CHAPTER 9

REVIEW, CONCLUSIONS AND SUGGESTIONS

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CHAPTER IX

REVIEW, CONCLUSIONS AND SUGGESTIONS

9.1 REVIEW

This present study was carried out with a view to measure the critical thinking of secondary school students of the Gujarat state.

The problem of present study was, "CONSTRUCTION AND STANDARDIZATION OF CRITICAL THINKING TEST FOR SECONDARY SCHOOL STUDENTS OF GUJARAT." That means the investigator had constructed and standardized the critical thinking test. The construction means to construct the items for the test and standardization means norms of the test should be established. Critical Thinking means purposeful self regulatory judgment which results in interpretation, analysis, evaluation as well as explanation of the evidential.

The investigator had decided the following objectives for the present study,

1. To construct the critical thinking test for secondary school students of Gujarat

2. To standardized the critical thinking test for secondary school students of Gujarat

3. To study the critical thinking of secondary school students in relation to Gender.

4. To study the critical thinking of secondary school students in relation to Area.

5. To study the critical thinking of secondary school students in relation to Grade.

6. To study the critical thinking of secondary school students in relation to Age.
7. To study the critical thinking of secondary school students in relation to Anxiety.

The present study was limited only for secondary school students who were studying in Grade VIII, IX and X of Gujarat State. The sample for present study was 5672 students selected by stratified random sampling method. Survey method was used for the present study. The purpose of this study was construction and standardization of critical thinking test for the secondary school students belonging to Grade VIII, IX and X having age group 12-16 from urban and rural area of the Gujarat State. The other objectives of the present study was to find out the relation between the students belonging to different variables i.e. gender, area, grade level, age group and anxiety on mean scores of critical thinking.

The investigator had decided to construct verbal type of test for critical thinking. Critical thinking test has six components: (1) Perception (2) Assumption (3) Fallacy (4) Argument (5) Logic and (6) Problem Solving. The steps of construction and standardization of critical thinking test are as follows,

1. After deciding the component of the test the investigator constructed critical thinking test which contains 72 items.

2. After constructing the critical thinking test which contains 72 items was given to experts like lecturer and professor of education college and senior teachers. Then the IOC value for each item was found out. None of them was rejected, so after modification 72 items remained for pre-pilot try out.

3. The pre-pilot study was carried out on 244 secondary school students. Those items which were ambiguous to students either due to language or due to the construction of items were identified. The identified items were corrected or if required to be removed. 3 items out of 72 items were rejected so only 69 items remained for pilot try out.
4. The pilot study was conducted on 350 secondary school students. Item wise analysis was carried out carefully by $\chi^2$ technique. The investigator selected 58 items out of 69 items for final form of critical thinking test.

5. The final form of critical thinking test as well as associated instructions to be given to the students were decided. Since the answer should be given in separate answer sheet, about 1000 booklets and 6500 answer sheet were decided to print. The total numbers of items in final form is 58 which were given to 5672 students of secondary school of Gujarat State. Then different norms were established.

6. After establishing the norms, the reliability was found out by different methods. The reliability coefficients vary from 0.887 to 0.987. Therefore the test is highly reliable. Then the concurrent validity, content validity and factorial validity have been studied. The validity varies from 0.799 to 0.961. So the critical thinking test has fairly high validity.

7. Mean, Standard Deviation, t-test and F-test were applied to analysis the obtained data. The data was analyzed according to hypothesis. The results obtained from analysis of data were presented in seven parts are as follows:

1. Significance of difference between the mean scores of critical thinking of students belonging to different gender i.e. boys and girls.

2. Significance of difference between the mean scores of critical thinking of students belonging to different area i.e. urban and rural.

3. Significance of difference between the mean scores of critical thinking of urban boys and rural boys.

4. Significance of difference between the mean scores of critical thinking of urban girls and rural girls.
5. Significance of difference between the mean scores of critical thinking of students belonging to different grade levels i.e. Grade VIII, IX and X.

6. Significance of difference between the mean scores of critical thinking of students belonging to different age levels i.e. 12, 13, 14, 15 and 16 years.

7. Significance of difference between the mean scores of critical thinking of students belonging to different anxiety levels i.e. high and low level.

9.2 THE RESULTS OF THE TEST

Results of the test were given below:

1. Total 58 items are selected in the critical thinking test. The difficulty value of items is between 0.35 to 0.85.

2. The discriminating value of 58 items of the critical thinking test is between 0.21 to 0.45.

3. The reliability coefficient of the critical thinking test varies from 0.887 to 0.987. In which the reliability coefficient obtained by test-retest method is 0.901 for short interval and 0.91 for long interval. In split-half method the reliability coefficient obtained by Spearman Brown Formula is 0.887. The reliability coefficient obtained by KR-20 Formula is 0.973, by using the KR-21 Formula the reliability coefficient is 0.987 and with the using of Tucker's method the reliability obtained 0.970. Therefore the test is highly reliable.

4. The inter correlation coefficient between the scores on perception component, assumption component, fallacy component, argument component, logic component and problem solving component are 0.960, 0.872, 0.906, 0.904, 0.887 and 0.896 respectively. It shows that all the parts have in common one fundamental function. In the factor analysis of
the test the first factor loading obtained is 97.58 %, this factor shows the critical thinking.

9.3 The Major Finding of the Correlated Studies

The major findings of the present test are as follows,

1. There was no significant difference in the mean scores of critical thinking between boys and girls of secondary school students of Gujarat. That means the critical thinking found same in both boys and girls of secondary school of Gujarat.

2. There was no significant difference in the mean scores of critical thinking between students of urban and rural area. That means the critical thinking found same in both urban and rural area school student. It indicates that area seems to have no role in determining one’s critical thinking.

3. There was no significant difference in the mean scores of critical thinking between urban boys and rural boys. It indicates that the urban boys and rural boys have the same critical thinking.

4. There was no significant difference in the mean scores of critical thinking between urban girls and rural girls. It indicates that the urban girls and rural girls have the same critical thinking.

5. There was a significant difference in the mean scores of critical thinking between different grade levels of secondary school students. The mean score on critical thinking of students belonging to Grade X is higher than that of Grade VIII and IX. While the mean score of students of Grade IX is higher than that of Grade VIII but smaller than that of Grade X. The obtained F-ratio shows that the mean scores of critical thinking of students between different grade levels were significant.
6. There was a significant difference in the mean scores of critical thinking between different age groups of secondary school students. The mean score on critical thinking of students belonging to age 16 is higher than that of 11, 12, 13, 14, and 15. The mean score on critical thinking of students of age group 12 has the lowest value than that of age 13, 14, 15, and 16. The obtained F-ratio shows that the mean score on critical thinking of students between different age groups were significant.

7. There was no significant difference in the mean scores of critical thinking between different anxiety levels of secondary school students. It indicates that the anxiety difference does not affect to critical thinking of students.

9.4 SUGGESTIONS

1. For Teachers

   To develop critical thinking the teacher should conduct activities inside and outside the classes. For example, to arrange the debate competition, essay writing competition and give practical in the science laboratory.

2. For Educationist

   The curriculum will prepare such that it increases the critical thinking of students. For example, put some problems, some claims that misguide us in the curriculum.

9.5 EDUCATIONAL IMPLICATIONS

   The present test was constructed and standardized for secondary schools of Gujarat state belonging to age group 12-16 and Grade VIII, IX and X.

   ➢ This test will be useful in knowing the level of critical thinking. It will be more useful at the time of planning individuals' guidance for secondary school students of Gujarat.
The present test can help in classifying the student of secondary school of Gujarat. The differences of students in their critical thinking would be useful for the teachers to teach.

The test can be used to give educational and vocational guidance.

9.6 SUGGESTIONS FOR FUTURE RESEARCH

Any research can become a seed for future research. Based on the present research the investigator recommends future researches as highlighted below.

1. One may develop test to study critical thinking of Gujarat State students belonging to other grade levels i.e. Grade V, VI and VII.

2. One may undertake the research to study the effect of different variables such as S.E.S., academic achievement and I.Q. scores on the critical thinking score.

3. One may develop a programme of enhancing critical thinking of secondary school students of Gujarat.

4. The researcher may study the effectiveness of critical thinking to emotional quotient of students.

5. One may adopt and standardize this test in English for the students of English medium school.

9.7 CONCLUSION

If this standardized critical thinking test help to measure and identify needs of students of secondary school of Gujarat to improve their critical thinking the investigator will feel modestly the goal of this research is achieved.