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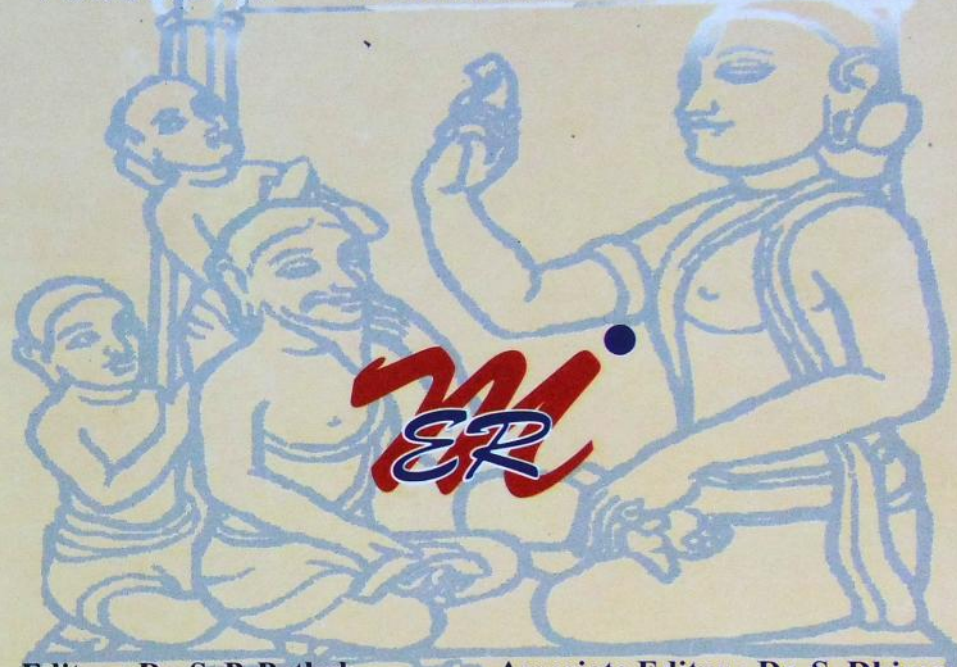

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Impact of Constructivist Learning Approach on Academic Achievement

Vimal Kishore

Abstract

The present study is an attempt towards the evaluation on the impact of constructivist learning approach on academic achievement of high school students. The sample for the purpose of experimentation was taken from two schools of Mandi district of Himachal Pradesh. Two parallel form of achievement test in subject science were used to assess the academic achievement of the learners. It consists of three parts which are classified as follows; Part-I consists of an objective type test, Part-II consists of questions that are open-ended and challenging and Part-III consists of the concept mapping type items. Analysis of the results revealed that there exists significant impact of constructivist learning approach on academic achievement of high school students. Results further revealed that the traditional method of teaching does not have any significant impact on academic achievement of the learners.

Introduction

The main focus of teaching is to bring about a desirable change in the behaviour of the learner. It is brought about by the teacher using various teaching strategies to achieve the overall educational objectives. But traditionally we have been using teaching method for content presentation. In order to increase the effectiveness of the teaching, the constructivist learning approach is used worldwide. Learning, therefore, is active mental work, not passive reception of teaching. Constructivists emphasize on discovery approach and problem-solving methods so as to result in retention and transfer of the knowledge imparted. The constructivist learning approach to learning is being considered as an innovative measure in the direction of reducing the burden of learning. Thus, constructivism encourages the construction of a social context in which collaboration creates a sense of community, and teachers and students are active participants in the
learning process. Learning capability as a psychological construct is more or less present in each and every human being. This inherent capability of the individual needs to be nourished through a well planned and level specific programme of education scientifically.

In traditional methods of teaching-learning, the secondary school teacher is the provider of knowledge and students are required to memorise this theoretically generally in the form of laws, formulae or theory and reproduce the same in the examinations. These methods are based on the objectivist view of knowledge and ignore the inquisitiveness of learners and their ability to construct new knowledge.

Constructivism is a relatively new paradigm which takes into account the subjective, contextual and pluralistic nature of knowledge. The knowledge can be expressed in the number of language and symbol forms. A problem can have a number of viable solutions.

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Considering the changing needs of the learners and the society, the National Council of Educational Research and Training (NCERT) prepared the National Curriculum Framework (NCF) in the year 2005. The NCF (2005) emphasizes 'learner-centred approach' to achieve the objectives of the curriculum. NCF, 2005 also recommends that curriculum should help learners to become constructors of knowledge and emphasizes the active role of teachers in relation to the process of knowledge construction. Learners construct knowledge while engaged in the process of learning and the teacher's role is to engage them in the process of learning through well chosen tasks and questions. Active engagement involves enquiry, exploration, questioning, debates, application and reflection leading to theory building and creation of ideas. School must provide opportunities to question, enquiry, debate, reflect and arrive at concepts or create new ideas.

In India constructivist learning approach is relatively new. Its learning suggests strong collaborative features, and therefore allows students to reap the full extent of benefits of collaborative learning. There is greater scope of the development of their academic excellence. In view of the above considerations the investigator of the present study thought to apply the constructivist learning approach in teaching science subject in a secondary school of Himachal Pradesh and to study its impact on academic achievement of the seventh class learners.

Objectives

The following were the main objectives of the study:

1. To study the impact of teaching of science through constructivist learning approach on academic achievement of the seventh class learners.
2. To study the impact of teaching of science through traditional method of teaching on academic achievement of the seventh class learners.

Hypotheses

Keeping in mind, the objectives listed above the following hypotheses were formulated for the study:

1. There exists significant difference on the impact of teaching of science through constructivist learning approach on academic achievement of seventh class learners.
2. There exists significant difference on the impact of teaching of science through traditional method of teaching on academic achievement of seventh class learners.

Research Design

The design of the study is mainly of non-equivalent control group design of the quasi-experimental type. This design has been employed to study the impact of teaching of science through constructivist–learning approach on academic achievement of seventh class learners of district Mandi (HP).

Paradigm for Design: Pretest-Posttest Non-equivalent control group design

Group	Pre-test	Independent Variable	Post-test
Experimental	T_1	Teaching through constructivist learning approach	T_2
Control	T_1	Teaching through traditional teaching methods	T_2

Sample

Out of 140 secondary schools of Mandi district of HP, the investigator purposively selected ten secondary schools those were more or less similar in nature with regard to their nature of management, infrastructure, teacher strength, student strength, year of establishment and student result etc. Out of these ten apparently equivalent schools the investigator randomly (by lottery method) selected two schools for the purpose of experimentation. As such the seventh class learners of the Government Senior Secondary School, Kanaid were taken as the subjects of the experimental group and seventh class learners of Government High School, Chambi were taken as subjects of control group. The number of subjects of the experimental group and control group was 40 and 40 respectively.

Instrumentation

In the present study, the investigator used parallel forms of self made achievement tests in the subject of science. The two parallel forms of the achievement test were sent to experts, checking and confirmation for getting their approval regarding its authenticity and classroom applicability. The parallel forms of self developed achievement tests are described in the succeeding paragraph.

Achievement test

Achievement test is used to assess the students' achievement in a particular area. In the present study the investigator used two parallel forms of self made achievement test in the subject science. It consists of three parts which are classified as follows;

a) Part–I

It is an objective type test. It is based on general science from science text books, prescribed for class seventh by H.P. Board of Education, Dharamshala as per NCERT guidelines. It consists of twenty five objective type items based on knowledge, understanding, application and skill. The items were developed from the chapters on the basis of following table of specification. The knowledge, understanding, application & skill objects were given 20%, 40%, 20% & 20% weightage respectively.

b) Part-II

It consists of questions that are open-ended and challenging. NCF-2005 strongly proposed a change in the typology of questions so that reasoning and creative abilities replace memorization as the basis of evolution. The new type of questions are short answer and long answer type and written in such a way that the answers may not be fixed but may receive individual points of views of the students. In this way the new questions are open-ended type. It consists of five subjective type items based on knowledge, understanding, application and skill. In this test students were free to express their views.

c) Part–III

This test consists of the concept mapping type items. It is based on general science from science text book, prescribed for class seventh by H.P. Board of Education,

Dharamshala as per NCERT guidelines. It consists of five items. It helps students fulfill high quality and meaningful learning outcomes. It is good exercise to ask the children to develop maps at the end of instruction to reflect what they understand as a process of summative evaluation.

Statistical Techniques Used

To test the normality of distribution of the data at pre-test level, the description measures of statistics like mean, median, mode, skewness, kurtosis, was applied and to test the impact of independent variable the inferential statistical measure 't' test was used.

Analysis and Interpretation

The data thus obtained was analyzed by using 't'-test and the results obtained are given below in three sections. Section I shows analysis of pre-test scores on academic achievement of both the control and experimental groups. Section II deals with the impact of constructivist learning approach on academic achievement and Section III deals with impact of traditional approach of teaching on academic achievement.

Section I

Analysis of pre-test scores on academic achievement of both the control and experimental groups

The statistical technique 't' test is applied to test the significance of difference between the mean academic achievement scores of the experimental and control group at the pre-test.

Table-1

Mean Academic Achievement Scores of the Experimental Group compared with that of the Control Group at the Pre-test

Groups	Tests	N	Mean	SD	't'
Control	Pre-test	40	43.95	13.57	0.04 (NS)
Experimental	Pre-test	40	44.1	13.70	

NS- Not Significant

The Table No.-1 indicates that the't' value (0.04) is not significant at 0.05 level. Hence, it can be inferred that there is no significant difference between the experimental group and control group in their academic achievement at the pre-test. Therefore, it may be interpreted that the initial mean differences that exist between the control and experimental groups with regard to academic achievement is not significant. As such, both the groups may be considered to have almost equal level of academic achievement. In other words, both the groups may be considered to be equivalent so far as their academic achievement is considered.

Section II

Impact of Constructivist Learning Approach on Academic Achievement

To know the impact of constructivist learning approach on academic achievement, the 7th grade students of experimental group were taught through constructivist

learning approach. In this context students were tested both at the pre-test and post-test level. The following table shows difference of mean scores, S.D. and 't' value of experimental group at pre-test and post-test level.

Table-2

Significance of difference between mean scores on academic achievement of experimental group at pre-test and post-test level

Test	N	Mean	SD	't'
Pre-test	40	44.1	13.70	2.36*
Post-test	40	50.85	11.89	

Significant at 0.05 level

The Table No.-2 reveals that the 't' value for the pre-test and post-test of the experimental group was found to be 2.36 which is significant at 0.05 level of confidence. Thus, it shows that teaching with the help of constructivist learning approach has a positive impact upon academic achievement. Hence, the hypothesis i.e. **"There exists significant difference on the impact of teaching of science through constructivist learning approach on academic achievement of seventh class learners"** was accepted.

Section III

Impact of traditional approach of teaching on academic achievement of control group

Table -3

Significance of difference between mean scores on academic achievement of control group at pre-test and post-test level

Test	N	Mean	SD	't'
Pre-test	40	43.95	13.57	0.15(NS)
Post-test	40	44.4	13.11	

NS- Not Significant

To know the impact of traditional method of teaching on academic achievement of 7th grade students of control group, the students were taught through traditional method by their class teacher. In this context, the students were tested both at the pre-test and post-test level. From the above table 't' value for the pre-test and post-test of control group was found to be 0.15 which is less than table value of 't' i.e. 2.02 at 0.05 level of significance. Thus the obtained value of 't' is not significant. It shows that teaching through traditional approach does not put any impact on the academic achievement of control group. Hence, the hypothesis i.e. **"There exists significant difference on the impact of teaching of science through traditional method of teaching on academic achievement of seventh class learners"** was rejected.

Major Findings of the Study

From the analysis of the obtained data we can conclude that;

1. Teaching of science through constructivist learning approach has significant

impact on the academic achievement of the learners.

2. Teaching of science through traditional method of teaching has no significant impact on the academic achievement of the learners.

Conclusion

It can be concluded that constructivist learning is more effective for the development of academic achievement than traditional lecturing methods. It also shows that constructivist learning approach is one of the potent ways of imparting science education and communicating science and technological advancements in the integrated and holistic manner. Chiniwar (2009) reported that the constructivist teacher should inquire about students' understandings of concepts before their own understandings about the concepts with them; encourage students' inquiry by asking thoughtful, open ended questions and by encouraging students to ask questions to each other; and encourage students to engage in dialogue, both with the teacher and with one another.

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