also was revealed. The nature and influence of background variables such as sex, location of institution and type of management
of college on mathematics achievement were also identified in this study. In the light of the findings of the study, some suggestions are made.

• The present study could reveal that emotional intelligence is the most highly influencing independent variable on the score of mathematics achievement of degree students. This points out the importance of giving training to develop emotional intelligence in students. The teachers should acknowledge, accept and empathize on the feelings of their students. They should create a salubrious environment for the students so that they would be able to identify and label their feelings in a positive way and think of all possible solutions in their own way. They can help students develop the ability to manage both their emotions and their rationality by nurturing EI. The experts in education should take care of the improvement of environmental quality of colleges. The study revealed that females are more emotionally intelligent than males. So there must be special care for males while giving training in emotional intelligence. Special enrichment programmes can be arranged for the high emotionally intelligent students to prepare mathematics brains for future. Colleges can seek for the services of specialists in this field.

• Lecturers who are able to develop and practise emotional intelligence strategies using the locally available resources must be given due recognition. They may be given financial assistance to pursue their work. A particular percentage of promotion quota in the department of collegiate education of the government must be set apart for lecturers who have a proven track record in the field of developing emotional intelligence in view of enhancing mathematics achievement.
• Special programmes may be arranged for parents and other members of the family to make them aware of the role, the family has to play in developing emotional intelligence among children. Parents should not only encourage the child’s cognitive ability but also arrange the environment to make them emotionally competent.

• Curriculum should deal more explicitly with the concept of emotional intelligence and its development and management in classroom situations. In selecting and planning the curriculum, the selection and arrangement of material in subjects should be such that they are closely associated with the emotional experiences of the students.

• It has been found in the present study that the students on the upper end of the continuum of locus of control (internals) perform better in comparison with the average and with those at the lower end of the continuum of locus of control (externals) in their mathematics achievement. Hence it is suggested that lecturers should have a sincere and sensitive regard for the personal characteristics of their students, particularly in approaches that increase the students’ feeling of self. This attitude of acceptance is likely to increase the effectiveness of teaching by creating a favourable climate for learning. In the present study, it has also been found that females, urban college and private college students are the high scorers in the locus of control scale. Students with an external locus of control can be helped to foster an internal locus of control by being led through successful experiences. Such experiences help them understand that the effort they expend relates to the outcome
they experience, that their success in college is not simply an effect of luck, and that their difficulties are due either to a lack of appropriate effort or support. Students should be encouraged to evaluate their own progress and to set specific goals. This understanding often results in adopting more positive and better ways of dealing with academics.

- The present study suggests that internal locus of control characteristics of students have direct bearing on their mathematics achievement. Hence educators and educational administrators should give due consideration to the developmental aspect of these characteristics in reaching intelligent decisions relating to the improvement of mathematics achievement. The educational planners should see that the environment of college is supportive of adequate development of these characteristics so as to enhance the mathematics achievement of students.

- It has been found in the present study that females are more internally controlled than males. Hence parents should provide a positive, warm protective environment to their children, particularly to their male children. It is supported by the research findings of Davis & Phares, 1969; Levenson, 1973; and Mac Donald, 1971. They found that consistency of parental reinforcement, discipline and standards seem linked to the development of internality, especially in boys.

- Training in social skills must be provided to students in the college. Colleges can seek the services of social learning therapists. They always attempt to raise their clients’ expectancies for reinforcements. Since locus of control is a generalized
expectancy, it will predict students’ behaviour across situation. When students have low expectancies, therapists attempt to increase students’ confidence by using their therapeutic influence to help students (a) gain insight into the irrationality of their expectancies and/or (b) attempt behaviour they have been avoiding out of fear of failure. Therapists would help students to develop reasonable and achievable goals for themselves. It is better to strive, step by step, to achieve a series of goals than it is to set one distant, lofty goal for oneself. Hence college authorities may make sufficient arrangements for conducting the social skills training programme for their students.

- It has been found in the present study that rigidity is negatively related to mathematics achievement. Mathematics lecturers should be trained in psychology of learning mathematics and the learners’ viewpoint. Hence thereby translating stereotyped mathematical commands into day–to–day understandable language. Mathematics lecturers need to be flexible. This is because Mathematics learning and teaching are dynamic and subject to change, as there is not the only one way to teach mathematics. This is also due to the fact that a flexible teaching philosophy allows them to accommodate various methods of learning, greater diversity and varied goals students bring with them to mathematics classroom. Thus good mathematics lecturers should embrace or at least recognize the constant change that the field is ever going through. Additionally, they should always try different teaching methods, provide opportunities that promote interaction, collaboration and shared reflection among students, and strive to search out new ideas. In the hope of
finding what works the best, mathematics lecturers should constantly attempt to incorporate various methods and approaches that bring more success to students’ mathematics learning experience.

- The atmosphere of the college must not be in a rigid manner. It should nurture a greater sense of safety, security, warmth and motivation for the accomplishment of any educational task. In the present study, it is found that males, rural college and government college students are the high scorers in the rigidity scale. Hence they should be helped by the teachers to be able to lower their level of rigidity, because it is detrimental to their mathematical performance. A continued effort to assess the influence of rigidity on mathematics achievement may reveal how educators can alter environments to ensure the mathematics success of all students.

- Parents should take friendly care and support to instil a healthy and congenial environment for their children. Harsh punishments, sarcastic comments and negative attitudes are to be avoided to develop positive outlook among their children with a well-adjusted personality.

- College curricula of mathematics should not be divorced from the socio-cultural substratum; rather a blend of history, culture, excitement and relevance of mathematics needs to be psychologically synthesized and practically blended. More research should be conducted in this area to suit to the needs of students of differing psychological backgrounds. Hence the department of mathematics may provide more guidance and financial assistance to pursue their work.
• Preparation of psychological profile of students may be made mandatory in colleges. This would give a brief sketch of the psychological characteristics of each student which would be of immense help for the individual as well as for others in many ways. It will be a useful database for the educational administrators, policy makers and researchers. In the preparation of psychological profile, the different psychological tests and inventories should be administered and scored strictly under the guidance of experts in this field. It is found in the study that students are differing very much in their psychological factors. It is also found that the influence of these factors on mathematics achievement is at varying degrees. So the government must arrange special training, at least for one lecturer each from every college in the state in educational psychology and psychometric techniques. Such specially trained lecturers should be able to administer different psychological tests and questionnaires to students, score them and categorize them accordingly. Interviews and other appropriate techniques may be used to get a complete picture of the psychological background of the learners. Once the abilities and shortcomings of the learners are thus identified, specialized and individualized instruction can be given to the learners so that they can reach higher levels of achievement.
6.6 SUGGESTIONS FOR FURTHER RESEARCH

The present study was conducted to assess the influence of the selected independent variables on mathematics achievement of students at degree level. Some of the desirable areas for further research observed by this study are the following:

1. A study of this kind can be conducted at post-graduate level.

2. Factorial studies can be conducted on the relationship between mathematics achievement and the different dimensions of emotional intelligence, locus of control and rigidity to reach at more conclusive results.

3. This study can be extended to other subjects like science, social science, etc. and can be replicated on a wider sample.

4. It may be worthwhile to extend the study of this kind to other universities.

5. A cross-cultural study can be conducted on the relationships of emotional intelligence, locus of control, rigidity and mathematics achievement.

6. An experimental study may be conducted with regard to the practice of Yoga and meditation for enhancing emotional intelligence of students at university level.

7. A study can be done for the development of innovative strategies for enhancing internal locus of control of students.

8. A study can be made much more extensive by incorporating certain socio-psychological factors like socio-economic status, home environment, self-concept, achievement motivation and other variables.
References

