

An Effectiveness of Activity Based Teaching Method on Problem Solving Ability in Learning Science Among IX Standard Students.

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Abstract:

The study was conducted to develop the activity based teaching method in science and experimenting it on the students studying in IX standard students and finding its impact on problem solving ability in science “pretest-posttest parallel equivalent groups experimental design” was followed for this study. After comparing the pretest and post test scores of both the experimental and control groups and applying statistical techniques, it reflected that there exists significant difference between the two groups. The students learning through activity based teaching learning method prepared by researcher were found to be better in their problem solving ability in science than the students learning through the traditional method of learning.

Keywords: - Activity based teaching method, problem solving ability in science, traditional method of learning.

Introduction: - Problem solving is the frame work or pattern within which creative thinking and reasoning take place. It is the ability to think a reason or given level of complexity. People who have learned effective problem solving techniques are able to solve problems at higher levels of complexity than more intelligent people have not such training. In general, the state of tension is created in mind when an individual force a problem.

The problem solving is a process of overcoming difficulties that appear to interfere with the attainment of a goal. Simple problem can solve by instinctive and habitual behaviors. More difficult problems require a series of solution attempts, while the successful solution is reached problems require a series of solutions attempts, until the successful solution is reached problems still more difficult require a degree of understanding, a perception of the relationship between the significant factors of a problem.

Statement of the problem: - “An Effectiveness of activity based teaching method on problem solving ability in learning science among IX standard students”.

Objectives of the study: -

1. To develop activity based teaching method in science for IX standard students.
2. To study the effectiveness of activity based teaching method on problem solving ability in science on problem solving ability.

Hypothesis of the study: -

1. There is no significant difference between the pretest and posttest problem solving ability scores towards science of IX standard students in control group.
2. There is no significant difference between the pretest and posttest problem solving ability scores towards science of IX standard students in experiment group.
3. There is no significant difference between control group and experiment group with respect to pretest and posttest problem solving ability towards science of IX standard students.

Scope of the study: -

1. The study is limited to IX standard students of Davanagere city.
2. The present study is restricted to know the effectiveness of activity based teaching method in science on problem solving ability.

Variables of the study: -

In the present study the researcher has selected variables that is independent and dependent variables.

1. Independent variable: activity based teaching method in science.
2. Dependent variable: Problem solving ability.

Methodology:

For the present experimental study two groups pretest, posttest design was used by the researcher, subjects are selected randomly from the population and assigned randomly to control and experimental groups. Each group is exported to the treatment pretest was administered on both groups. Activity based teaching method in science as a treatment was implemented on experimental group and posttest was administered after the treatment.

Tools used for the collection of data:

1. Activity based teaching method in science is developed by the researcher keeping in view the abilities and level of IX standard students.
2. Problem solving ability-tool developed by the researcher based on the creative thinking and reasoning abilities of IX standard students.

Activity based teaching method in science and problem solving ability in science includes the concepts of science for IX standards students. It is developed by the researcher keeping in view the reasoning abilities creative thinking and level of IX standard students. Here learner proceeds at his own speed and pace. Developing activity based teaching method in science is based on three chapters in science for IX standards students. One each in Physics, Chemistry and Biology. In Physics researcher selected work and energy chapter, in Chemistry the researcher selected structure of atom chapter and in Biology the researcher selected improvement in food resources chapters. The programme consists of concerned session of 45 minutes each, in each session a sub topic from the chapter was taught by applying the 5e steps of activity based teaching method i.e., engage, explore, explain, elaborate and evaluation. The control group was taught using traditional method. There were 40 students in each group. The pretest scores on problem solving ability in science of two groups were used to equate the two groups. Soon after the treatment was over posttest was administered to measure the problem solving ability in science of the students. Posttest

scores served as the data to measure problem solving ability of the students in science at a result of the treatment.

Sampling:

In the present study simple random sampling technique is used for sampling. Among secondary schools of Davanagere city. Two schools were selected randomly and 80 students of IX standard studying in these schools were selected randomly and are equated based on the achievement scores in science and are assigned equally to control and experimental group, finally to make 40 students (both boys and girls) in control group.

Analysis and interpretation of data.

Null Hypothesis: There is no significant difference between the pretest and posttest problem solving ability scores towards science of IX standard students in control group.

Alternative hypothesis: There is a significant difference between the pretest and posttest problem solving ability scores towards science of IX standard students in control group.

To test the above null statement, the paired t-test was conducted and result of the test are presented in the table given below.

Table: Summery of dependent t-test between the pretest and posttest problem solving ability scores towards science of Ix standard student in control group.

est	Mea n	SD	Diff. mean	Diff. SD	% of change	t -value	P-value
Pretest	72.10	7.12	0.35	1.61	0.49	1.3748	0.1770, NS
Posttest	72.45	7.31					

From the outcome of the analysis presented in the table, it clearly shows that, the mean and SD of pretest problem solving ability scores towards science is 72.10 ± 7.12 and mean and SD of posttest problem solving ability scores towards science is 72.45 ± 7.31 in control group. The mean of difference of pretest to posttest problem solving ability scores towards science is 0.35 ± 1.61 in control group. This difference is found to statistically not significant ($t=1.3748, p=0.1770$) at 5% significance level. Thus, null hypothesis is not rejected and alternative is rejected. It means that, the pretest and posttest problem solving ability scores towards science of IX standard students are similar in control group. In another words, no significant change was observed in problem solving ability scores towards science of IX standard students after posttest in control group.

Null hypothesis: There is no significant difference between the pretest and posttest problem solving ability scores towards science of IX standard students in experiment group.

Alternative hypothesis: There is a significant difference between the pretest and posttest problem solving ability scores towards science of IX standard students in experiment group.

To test the above null statement, the paired t-test was conducted and result of the test are presented in the table given below.

Table: Summary of dependent t-test between the pretest and posttest problem solving ability scores towards science of IX standard students in experiment group.

Test	Mean	SD	Diff. mean	Diff. SD	% of change	t -value	P-value
Pretest	72.28	8.59	18.63	6.13	25.77	19.2169	0.0001, S
Posttest	90.90	6.47					

From the outcome of the analysis presented in the table, it clearly shows that, the mean and SD of posttest problem solving ability scores towards science is 72.28 ± 8.59 and mean and SD of posttest problem solving ability scores towards science is 90.90 ± 6.47 in experiment group. The mean of difference of posttest to posttest problem solving ability scores towards science is 18.63 ± 6.13 in experiment group. This difference is found to statistically significant ($t=19.2169$, $p=0.0001$) at 5% significance level. Thus, null hypothesis is rejected and alternative is accepted. It means that, the posttest problem solving ability scores towards science of IX standard students are different in experiment group. In another words, a significant change was observed in problem solving ability scores towards science of IX standard students after posttest in experiment group.

Null hypothesis: There is no significant difference between control group and experiment group with respect to pretest and posttest problem solving ability towards science of IX standard students.

Alternative hypothesis: There is a significant difference between control group and experiment group with respect to pretest and posttest problem solving ability towards science of IX standard students.

To test the above null statement, the independent t-test was carried out and out come of the test are presented in the table given below.

Table: Summary of independent t-test between control group and experiment group with respect to pretest and posttest problem solving ability towards science of IX standard students.

Problem solving ability	Control group			Experiment group			t -value	p-value
	n	Mean	SD	n	Mean	SD		
Pretest	40	22.55	1.40	40	22.43	1.53	0.3813	0.7040, NS
Posttest	40	22.98	1.12	40	31.15	1.69	25.5204	0.0001,S
Difference	40	0.43	1.45	40	8.73	2.03	21.0842	0.0001,S

From the results of the above table, it can be seen that the following:

The mean and SD of pretest problem solving ability towards science of IX standard students in control group is 22.55 ± 1.40 and in experiment group is and in experiment group is 22.43 ± 1.53 . The difference is found to be statistically not significant with t-value i.e. 0.3813 and p-value i.e. 0.7040 at 5% significance level. Hence, null hypothesis is not rejected and alternative hypothesis is rejected. It means that, the pretest problem solving ability towards science of IX standard students is similar in control group and experiment group.

The mean and SD of posttest problem solving ability towards science of IX standard students in control group is 22.98 ± 1.12 and in experiment group is 31.15 ± 1.69 . The difference is found to be statistically significant with t-value i.e., 25.5204 and p-value i.e. 0.0001 at 5% significance level. Hence, null hypothesis is rejected and alternative hypothesis is accepted. It means that, the mean score of posttest problem solving ability towards science of IX standard students is different in control group and

experiment group. In another words, the posttest scores of problem solving ability towards science of IX standard students are significantly higher in experiment group as compared to control group. In another word, the effect of experiment group on problem solving ability towards science of IX standard students is higher as compared to control group.

The mean and SD of changes from pretest to posttest problem solving ability towards science of IX standard students in control group is 0.43 ± 1.45 and in experiment group is 8.73 ± 2.03 . The difference is found to be statistically significant with t-value i.e., 21.0842 and p-value i.e., 0.0001 at 5% significance level. hence, the null hypothesis is rejected and alternative hypothesis is accepted. It means that, the mean score of changes from pretest to posttest problem solving ability towards science of IX standard students is different in control group and experiment group. In another words, the mean score of changes from pretest to posttest problem solving ability towards science of IX standard students is significantly higher in experiment group as compared to control group. In another word, the change in problem solving ability towards science of IX standard students experiment group is higher as compared to control group.

Findings: -

1. No significant change was observed in problem solving ability scores towards science of IX standard students after post test in control group.
 2. A significant change was observed in problem solving scores towards science of IX standard students after post test in experimental group.
 3. The mean and SD of pretest problem solving ability towards science of IX standard students in control group is 22.55 ± 1.40 and in experiment group is 22.43 ± 1.53 . The difference is found to be statistically not significant.
- The mean and SD of posttest problem solving ability towards science of IX standard students in control group is 22.98 ± 1.12 and in experiment group is 31.15 ± 1.69 . The difference is found to be statistically significant.
 - The mean and SD of changes from pretest to posttest problem solving ability towards science of IX standard students in control group is 0.43 ± 1.45 and in experiment group is 8.73 ± 2.03 . The difference is found to be statistically significant.

Conclusion: -Activity based teaching method was one of the effective approaches to teach science and improve student problem solving ability in science. Activity based teaching method encouraged student participation and allowed students to observe to perform and to explore the knowledge under the guidance of teacher.

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