International Journal of Multidisciplinary Research and Development
Online ISSN: 2349-4182, Print ISSN: 2349-5979, Impact Factor: RJIF 5.72
www.allsubjectjournal.com
Volume 3; Issue 9; September 2016; Page No. 250-251

Effectiveness of different methods of teaching on academic achievement in chemistry of high school students of Jabalpur

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Abstract
The main objective of the study was to study the effectiveness of chemistry teaching by activity method, smart class and demonstration method on academic achievement of high school students. To obtain the above objective 3x2 ex-post facto research design has been used. 120 students of high school studying in English medium, private schools of Jabalpur (M.P.) were selected for the study. For the implementation of the study lesson transcripts based on activity method, smart class and demonstration method have been used. Finally Achievement test in Chemistry has been implemented on the students. The finding of the study shows that Academic achievement in chemistry is higher among the students of high school when they taught by the Activity method.

Keywords: Methods of Teaching, Activity method, Smart class, Demonstration method & Academic Achievement in Chemistry

1. Introduction
Teaching consist exchange of views expressions and over all knowledge between the learner and the teacher's where is bound to act as, a good communicator in the class. He should have meaningful learning experience with which he would deliver his skills by virtue of his model of gesture which are accepted by the learners. A learner must have a feeling inquisitiveness with which an open ended question between the teacher and the learner who can ask questions relevant to the topic specified to the teaching as generalized in the class.
People learn in different ways, some like to see the main points written down in order to remember then, others learn better by listening, some may like to hear information repeated a few times in different ways, while some need to touch and feel something before they can fully learn it.
The main goals of science education are to prepare students to make responsible decisions concerning science related social issues and inform students about possible science careers. To reach these goals, different learning environments, teaching approaches and methods are important aspects to consider also in school chemistry education for instance, Satyaprakash & Behera (2014) [1] in the study on the Effectiveness of multimedia on Achievement of VIII standard students in Biology have shown that multimedia has helped learners in mastering various concepts of biology easily and effectively. Jeena Prakash Chandra (2013) [2] investigated the effect of smart classroom learning environment on Academic Achievement of Rural High Achievers & Low Achievers in Science and found the positive effect of smart class on both high achievers and slow achievers. Joyce and Hleil (2011) define teaching as information processing models, personal models, social interaction models and behaviour modification models.
All methods have their own importance. The best method can be used in teaching learning process student-centered, activity and participatory methods are essential to enhance, students attitude to learning chemistry in the high school. Therefore the investigation is keep to know the best method for chemistry teaching.

2. Objective
To compare the effectiveness of chemistry teaching by activity method, smart class and demonstration method on academic achievement of high school students.

3. Hypothesis
There is no significant difference among the mean score of academic achievement of high school students taught by smart class, demonstration and activity method.

4. Methodology
In this study 3x2 ex-post facto research design has been used to evaluate the comparative effectiveness of different teaching method on academic achievement of high school students.
Three groups of students of high school were selected for this study and were considered as experimental groups. As this is a comparison between three methods no control group was taken. Experimental group has occurred so that one can come to know which method is more effective. The students were exposed to smart class teaching, demonstration and activity based method. The effect of different methods of teaching on the respective groups were assessed with the help of pre test and post test in chemistry later the groups were compared by calculating the gain scores in achievement test in chemistry.

5. Variable
5.1 Independent variable
Methods of teaching of chemistry (i.e. smart class method, demonstration method and activity based method)

5.2 Dependent variables
Academic achievement

6. Sample

The sample of the study consisted of 120 students of high school studying in English medium, private schools of Jabalpur (M.P.). Stratified random sampling technique was adopted for the collection of data.

7. Tools

1. Methods of teaching of chemistry:- Lesson plans of smart class method, demonstration method and activity based method.
2. Academic Achievement:- Self-made questionnaire

Table 1: Table of academic achievement in chemistry of high school students of Jabalpur by different teaching methods

S. No.	Methods	N	Mean	SD
1.	Activity method	40	10.707	6.700
2.	Smart class	40	8.475	4.499
3.	Demonstration	40	7.415	5.498

Table 2: Summary table for analysis of variance of academic achievement in chemistry of high school students

S. No.		df	ss	F	Significance level
1.	Between group	2	244.840	3.896	0.023
2	Within group	118	3707.5		
df=2/118 at 0.05 significance level table value : 3.07					

It is clear from table no. 1.2 that 'f 'value at df 2/118 for academic achievement of high school students among different teaching method is 3.896 which is significant at 0.05 level of significance, it means that there is significant difference among the methods of teaching i.e. activity based, smart class and demonstration method.

As clearly shown in the table 1.1 that the mean score of academic achievements of activity based method is 10.707smart class method is 8.475 and demonstration method is 7.475. From the data it is clear that activity method is better than smart class by 2.231, also activity method is better than demonstration method by 3.23. The smart class is better than demonstration method by 1. So it can be seen that activity method students performed better than the smart class and demonstration method.

It means that academic achievements of high school students in chemistry for activity method are higher than smart class and demonstration method. Therefore, formulated null hypothesis "There is no significant difference among the mean score of academic achievement of high school students taught by activity method, smart class and demonstration method" is not accepted.

The present result also supported by Bahrami, Farid; Chegini Zahra Rahimi *et al*. (2012) [3] who stated that "The retention of math concepts by game based teaching is more effective than traditional teaching".

8. Result

There is significant difference found at 0.05 level among the Academic Achievement in

Chemistry of high school students for the different teaching methods. It means that the students will be able to understand the concept more effectively by Activity method rather than Demonstration method or Smart classes.

9. Conclusion

The above study reveals that Activity method is significantly effective among Demonstration and Smart class method for teaching Chemistry of High school students.

10. References

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