



## ACHIEVEMENT IN CHEMISTRY IN RELATION TO TEHR TEST ANXIETY OF HIGHER SECONDARY STUDENTS

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### ABSTRACT

The present study was aimed to investigate the level of achievement in chemistry and test anxiety of higher secondary students. Survey method was conducted on a simple random sample of 800 higher secondary students in Cuddalore District. Test Anxiety Inventory by Ganesan, P. (2006) was used for the study. Data was analyzed by Mean, SD, t-test, F-test and r-value. Results found that the higher secondary students have moderate level of test anxiety and shown high achievement in chemistry. Findings also indicated that there is significant difference between male and female students & rural and urban students except the other sub-samples i.e. type of school and religion with respect to their achievement in chemistry; in case of test anxiety, a significant difference found between male and female, rural and urban & government and private school students except religion. Further the study has also showed a significant negative relationship existed between achievement in chemistry and test anxiety of Higher Secondary Students.

**KEYWORDS:** Test Anxiety, Achievement in Chemistry, Higher Secondary Students.

### INTRODUCTION : Chemistry Education

Chemistry education is a comprehensive term that refers to the study of the teaching and learning of chemistry in all schools, colleges and universities. Topics in chemistry education might include understanding how students learn chemistry, how best to teach chemistry, and how to improve learning outcomes by changing teaching methods and appropriate training of chemistry instructors, within many modes, including classroom lecture, demonstrations, and laboratory activities. There is a constant need to update the skills of teachers engaged in teaching chemistry, and so chemistry education speaks to this need.

### Chemistry in Higher Secondary Stage

Higher Secondary Stage is the most crucial stage of school education because at this stage a special discipline based, content oriented courses are introduced. Students reach this stage after 10 years of general education and opt for Chemistry with a purpose of mostly for pursuing their career in basic sciences or professional courses like medicines, engineering, technology and studying courses in applied areas of science and technology at tertiary level. Therefore, at this stage, there is a need to provide learners with sufficient conceptual background of Chemistry, which will make them competent to meet the challenges of academic and professional courses after the higher secondary stage.

### Academic Achievement

Academic achievement or academic performance is the outcome of education - the extent to which a student, teacher or institution has achieved their educational goals.

### Anxiety

Anxiety is one of the fundamental sensations of humans. All human beings become little anxious when faced to a perilous situation. The temporary and situation dependent kind of anxiety, created by dangerous situations, is called as situational-anxiety (Spielberger, 1966).

### Need and Importance of the Study

Examinations have been accepted as an important aspect of the educational system. Examinations have always been used as the main basis for judging a student's ability and also as a means of selection for educational advancement and employment. Although pupils may be of comparable abilities, learn in the same environment and follow the same syllabus, their academic performance still vary.

Bright students who fail to excel due to other factors miss the opportunity to advance in education and to get employment. At the same time, there are students who may be bright but perform poorly despite the good learning facilities in their schools. Among the factors that are blamed for the pupils' poor academic performance, the test anxiety is hardly mentioned. The poor performance has raised concern and efforts have been made to find out the reasons behind it. Many factors such as lack of facilities in school, lack of teachers, unfavorable learning environment, and lack of scientific aptitude, low intelligence and anxiety have been found to cause poor academic performance in chemistry.

Students who are properly guided are likely to perform well in their examinations particularly in chemistry subject. Even though many factors that closely related to students' achievement in chemistry the present investigation is taken up only the test anxiety as variant.

### OBJECTIVES OF THE STUDY

- To find out the level of achievement in chemistry of higher secondary students.
- To find out the level of test anxiety of higher secondary students.
- To study the significant difference between the sub-samples of the students under various categories with respect to their achievement in chemistry.
- To study the significant difference between the sub-samples of the students under various categories with respect to their test anxiety.
- To examine the significant relationship between higher secondary students' achievement in chemistry and their test-anxiety.

### HYPOTHESES

1. There is no significant difference in achievement in chemistry of higher secondary students in terms of gender.
2. There is no significant difference in achievement in chemistry of higher secondary students in terms of locality.
3. There is no significant difference in achievement in chemistry of higher secondary students in terms of type of school.
4. There is no significant difference in achievement in chemistry of higher secondary students in terms of religion of students.
5. There is no significant difference in test anxiety of higher secondary students with regard to gender.
6. There is no significant difference in test anxiety of higher secondary students with regard to locality.
7. There is no significant difference in test anxiety of higher secondary students with regard to type of school.

8. There is no significant difference in test anxiety of higher secondary students with regard to religion of students.
9. There is no significant relationship between achievement in chemistry and test anxiety of higher secondary students.

### Tools

- Test Anxiety Scale by Ganesan, P. (2006).
- The students' half-yearly examination marks in Chemistry subject taken as achievement scores.

### Sample of the Study

The present study was conducted with 800 higher secondary students studying in various higher secondary schools of Cuddalore District in Tamil Nadu. The sample was selected by using simple random sampling technique.

### Data Analysis

**Table 1: Level of Achievement in Chemistry Scores of Higher Secondary Students**

| Sub-sample    | N   | Mean  | SD    |
|---------------|-----|-------|-------|
| Entire Sample | 800 | 70.66 | 11.09 |

From Table-1, the achievement in Chemistry of entire sample of higher secondary students is high.

**Table 2: Level of Test Anxiety Scores of Higher Secondary Students**

| Sub-sample    | N   | Mean  | SD   |
|---------------|-----|-------|------|
| Entire Sample | 800 | 25.58 | 4.30 |

From Table-2, the test anxiety of entire sample of higher secondary students is moderate.

**Table 3: Achievement in Chemistry of Higher Secondary Students based on Gender**

| Gender | N   | Mean  | SD    | t-value | Remark      |
|--------|-----|-------|-------|---------|-------------|
| Male   | 355 | 66.72 | 11.05 | 9.36    | Significant |
| Female | 445 | 73.80 | 10.07 |         |             |

From Table-3, the t-value is 9.36 which is significant at 0.05 level. Hence the hypothesis-1 is rejected.

**Table 4: Achievement in Chemistry of Higher Secondary Students based on Locality**

| Locality | N   | Mean  | SD    | t-value | Remark      |
|----------|-----|-------|-------|---------|-------------|
| Rural    | 400 | 71.55 | 11.01 | 2.28    | Significant |
| Urban    | 400 | 69.77 | 11.11 |         |             |

From Table-4, the t-value is 2.28 which significant at 0.05 level. Hence, the hypothesis-2 is rejected.

**Table 5: Achievement in Chemistry of Higher Secondary Students based on Type of School**

| Type of School | N   | Mean  | SD    | t-value | Remark          |
|----------------|-----|-------|-------|---------|-----------------|
| Government     | 400 | 71.21 | 10.94 | 1.41    | Not significant |
| Private        | 400 | 70.11 | 11.22 |         |                 |

Table-5 shows that the t-value 1.41 is not significant at 0.05 level. Hence the hypothesis-3 is accepted.

**Table 6: Achievement in Chemistry of Higher Secondary Students based on Religion**

| Source of Variance | Sum of Squares | df  | Mean Square | F    | Remark          |
|--------------------|----------------|-----|-------------|------|-----------------|
| Between Groups     | 228.38         | 2   | 114.19      | 0.92 | Not significant |
| Within Groups      | 98063.77       | 797 | 123.04      |      |                 |
| Total              | 98292.15       | 799 |             |      |                 |

From Table-6, the F-value 0.92 is not significant at 0.05 level. Hence the hypothesis-4 is accepted

**Table 7: Test Anxiety of Higher Secondary Students based on Gender**

| Gender | N   | Mean  | SD   | t-value | Remark      |
|--------|-----|-------|------|---------|-------------|
| Male   | 355 | 27.19 | 4.45 | 9.87    | Significant |
| Female | 445 | 24.28 | 3.71 |         |             |

Table-7 depicts that the t-value 9.87 is significant at 0.05 level. Hence the hypothesis-5 is rejected.

**Table 8: Test Anxiety of Higher Secondary Students based on Locality**

| Locality | N   | Mean  | SD   | t-value | Remark      |
|----------|-----|-------|------|---------|-------------|
| Rural    | 400 | 25.21 | 4.29 | 2.38    | Significant |
| Urban    | 400 | 25.94 | 4.29 |         |             |

From Table-8, the t-value 2.38 is significant at 0.05 level. Hence the hypothesis-6 is rejected.

**Table 9: Test Anxiety of Higher Secondary Students based on Type of School**

| Type of School | N   | Mean  | SD   | t-value | Remark      |
|----------------|-----|-------|------|---------|-------------|
| Government     | 400 | 25.20 | 4.29 | 2.45    | Significant |
| Private        | 400 | 25.95 | 4.28 |         |             |

Table-9 shows that the t-value 2.45 is significant at 0.05 level. Hence the hypothesis-7 is rejected.

**Table 10: Test Anxiety of Higher Secondary Students based on Religion**

| Source of Variance | Sum of Squares | df  | Mean Square | F    | Remark          |
|--------------------|----------------|-----|-------------|------|-----------------|
| Between Groups     | 32.85          | 2   | 16.42       | 0.88 | Not significant |
| Within Groups      | 14790.64       | 797 | 18.55       |      |                 |
| Total              | 14823.50       | 799 |             |      |                 |

From Table-10, the F-value 0.88 is not significant at 0.05 level. Hence the hypothesis-8 is accepted.

**Table 11: Correlation between Achievement in Chemistry and Test Anxiety of Higher Secondary Students**

| Sub-sample    | N   | df  | 'r' value | Table value at 0.05 | Result      |
|---------------|-----|-----|-----------|---------------------|-------------|
| Entire Sample | 800 | 798 | -0.853    | 0.088               | Significant |
| Male          | 355 | 353 | -0.902    | 0.098               | Significant |
| Female        | 445 | 443 | -0.767    | 0.088               | Significant |
| Rural         | 400 | 398 | -0.828    | 0.098               | Significant |
| Urban         | 400 | 398 | -0.853    | 0.098               | Significant |
| Govt.         | 400 | 398 | -0.768    | 0.098               | Significant |
| Private       | 400 | 398 | -0.953    | 0.098               | Significant |
| Hindu         | 519 | 517 | -0.822    | 0.088               | Significant |
| Muslim        | 106 | 104 | -0.898    | 0.179               | Significant |
| Christian     | 175 | 173 | -0.917    | 0.146               | Significant |

From Table-11, the correlation for the entire sample is negative and significant. The same trend is witnessed in all cases of sub-samples. Hence it is concluded that there is significant negative relationship exists between the achievement in chemistry and test-anxiety of higher secondary students.

### FINDINGS OF THE STUDY

1. The achievement in chemistry of entire sample of higher secondary students is high.
2. The test anxiety of entire sample of higher secondary students is moderate.
3. There is significant difference between male and female higher secondary students with respect to their achievement in chemistry.
4. There is significant difference between rural and urban higher secondary students with respect to their achievement in chemistry.
5. There is no significant difference between government and private higher secondary school students with respect to their achievement in chemistry.
6. There is no significant difference among mean achievement in chemistry scores of higher secondary students with respect to their religion.
7. There is significant difference between male and female higher secondary students with respect to their test anxiety.
8. There is significant difference between rural and urban higher secondary students with respect to their test anxiety.
9. There is significant difference between government and private higher secondary school students with respect to their test anxiety.
10. There is no significant difference among mean test anxiety scores of higher secondary students with respect to their religion.
11. There is significant negative relationship between achievement in chemistry and test anxiety of higher secondary students.

### RECOMENDATIONS

On the basis of this study following recommendations are made:

To reduce students' test anxiety, the teachers and parents should concentrate on students routine educational practices, by means of

- Developing good study habits and strategies
- Managing time
- Organizing material to be studied and learned.

- Avoiding outside pressures due to success/failure consequences (grades, graduation), peer pressure, competitiveness, etc.
- Reviewing past performance on tests to improve and learn from experience.
- Particularly, since chemistry is to be treated as a laboratory oriented subject instead of mere theoretical subject, the teacher should provide the maximum chances to the students to make use of laboratories and should correlate with day to day utilization also.
- Further, instead of compelling the students to do regular laboratory works, they may be allowed to implement their creative inventions through various scientific experiments.

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