

## **Effect of Information Processing Approach in Enhancing Achievement in Chemistry at Higher Secondary level**

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### **Abstract**

Teaching is considered both an art and a science. Successful and effective teaching requires two basic things. The teacher should be competent to teach the subject allotted to him/her at the same time he/she should follow new techniques of teaching to make the learning fruitful and interesting. The traditional methods of technology have failed to generate the required behavioural outcomes, abilities and skills needed to facilitate the learning of curricular subjects. Knowledge of the recent development will help the teacher in making his/her teaching more effective and increase his/her efficiency for class room functioning. Such a background will solve classroom problems, enable him/her to organize teaching activities and select instructional design and teaching models and innovative techniques appropriate for his/her classroom situation. All innovative strategies and techniques, it should give enough scope for developing learning environment among students. Processing information is the main concern of any teacher. If the information is processed effectively, learning techniques should be right and they should meet the individual needs of all learners and so the teachers should adopt a model of teaching which would be flexible and interactive. The information processing approach technique in teaching chemistry was effective in Higher Secondary School classes. Implementation of this approach provided a great opportunity, to students to take an active part in the process of learning. Through the information processing approach the achievement of student was enhanced to a great extent.

**Keywords:** Information, Processing, Model, Chemistry

### **1. Introduction**

The aim of teaching any school subject must always be directed towards achieving the aims of education in general. The teaching of science as a subject must, therefore contribute to the all-round development of the child so that he comes out as socially useful and efficient citizen of the modern scientific world. According to the Kothari commission (1964-66) "The destiny of the country is being shaped in her class rooms". To achieve the above goals and to meet the situation in a suitable way the teacher has to play a very vital role in educational institution and come into the lime light. Teaching is considered both an art and a science. Successful and effective teaching requires two basic things. The teachers should be competent to teach the subject allotted to him/her at the same time he/she should follow new techniques of teaching to make the learning fruitful and interesting.

### **2. Discussion**

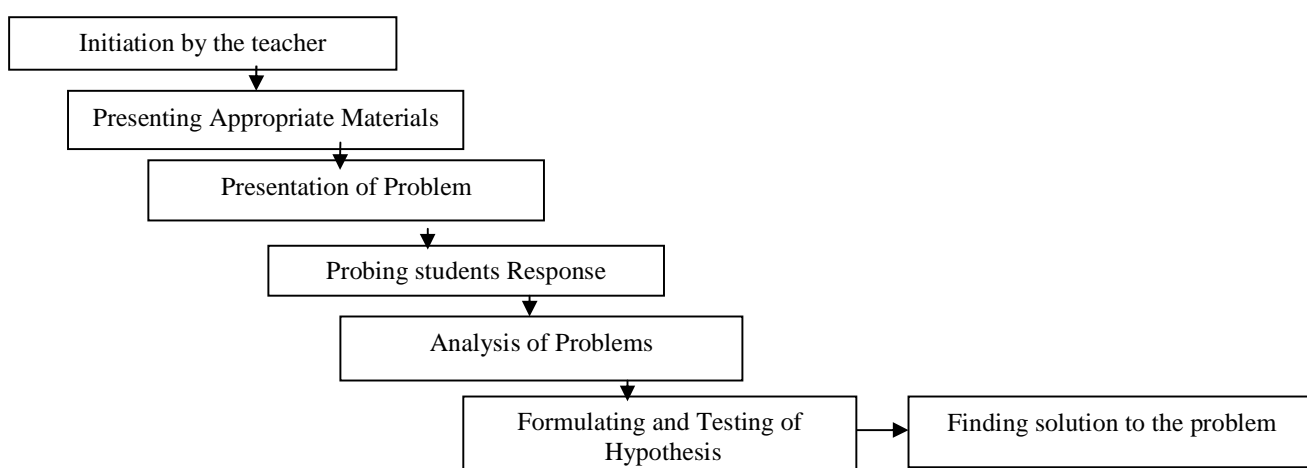
National policy on education (1986) proposed the need for modifying curriculum and methodologies of learning through appropriate research. This can be achieved by the process of sensory integration which plays an important role in the processing information among higher secondary school students and hence, this research is attempted for the betterment of the teaching learning process. In our system of examination

where cramming and rote learning are encouraged, strategies such as information processing will be useful in making learners think originally and critically. It is hoped that the effect of sensory enhancement will promote attention and be get strategies that would help the learner process information in a logical manner. Instead of making the learner simply reproduce the textual materials with or without understanding, the information processing approach will enhance achievement and it will encourage learner to think and understand the subject matter. This will go a long way in making the teaching-learning of chemistry a purposeful and meaningful activity.

The traditional methods of teaching have failed to generate the required behavioral outcomes, abilities and skills needed to facilitate the learning of curricular subjects. Knowledge of the recent developments will help the teacher in making her/his teaching more effective and increase her/his efficiency for class room functioning. Such a background will solve classroom problems, enable her/him to organize teaching activities and select instruction design and teaching models and innovative strategies and techniques appropriate for his/her classroom situation. All innovative strategies and techniques, should give enough scope for developing learning environment among students. For effective learning of a subject, effective teaching is necessary. Though many environment factors play vital role in the learning process, teaching plays the major role.

Successful and effective teaching requires two basic things. The teacher should be competent to teach the subject allotted to him/her. At the same time he/she should follow new techniques of teaching to make the learning fruitful and interesting. The traditional methods of teaching pay little attention to the psychological, biological aspects of students in learning. The teacher worries or little about the information taught has been processed or not whether it has been retrieved or recalled. Hence a necessity arose to know about the effective processing of information. This approach deals with the processes involved in receiving storing and retrieving information effectively. The information processing approach applied to the study of human perceptual and cognitive activities is useful in imaging. Now we recognize objects, and how we remember what we have understood. In other words it is based in "Cognition", which deals with processes through which information coming through the sense is transformed, reduced, elaborated and recovered. Processing information is the main concern of any teacher. If the information is processed effectively, then learning techniques should be right and they should meet the individual needs of all learners and so the teachers should adopt a model of teaching which would be flexible and interactive. The information processing approach technique in teaching CHEMISTRY was effective in Higher Secondary classes. The Experimental method was adopted by the investigator as the study is experimental in nature.

### 3. Information Processing Approach Model



**Step 1:** To apply information processing approach to enhance achievement at higher secondary level in teaching Chemistry.

**Step 2:** To identify the portions in higher secondary Chemistry syllabus to be taught through the information processing approach.

**Step 3:** Selection of the sample by the random sampling method only 20 students be included in the experimental group.

**Step 4:** Parallel group method is to be employed. (Control-experimental Groups)

**Step 5:** To measure the entry behavior of the group by administering a test (pre-test)

**Step 6:** To teach the group based on the model of teaching through the information processing approach.

**Step 7:** To assess the terminal behavior of the group by administering test (post-test)

**Step 8:** To find out a greater effectiveness of teaching through the information processing approach model compared with of other methods.

**Step 9:** To identify how far teaching through the information processing approach model has enhanced the achievement level of students to a greater degree than teaching through conventional methods.

1. The information processing approach enhances the achievement of learners in chemistry. The statistical analysis of the post-test performance of the experimental group confirmed this.
2. The mean score differences of the post-test between the control and experimental group students are significant.

Implementation of this approach provided a great opportunity to students to take an active part in the process of learning. Through the information processing approach the achievement of student was enhanced to a great extent.

#### **4. Construction of tool**

The researcher constructed a questionnaire. The investigator constructed an achievement test to two levels for the pre-test and post-test.

#### **5. Validity of the tools**

Validity of a test is defined to be accuracy with which a test measures. The purpose and validity of a test are closely related. A research tool should have reliability and validity. The content validity of the pre-test was established by critical analysis to be done by experienced chemistry teachers. On the basis of the modifications suggested by the panel of experts necessary changes were carried out in the question paper. Thus the content validity of the tools was established.

#### **6. Reliability of the tools**

The consistency in the measurement of a test is called its reliability. A test should yield the same result when it is valued on different occasions by the same individual. A test is reliable to the extent that it measures accurately and consistently from time. The reliability of a tool shows its stability (or) stable form. The consistency of measurement observed for the same individual on different occasions can be established by one of the techniques. (1) Split-half (2) Test-retest (3) Alternative(or) parallel method (4) KR20 technique (or) Rational equivalence. In this study the researcher has followed KR20 technique, for establishing reliability. The reliability value for the pretest and post achievement test were found to be 0.91 respectively. It shows the tools designed by the researcher were highly reliable. The method of rational equivalence attempts to get an estimate of the reliability of a test and is free from objections raised against the other methods mentioned earlier. This method stresses the inter correlations of the items in the test as well as a whole.

#### **7. Scheme of data analysis**

Mean, S.D, scores were calculated Non parametric tests like Mann Whitney'U' test, Wilcoxon's matched pairs signed rank test, Pearson rank correlation test and 't' test were also done to verify how far the

teaching learning process through the information processing approach model had improved the learners achievement in chemistry.

Major findings

1. the experimental and control group students do not differ significantly in their pre-test scores. This implies that the two group students were equal in their academic performance before the implementation of the program.
2. The information processing approach enhances the achievement of learners in chemistry. The statistical analysis of the post-test performance of the experimental group confirmed this.
3. The mean score differences on the post-test between the control and experimental group students is significant.
4. The performance of experimental group students in learning chemistry has considerably improved after the implementation of the program.

### **8. Educational Implications**

The investigator has established the fact that if the students are taught chemistry through information processing approach model, they will be able to understand chemistry very easily. The study shows that this approach could be more effective, in learning chemistry as well as other curricular subjects.

1. In this approach the teacher strives to facilitate the learners construction of meaning and the processing of information to make it more manageable and understandable.
2. The students must be encouraged to put questions on the topic. The teacher should guide the students by giving suggestions and by probing students responses. On the basis of the responses the teacher must redesign his instructional strategies.

Teaching techniques may vary depending upon the subject we teach and largely depend upon the biological, psychological and environmental background of the learner. This new approach is expected to bring fruitful results to students. The steps involved in the information processing approach provides greater opportunities to learners to take part in the process of learning actively in all stages. This approach will increase the involvement and interest of the learners. The main problem which concerns all teachers at all stages of teaching is the facilitation of learning, as teachers are regarded as facilitators of learning. Only effective teaching leads to purposeful learning. When the investigator adopted the information processing approach the achievement of the students was enhanced to a great extent. If every institution adopts this novel method of teaching, learning of chemistry will be made easy to the students.

### **9. Suggestions for further research**

1. The present study was carried out only in teaching chemistry similar studies may be carried out in teaching other science subjects also at the higher secondary level.
2. The present study was carried out only with a limited sample. The sample size may be increased in order to generalize the findings.
3. separate studies may be carried out for boys and girls.
4. The study may be conducted in other higher secondary schools of Tamilnadu, South India.
5. Detailed studies may be carried out by relating the steps involved in the information processing approach to the cognitive processes.
6. The same investigation may be carried out in arts subjects.
7. The investigation may be extended to graduate and post graduate levels to find out the effectiveness of the approach at the tertiary level.
8. The study may be conducted in rural schools so as to see how far the place plays its role in dividing the efficacy information processing approach model.

### Conclusion

The information processing approach technique in teaching chemistry was effective in XI standard of Vairams Matriculation Higher Secondary School, Pudukkottai, Tamilnadu, South India as per the results obtained through the study. So it was a challenging experience to the teacher. When the investigator adopted the information processing approach the achievement of students was enhanced to a great extent. The traditional approach seems to be a one way process where as the information processing approach is a two way communicating, interacting medium between teacher and learner. Hence all teacher education courses should include this approach to mark the shift from mere pedagogy to technical innovation.

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