EFFECTIVENESS OF SELF LEARNING MODULES ON PROCESS SKILLS IN SCIENCE IN RELATION TO STUDY HABITS OF CLASS IX STUDENTS

Dr. Seema Sareen
Assistant Professor, Dev Samaj College of Education, Sector 36-B, Chandigah, India

Abstract

The current study was conducted with an aim to see the relative effectiveness of self learning modules and traditional method of teaching on acquisition of process skills in science among class IX students in relation to their study habits. The present investigation was experimental in nature following quasi experimental method with pre-test and post-test non equivalent group design. The study was conducted on a sample of 200 students 100 in control group and 100 in experimental group. The experimental group was taught through self learning modules and control group was taught the same topics through traditional method of teaching. An achievement test in process skills developed by the investigator was used as pre test as well as post test and study habits inventory by N.S. Yadav was used to collect data. The obtained data were analysed by employing t test and 2X2 ANOVA. The results of the study indicated that both methods of teaching i.e traditional as well as self learning modules enhance the process skills among students but, teaching through self learning modules is more effective as compared to traditional method as it results in significantly higher gain in process skills than traditional method of teaching.

Key Words: Self Learning Modules, Process skills, Science , Study Habits, class IX

Introduction

Education and its objectives have undergone a incredible change in the past few years. In the twenty first century, the science has attained an immense social significance and accordingly there is a great change in the objectives of teaching of science. The modern curricular developers now stress that science curriculum should emphasize the development of process skills among students. Process skills are also sometimes referred to as the scientific process and these are the tools which most rational beings use. The main role of teacher is to provide such opportunities to the students so as to develop process skills among them. By using a process skills approach to classroom instruction the student will be able to apply the learnt concept in their real life. The study conducted by Chun-Yen Chang and Yu-Hua Weng (2002) on 153 tenth-grade students indicated a significant correlation between students’ problem-solving ability and their science-process skills (r = 0.35-0.57, p < .01). In addition, higher-ability and lower-ability problem were found to differ significantly in their process skills. On the basis of their research, Risa L. Reyes (2003) recommended for the deliberate teaching of thinking skills in the classroom. More emphasis is being laid over methods and techniques that may help the students to acquire process skills or problem solving skills instead of merely helping them to acquire knowledge. As a result the method that promote self-learning and discovery are being duly promoted in the teaching learning process. Mahapatra, B.C.(1995) , Pant (1997) , Narula, T.R. (1999) Mohammed K. Khalil (2017) found self learning modules as superior strategies of teaching compared to conventional method of teaching. The learning through self learning modules is one such technique which gives consideration to individual differences

Objectives of the Study

Following are the major objectives of the study:

1. To develop self learning modules in selected topics of science for class IX students
2. To study the effectiveness of traditional lecture method on process skills of students
3. To study the effectiveness of Self learning Modules on process skills of students
4. To find out whether self-learning modules result in better acquisition of process skills as compared to lecture method.
5. Whether the students with different study habits differ in acquisition of process skills irrespective of teaching strategy.
6. To study the interactional effects of teaching strategies and study habits on acquisition of process skills

Hypotheses

The present study was conducted to test the following hypotheses:

1. There is no significant difference in pre test and post test scores on process skills of the group taught by conventional method
2. There is no significant difference in pre test and post test scores on process skills of the group taught by Self learning Modules
3. There will be no significant difference in gain scores of process skills between the groups with regards to teaching method.

4. There will be no significant difference in gain scores of process skills with regard to study habits.

5. There will not be any significant interaction between instructional strategies and study habits.

**Design of the Study**

The present investigation was experimental in nature following quasi experimental method with pre-test and post-test non equivalent group design. The study involved two independent variables namely, Teaching strategies and study habits and one dependent variable i.e. acquisition of process skills. To study the main effects and interaction effects of independent variables of Teaching strategies and study habits on dependent variable of acquisition of process skills technique of 2x2 analysis of variance was employed. Independent variable of teaching strategies was varied at two levels i.e. traditional (Lecture) method of teaching and teaching with the help of self-learning modules. Furthermore from each of these two levels the groups having poor and good study habits were identified on the basis of median scores.

**Sample**

In the present study samples was drawn from the population of all IX class students studying in Government Model Senior Secondary Schools of Union Territory of Chandigarh. Sample was raised through random cluster sampling technique. First of all two schools namely, Government Model senior Secondary school Sector 37 and Government Model Senior secondary School sector 46 were randomly selected from the total population of schools. From each school two sections were randomly selected. Each of these sections was randomly assigned to group I and group II. Initially the sample consisted of 213 subjects, which was gradually reduced to 200 students because 13 students did not take part in the complete experiment. Among the sample of 200 students Group I comprised of 100 and group II also comprised of 100 students. Keeping in view the availability, feasibility and objectives of the experiment intact sections of class IX were selected for the study in natural settings. All these students were pursuing the same course of study under Central Board of Secondary Examination, New Delhi with the same official medium of instruction as English.

**Tools Used**

1. Study Habit Inventory by N.S Yadav was employed to measure study habits
2. Self-learning modules developed by the investigator.
3. An achievement test to measure acquisition of process skills developed by the investigator was used as pre-test and post test

**Procedure**

The following procedure was adopted to conduct the experiment:

**Phase - I (Pre Test Phase)**

In this phase process skills test and study habits and test were administered to the whole sample. Both these groups were administered these tests one by one.

**Phase - II (Experimental Phase)**

In this phase, assignment of strategy of instruction was done randomly Group I was taught through traditional method i.e. lecture method and Group II through self learning modules. The lessons based on these methods of teaching were planned from their course of study in science at class 9X level. Same topics were taught to both groups.

**Phase - III (Post Test Phase)**

Immediately after the treatment was over the subjects were administered the acquisition of process skills test (which was used in pre test) as posttest.

**Statistical Techniques Employed**

The following statistical techniques were used to

1. t-test was employed to see the individual effectiveness of methods of teaching on acquisition of process skills.
2. Analysis of variance (2X2) was employed to study the main effects as well as interaction effects

**Results and Discussion**
Table 1 t ratio between pre test and post test scores of Group I (Taught through Conventional Method)

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>t Value</th>
<th>Level of Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre test</td>
<td>23.40</td>
<td>5.74</td>
<td>3.51</td>
<td>.01</td>
</tr>
<tr>
<td>Post Test</td>
<td>26.42</td>
<td>6.41</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

It is clear from the results entered in Table 1 that t value of 3.51 between pre test and post test scores of group I is significant at .01 level indicating significant difference in pre test and post test scores of group I on process skills test. Thus, it can be inferred that traditional method of teaching enhances process skills among students.

Table 2 t ratio between pre test and post test scores of Group II (Taught through Self Learning Modules)

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>t Value</th>
<th>Level of Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre test</td>
<td>22.54</td>
<td>5.32</td>
<td>4.69</td>
<td>.01</td>
</tr>
<tr>
<td>Post Test</td>
<td>26.29</td>
<td>6.11</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Results entered in Table 1 show that t value of 4.69 between pre test and post test scores of group II is significant at .01 level indicating significant difference in pre test and post test scores of group II on process skills test. Thus, it can be inferred that teaching the students through self learning Modules enhances process skills among students.

Table 3 Summary of 2X2 ANOVA

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F-Value</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teaching Strategies (A)</td>
<td>53.93</td>
<td>1</td>
<td>53.93</td>
<td>8.53</td>
<td>.01</td>
</tr>
<tr>
<td>Study Habits (B)</td>
<td>54.95</td>
<td>1</td>
<td>54.95</td>
<td>8.69</td>
<td>.01</td>
</tr>
<tr>
<td>Teaching Strategies X Study Habits (AXB)</td>
<td>5.34</td>
<td>1</td>
<td>5.34</td>
<td>.85</td>
<td>Not Significant</td>
</tr>
</tbody>
</table>

Main Effects of A (Teaching Strategies)

F ratio of (8.53) for the main effects of teaching strategy on acquisition of process skills was found to be significant at .01 level. This implies that both the groups differ on the mean scores of the acquisition of process skills. The difference in means cannot be attributed to sample or chance error. Thus, there is significant differences in acquisition of process skills between the groups with regards to teaching methods. The higher mean scores of group II i.e the group taught through Self learning Modules than group I i.e the group taught through conventional method indicate that self-learning modules are more effective in acquisition of process skills as compared to traditional method of teaching.

Main Effects of B (Study Habits)

F ratio of (8.69) for the main effects of study habits on acquisition of process skills was found to be significant at .01 level of significance. The result revealed real difference in the mean scores of acquisition of process skills between the groups having good study habits and poor study habits. The higher mean scores of group having good study habits shows that the group having good study habits gains more in process skills as compared to the group having poor study habits.

Interaction between Teaching Strategy and Study habits (AXB):

F-ratio (0.85) was found to be insignificant. The results revealed that all the four groups namely A1B1, A1B2, A2B1, A2B2 did not differ significantly on mean scores of process skills. There is no interaction between teaching strategy and different types of study habits (i.e. poor and good).

Educational Implications

The findings of the present study have many important implications for improving the quality of instructions in the acquisition of process skills. The study is of great significance for teachers, teacher educators, administrators, research workers, curriculum developers and not the least, the students. Some of the recommendations based on the findings of the study are:

1. The teachers must be provided pre service as well as in service training about the assessment of process skills. They must be made aware of the concept, importance and methods of developing process skills among the students during their training.
2. In the present study teaching through self learning modules has been found to be more effective in acquisition of process skills so schools must shift emphasis from teacher dominated classroom to child centered teaching.

3. In the present study the self-learning modules have been found to be effective in acquisition of process skills as compared to lecture method, thus, teachers must be trained in development and utilization of self learning modules.

4. The present study implies that books can be written on the directions of self-learning modules.

5. The findings of the present study will help the teacher to adjust their strategies of teaching keeping in view the type of class and the type of educational objectives to be attained by the students.

REFERENCES


