International Journal of Humanities and Social Science Research
ISSN: 2455-2070; Impact Factor: RJIF 5.22
www.socialresearchjournals.com
Volume 3; Issue 1; January 2017; Page No. 61-63

Effect of self-learning modules and constructivist approach on academic performance of secondary school students: A comparative study

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Abstract
The present paper focuses to differentiate between learning through self-learning modules and constructivist approach in relation to academic achievement of 8th class social science students'. Students for present study were selected through simple random sampling technique. This study was conducted on a sample of 60 Students of class 9th of Unique Shiksha Niketan, Ladwa, Kurukshetra. Two groups of students consisting 30 students each were formed and named as experimental group-A and experimental group-B. According to the results obtained, there exists a significant difference in academic achievement among the students learn through constructivist approach and learn through self-learning modules. Present study shows that students learn better through constructivism. Because it focuses on the students as shapers of meaning and knowledge. It is based on improving the students higher order cognitive skills i.e. problem solving, critical thinking skills, not just focusing on the content to be learned. But it tells them the way to learn. Once students understand the ways to learn, they can carry this process with them into the future life, to solve new and different problematic situations.

Keywords: constructivist approach, academic achievement, self-learning modules

Introduction

A self-learning module is a set of learning activities intended to facilitate students' acquisition and demonstration of a particular competency. Modularization increases possibilities for self-pacing, individualization, personalization, independent study and alternative means of instruction. It also permits accurate targeting for development of specific competencies. A module is a self-contained, self-pacing and self-learning material in nature. A module is a set of experiences designed to facilitate the learner's demonstration of specified objectives. Robert Mager (1990) in 'Module Development' says "A powerful way to organize instruction is to build it around a meaningful outcome or objective." The module allows the student to pace at his own rate of speed so that learning progress is known to both, student and instructor at all times and is based on measured understanding.

According to theory of constructivism, the way in which students accept and retain the knowledge is fundamental base to their learning. Individuals "construct" meaning from the world around them. Constructivism is not a teaching strategy based on a specific curriculum; it is a flexible classroom environment consistently focusing on engaging students in active learning. The role of the teacher is to create this active environment. Constructivism is a teaching activity in which students grasp the content material by actually facing the situations that require them to solve problems. By constructing upon the way they already know. The teacher provides stimulated problem based situation and tells them to solve it by using their previous experiences. Students are motivated to provide their own solution. In order for this to occur, students need to seek information, form opinions, make decisions about relevant and irrelevant information, and apply concepts to new situations. Students are empowered to "construct" their own knowledge instead of accepting information passively.

Constructivism has important implications for teaching. First, teaching cannot be viewed as the transmission of knowledge from enlightened to unenlightened. Constructivist teacher does not take the role of the "sage on the stage" rather teacher act as "guide on the side". Second, if learning is based on prior knowledge, then teachers must note down that knowledge and provide learning experience that is not accordance to learners' current understandings and the new experiences. Third, if students must apply their current knowledge in new situations in order to build new experience, then teachers must motivate students in learning by providing due importance to their current knowledge. Fourth, if new knowledge is constructed, then provide ample time for its construction. Ample time facilitates student to build about their own new knowledge and experiences. Constructivism focuses on the students as sharpen the meaning and knowledge of the cocept. It is based on improving the students higher order cognitive skills i.e. problem solving, critical thinking skills, not just focusing on the content to be learned. But it tells them the way to learn. Once students understand the ways to learn, they can carry this process with them into the future life, to solve new and different problematic situations

Rationale of the Study

Studies show that students remember 90% of what *they* say and do, but only 20% of what teachers say. This illustrates the need for creating classrooms that fit the way students learn. National Curriculum Framework (NCF) 2005 has

recommended constructivist approach for teaching of school subjects. Self-Learning modules have proved to be quite effective for teaching of all school subjects. Therefore, the researcher proposed to experimentally compare the two approaches in Teaching of Social Sciences. The subject social science has been selected because of the investigators basic qualification in social sciences at graduate and post graduate level and predominant interest in social sciences, being a teacher-educator in teaching of social sciences to B.Ed students in a College of Education.

Objectives of the Study

The following objectives of the study were formulated:

1. Preparation of Self Learning Module in Social Sciences for Ninth Grade Students.
2. Preparation of Lesson Plan of Social Sciences according to Constructivist approach for Ninth Grade Students.
3. Evolving Criterion-Referenced Tests in Social Sciences for Ninth Grade Students.
4. Comparing the Learning Outcomes in Academic Performance of the Students in Social Sciences through Self learning Module and Constructivist Approach.

Hypotheses

The following Hypotheses were formulated for experimentally studying the relative effectiveness of the two modes of Instruction:

- There is no significant difference between the Academic Performance of Social Science students to be taught through Self learning Module and Constructivist Approach before the experiment.
- There is no significant difference between the Academic Performance of Social Science students to be taught through Self learning Module and Constructivist Approach after the experiment.
- There is no significant difference in mean gain score between the Academic Performance of Social Science students to be taught through Self learning Module and Constructivist Approach after the experiment.

Methods of Research

According to the nature of the study the Experimental Method was used and Students were divided in two groups:

- Group- A Self learning Module Learners
- Group- B Constructivist Approach Learners

Design of the Study

The design of the study was pre-test, post-test experimental design. It involves two experimental groups. The first step involved pre-testing all the students on Academic Performance and Intelligence with the help of Academic Performance test and Ravens Progressive Matrices Test. In the second step the experimental Group-A was taught Social Science topic "Physical Features of India" through Self learning Module and experimental Group-B was taught Social Science topic "Physical Features of India" through Constructivist Approach. In the third step students were post tested on Academic Performance in Social Science.

Tools of Research

1. Instructional Tools

a) Self-Instructional Module in Social Science on the topic 'Physical Features of India'.
b) Lesson plan on Constructivist Approach in Social Science on the topic 'Physical Features of India'.

The Self Learning Module and Lesson plan were developed and empirically validated by the researcher.

2. Measuring Tools

a) Ravens Progressive Matrices Test to gauge students' intelligence.
b) Teacher made Achievement Test developed by the investigator.

Sample

This study was conducted on a sample of 60 Students of class 9th of Unique Shiksha Niketan, Ladwa, Kurukshetra. Two groups of students consisting 30 students each were formed and named as experimental group-A and experimental group-B.

Variables

Independent Variables: Two modes of Instruction (a) Self Learning Module (b) Constructivist Approach
Dependent Variable: Academic Performance

Control Employed

- Intelligence:- Students were equated on intelligence with the help of RPM (Ravens Progressive Matrices)
- SES (Socio-Economic Status):- To control SES students of single school was taken for experimentation.

Analysis and Interpretation

The analysis of the obtained data was done by statistics such as mean, SD and t-ratio. The results are presented in following tables

Table 1: There is no significant difference between the Academic Performance of Social Science students to be taught through Self learning Module and Constructivist Approach before the experiment

Group	Method	N	Mean	S.D.	SE_D	t-value	Level of significance
Experimental Group- A	Self-learning Module	30	10.6	2.898	0.667	0.299	Not Significant at 0.05 level
Experimental Group- B	Constructivist Approach	30	10.8	2.236			

Interpretation

Table 1 shows that calculated't' value (0.299) is not significant at 0.05 level of significance. Hence, the first hypothesis that "There is no significant difference between the academic performance of social science students to be taught through Self learning Module and Constructivist Approach before the experiment" is accepted.

It clearly shows that there is no significant difference between academic performance of social students taught through self-learning module and constructivist approach before the experiment.

Table 2: There is no significant difference between the Academic Performance of Social Science students to be taught through Self learning Module and Constructivist Approach after the experiment.

Group	Method	N	Mean	S.D.	SE_D	t-value	Level of significance
Experimental Group- A	Self-learning Module	30	14	2.113	0.77	2.935	Significant at 0.05 level
Experimental Group- B	Constructivist Approach	30	16.26	4.320			

Interpretation

Table 2 shows that obtained 't' value (2.935) is significant at 0.05 level of significance. Hence, the second hypothesis that "There is no significant difference between the academic performance of social science students to be taught through self-learning module and constructivist approach after the experiment" is rejected.

It shows that academic performance of experimental group-B is higher than the academic performance experimental group-A. So, there is significant difference in academic performance of social science students taught through self-learning module and constructivist approach after the experiment.

Table 3: There is no significant difference in mean gain scores between the Academic Performance of Social Science students to be taught through Self learning Module and Constructivist Approach after the experiment.

Group	Method	N	Mean	S.D.	SE_D	t-value	Level of significance
Experimental Group- A	Self-learning Module	30	3.46	2.955	0.875	2.285	Significant at 0.05 level
Experimental Group- B	Constructivist Approach	30	5.46	3.777			

Interpretation

Table 3 shows that mean gain scores of experimental group-A and experimental group-B are 3.46 and 5.46 respectively and the obtained 't' value (2.285) is significant at 0.05 level of significance. Hence, the third Hypothesis that "There is no significant difference in mean gain scores between the academic performance of social science students to be taught through self-learning module and constructivist approach after the experiment" is rejected.

It shows that mean gain scores of experimental group-B are higher than mean gain scores of experimental group-A. So, there exists significant difference in mean gain scores between the academic performance of social science students taught through self-learning module and constructivist approach after the experiment. It means students learn better through constructivist approach.

Conclusion

Thus study revealed that constructivist approach was more effective than self-learning module in teaching of social science. The academic performance of students of experimental group-B which was taught by using constructivist approach was higher than the students of experimental group-A which was taught through self-learning module. Students enjoyed learning when they were taught by using constructivist approach.

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