

Effectiveness of Activity Method on Process Skill in Science

Abstract

Since very earlier days science is being taught as one of the subject for the first 10 schooling years. The present study is intended to make some regular practice (Experiment) in a noble style in natural situations for development of a better technique of teaching learning of science in school level for the joyful learning of science. It was an experimental study and the researcher taught 10 lessons in control group and experimental group by activity method and traditional method respectively. It was found that there was significant difference between mean scores of process skill of Control group and Experimental group.

Keywords: Process Skill, Activity Method, Constructivism.

Introduction

Science is a method of investigating nature, a way of knowing about nature and discovers reliable knowledge about it. In other words, science is a method of discovering reliable knowledge about nature. There are other methods of discovering and learning knowledge about, but science is the only method that results in the acquisition of reliable knowledge.

Science as a separate subject was included in school curriculum in the beginning of nineteenth century. It was then referred to as general science and after the independence of Indian government set up the University Education Commission under the Chairmanship of Dr. Radha Krishnan and it recommended inclusion of General Science as a course of study in secondary schools. During 1947-52 the system of Basic Education, accepted as a national system of education visualized the General Science approach to teach science at elementary stage. The science education in India has been shaped by the ideas of Mudaliar Commission Kothari Commission NPE-1968, 1986 And 1992, Prof Yash Pal, NCF-2005. And now the modern science teaching is greatly influenced by constructivism which challenges to the concept of traditional knowledge transmission saying that -knowledge is not attained but constructed.

Science learning makes enhancement not only in cognitive abilities but also in affective and psychomotor abilities. The psychomotor abilities are often considered to be reflected in the process skill of learner. Constructivism, a modern paradigm of teaching also advocates in favor of acquiring of some process skill.

Science Process Skills

A Process is a series of activities or operations performed to attain certain goal or product. Science Processes are the inter-linked activities performed by any qualified person during the exploration of universe. The Science process outcomes are the intellectual skills needed for scientific investigation attained by student as a result of learning of science. In order to get a better insight into the nature of processes the investigator examined some of the important classifications attempted by top authorities in the field. Some of the representative classifications are given below.

Observing

Using the senses to gather information about an object or event.

Inferring

Making an "educated guess" about an object or event based on previously gathered data or information.

Measuring

Using both standard and non-standard measures and estimates to describe the dimensions of an object or event.

Communicating

Using words or graphic symbols to describe an action, object or event. Classifying - grouping or ordering objects or events into categories based on properties or criteria.

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Predicting

Stating the outcome of a future event based on a pattern of evidence.

Problem Solving

It consists of using generic temporary methods, in an orderly manner, for finding solutions to problems.

Scientific thinking This type of thinking can lead to experiments, and it can help people develop skills for determining whether something they hear or see is true.

Activity Method of Learning

In most of the effective methods of teaching, the involvement of the learner is most important. In most of the methods, Activity stands at the central point. It is the activity, which keep teacher, learner and content active. Different methods of teaching have different view towards the nature and role of activity but in all of those methods activity is the functional part. In lecture cum demonstration method, the demonstration is nothing but the activity. In problem solving method, activity is the way to solve problem. In scientific method activity is the experiment. In inquiry method activity is the situation, about which inquiry is done. In project method it is activity which is performed in the form of activity. In team teaching and discussion method activity is the topic of discussion. In ICT assisted method activity is the content of ICT.

To conclude it can be told that activity is the backbone of any method of teaching Science whether it performance based or discussion method. Activity is a process and as Science is also a project of every method of teaching science becomes collinear to activity. Activity is the thing which when added to any method, makes the method scientific. So it can be told activity approach of teaching is actually Science centered approach.

Objectives

To study the effectiveness of activity method on learning achievement process skill of students in science.

Hypothesis

There will be no significant effect of activity method on process skill of students in science.

Design of the Study

The study was an experimental study, the researcher had selected two groups randomly. Treatment (Activity method) was given to one of the group randomly and other group was given no special treatment. The researcher taught the control group by traditional method of teaching. The plan of the study was to check the entry behaviour of both the group and the changes of the behaviour after the treatment.

Sample and Sampling

In this study the class VII students of all the 530 middle Schools of Bilaspur were the population. Probability sampling technique was used for the sampling. By the lottery method 2 schools were selected. Twenty VII students of each school were the sample of the study.

Tools and Techniques Used

In the present study the researcher had made use of two types of tools for the data collection.

These were instructional tools and testing tools. In this study instructional tools were prepared by the researcher for

No direct instruction was given to the experimental group. The researcher had created constructivist learning situations in the form of activity. The achievement of students was evaluated by the use performance based testing tools.

Result and Discussion

Acquiring of some process skill was the objective of the teaching learning process. At the end of the teaching learning process the researcher had assessed the process skills acquired by learners. The process skills were assessed in terms of the following expected outcomes-

Table 1
Description of Scores of Process Skill

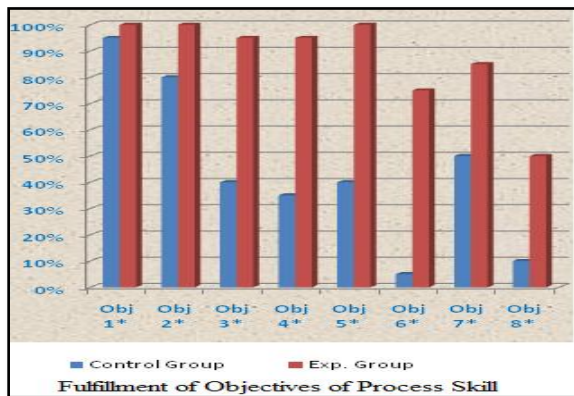
Sl. No.	Description	Control Group	Experimental Group
1	Mean	11.3	17.9
4	Percentage of students having more than 75% marks	10%	100%
5	Percentage of students having scores up to 25%	0%	0%

From the above table (Table 4.3) it is observed that mean of the scores of process skill of experimental group is higher than that of the control group. When the percentage of students having scores above 75% in process skill test is observed, it is evident from the above table that all students of experimental group scored above 75% than where as only 10% students of the control group achieved this. When the percentage of students having scores up to 25% was considered, every student of the two group scored above 25%.

The achievement of learners in different items had reflected the fulfillment of the teaching learning objectives set for the lesson. The details reflection of the objectives in the achievement of learners with respect to different process skill is mentioned in the following table.

Table 2
Fulfillment of Teaching Learning Objectives of Process Skill

Sl. No.	Name of process skill	Percentage of student who had full filled the objectives	
		Control Group	Experimental Group
1	Observing	95%	100%
2	Inferring	80%	100%
3	Measuring	40%	95%
4	Communicating	35%	95%
5	Classifying	40%	100%
6	Predicting	5%	75%
7	Problem solving	50%	85%
8	Scientific thinking	10%	50%



From the above table it is evident that all most all students had acquired skill of observation and Inferring. When the skill of measuring and communicating is considered performance of experimental group was better than the control group. Similar result was found in the skill of classifying and predicting.

There the difference was larger in the same direction. The problem solving skill was much better in the experimental group than the control group. Scientific thinking was reflected in the behaviour of students of experimental group in a much better way than the control group

Table 3
Comparison between the Pre Treatment Achievement of Experimental and Control Group

Sl. No	Source of Variation	SS	df	MS	f value	F critical	Remark
1	Between Groups	452.2	1	452.2	60.7*	7.352	Significant
2	Within Groups	282.9	38	7.4			

From the above table it is seen that the calculated f value is 60.7, which is greater than the critical f value (f_{crit} 2.71) at 0.01 level of significance, with degree of freedom 1 & 38. It indicates that mean scores of process skill of control group and experimental group differ significantly. Thus the null hypothesis that, **“There will be no significant difference between mean scores of process skills of Control group and Experimental group”** is rejected at 0.01 level of significance. It can be said that the overall difference among the 2 means are significant and not due to chance. It is due to the treatment.

This indicates that the students of experimental group had learnt better process skill than the control group. This finding was similar to the findings of Rajndran M (2012) Yilmaz et al. (2010) Nilgfc & Ken (2011) During the instructional process no direct instructions were given to the experimental group. Students were given enough freedom to perform activities for learning. Due to this students had learnt better psychomotor abilities. These abilities were reflected in their performance of process skill. In the control group the students were told the functioning of the activities but their knowledge was theoretical. They had faced trouble to translate their theoretical knowledge in to practice when they were asked to do some activity.

During the performance of activity, students of experimental group were working in group. As a result of this they had learnt the skill of working in a group with cooperation and the skill of leading the group in terms of collaborative performance. Nothing such happened with the control group as no activity was performed by them during teaching learning process. Due to these cause students of control group faced problem to handle the instruments properly, to reach accurate result, to answer the questions asked during activity. They had also faced problem to recognize the instruments which were required for performing the activity. When the performance of experimental group was analyzed, they were found to become more comfortable in those areas.

Conclusion

It was observed that the students of both the control and experimental group were taking part in the discussion. But the quality of discussion was more objective in the experimental group. Students were always interested to perform activity. The learning was joyful for them. It was surprised to observe that the students of the experimental group were learning without instruction and their performance was better than the control group students in most of the classes. Class control in the experimental group was much easier than that of control group. Students of experimental group had learnt the skill of working in a group and leading the group.

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