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Effect of flipped classroom instructional strategy on academic achievement

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Abstract

The purpose of the present study is to compare the academic achievement scores of students in the flipped classroom and the traditional classroom. The current research is delimited to IX class students of Ashoknagar only. Flipped class students gained better scores in academic achievement than students in the traditional classroom. There exists a significant difference in academic achievement scores of male and female students of the flipped classroom. Female students exhibited more academic achievement scores than male students in the traditional class. In the flipped classroom, male students are better in academic achievement scores than male students in the traditional classroom. Male students of flipped classroom are better academic achievers in scores than male students in the traditional classroom. It was further found that there is a significant difference in academic achievement of female students in the flipped classroom and the traditional class.

Keywords: Flipped classroom instructional strategy, Academic achievement, Geography class

Introduction

Learner-centred environment plays a valuable position in present education system (Hannafin and Land, 1997). It is a challenge to create such type of situation. Many educators and researchers support the flipped classroom model, in which teacher allocates time for active and collaborative learning, and leverage advanced tactics for activities outside the classroom, where students access digital video lectures prior to class (Bergmann and Sams, 2012) ^[4]. Flipped classroom instructional strategy is a type of blended learning in which students know about new content online or offline by watching video lectures, at home, and what used to be homework is now done in class with teachers offering more personalized guidance and interaction with students, instead of lecturing. This is also known as backwards classroom, flipped classroom, reverse teaching. Flipped classroom is joint venture of parents, students and teachers. Teacher should have mastery over the flipped teaching methodology and package. It is an innovative and exciting concept for teacher education. In this manner, students get opportunity to engage in active learning in classroom because they get time to understand the context. Thus they are ready for high order thinking activities. The flipped classroom instructional strategy has been emerged from K-12 classrooms (Ash, 2012) ^[3]. Researchers related to flipped classroom suggested that students view pre-recorded lessons as homework. Prober and Khan (2013) ^[12] proposed a flipped model for medical education. They found learners showed a favorable attitude towards FC model than the lecture-based classroom. McLaughlin *et al.* (2013) suggested that flipped classroom promoted student empowerment, development and engagement. Students reported learning more engaging and enhanced their experience of learning. They also found that their academic performance was improved. Missidine, Fountain, Summers and Gosselin (2013) ^[10] conducted a study on 589 students and found that students showed improvement in their learning outcomes. Albert and Beatty (2014) ^[2] investigated that students showed better grades in Flipped classroom. Critz and Wright found that students demonstrated increased autonomy with learning. Pierce and Fox (2012) ^[11] found that 80% of students were satisfied with the use of FC to assist their education. Students scored better in exams. Flipped classroom model can deliver diversified benefits, spanning from effective teaching to active learning and also enhanced cognitive learning outcomes of students (Aidinopoulos and Sampson, 2017),

(Aidinopoulos and Sampson, 2017), development of skills (Tanner and Scatt, 2015) as well as overall motivation (Sahin, Cavlazoglu, and Zeytuncu, 2015). Flipped classroom model received a significant level of attention from both researchers and PR actioners, spanning a range various subjects including Mathematics (Katsa *et al.* 2016), Social studies (Aidinopoulos and Sampson, 2017), Humanities (Grossman, Figueir, and Mckinley, 2015). Majority of works has investigated the impact of Flipped classroom model on a specific set of dimensions i.e. overall motivation, self-learning and cognitive learning outcomes. Hung (2015) [6] studied that students showed improvement in reading comprehension in English and improved significantly during the flipped classroom. Zappe *et al.* (2009) conducted an experiment on flipped undergraduate engineering class and concluded that students perceived the content as having a positive impact on their learning. Lai and Hu rang (2016) found that flipped classroom students exhibited higher self-efficacy than the control group and students who taught with the flipped classroom approach performed significantly better than who learned with the conventional classroom approach

Statement of the Problem

The effect of flipped classroom instructional strategy on academic achievement

Objectives

1. To study the effect of flipped classroom instructional strategy on academic achievement of students.

Research Questions

1. Is there any significant difference in academic achievement scores of students in flipped classroom and traditional classroom?
2. Is there any significant difference in academic achievement scores of male and female students in traditional classroom?
3. Is there any significant difference in academic achievement scores of male and female students in flipped classroom?
4. Is there any significant difference in academic achievement scores of male students in flipped classroom and traditional classroom?
5. Is there any significant difference in academic achievement scores of female students in flipped classroom and traditional classroom?

Delimitations of the Study

The present study is delimited to school students of Ashoknagar city only. Data was collected from students of class IX Geography only.

Sample

64 students served as a sample of the study. In present study, purposive sampling has been used for data collection. Data has been collected from Kajla Rabindra Siksha Niketan (H.S), Kajla, Ashoknagar. These 64 students were divided into two groups i.e. control group and experimental group. There were 32 students in each group. These 32 students were further categorized into 16 male and 16 female students.

Tools Used

Following tools were used for data collection:

1. Modules and video developed by the investigator
2. Academic achievement test developed by the investigator

Procedure

In present study, in traditional classroom method students were taught through lecture cum discussion method. Flipped classroom instructional method composed of two phases.

1. **FIRST PHASE:** Students used offline you tube video and worksheets supplied by teacher before coming to class. Self-study was done by students. Thus they prepared their lesson themselves before coming to class.
2. **SECOND PHASE:** Students participated in high order activities such as discussions, problem solving etc. in classroom. Teacher facilitated the classroom environment and assisted in accelerating the process of learning.

Statistical techniques employed

Descriptive statistics was used to analyze the data. For testing significance differences and effect on sample groups' T-test for small sample was used.

Table 1: Academic achievement scores of students in flipped classroom model (FCM) and traditional classroom model of teaching

	M	N	SD Or S	SE _D	T
Flipped classroom students	16.31	32	6.61		
Traditional classroom students	14.09	32	1.96	0.52	4.29

It is observed from table 1 that T-ratio for difference in academic achievement between students of FC and TC was found to be 4.29. Entering table D with 62 df, we get entries 2.00 at 0.05 level of confidence and 2.66 at .01 level. Since T value reaches at 4.29 level of confidence. So there is significant difference in academic achievement in students of Flipped Classroom and traditional classroom. The mean value of scores of flipped classroom students is higher as compared to traditional classroom. It can be stated that FC students are better in academic scores than students of traditional classroom.

Table 2: Academic achievement scores of female and male students in traditional classroom

	M	N	SD or s	SE _D	T
Traditional classroom female students	14.88	16	2.12		
Traditional classroom male students	13.31	16	0.63	0.41	3.77

It is observed from the table 2 that the t-ratio for difference in academic stress between female and male students of TC was found to be 14.88. Entering table D with 30 df, we get entries 2.04 at the 0.05 level of confidence and 2.75 at the .01 level. Since t value reaches at both levels of confidence. So there is significant difference in academic stress in male and female students of traditional classroom. The mean value of scores

of female students is higher as compared to male students. It can be stated that female students are better in academic achievement scores in male students of traditional classroom.

Table 3: Academic achievement scores of female and male students in flipped classroom

	M	N	SD or s	SE _D	T
Flipped classroom female students	18.44	16	1.41	0.5	8.47
Flipped classroom female students	14.19	16	1.42		

It is observed from table 3 that the t-ratio for the small sample for the difference in academic achievement between female and male students of FC was found to be 8.47. Entering table D with 30 df, we get entries 2.04 at the 0.05 level of confidence and 2.75 at the .01 level. Since t value does not reach both levels of confidence. So there is an insignificant difference in academic achievement in male and female students of the flipped classroom. The mean value of scores of female students is slightly higher as compared to male students. It can be stated that female students are better in academic scores in male students in the flipped classroom.

Table 4: Academic achievement scores of male students in flipped classroom and traditional classroom

	M	N	SD or s	SE _D	T
Flipped classroom male students	14.88	16	2.12	0.41	3.77
Traditional classroom male students	13.31	16	0.63		

It is observed from the table 4 that t-ratio for the small sample for the difference in academic achievement between male students of FC was found to be 3.77. Entering table D with 30 df, we get entries 2.04 at the 0.05 level of confidence and 2.75 at the .01 level of confidence. Since t value reaches both levels of confidence. So there is a significant difference in academic achievement in male students of Flipped Classroom and Traditional classroom. The mean value of scores of flipped classroom male students is higher as compared to male students of the traditional classroom. It can be stated that in Flipped Classroom male students are better in academic achievement scores than male students in the traditional classroom.

Table 5: Academic achievement scores of female students in flipped classroom model (FCM) and traditional classroom (TC)

	M	N	SD or s	SE _D	T
Flipped classroom female students	18.44	16	2	0.51	7.03
Traditional classroom female students	14.88	16	2.12		

It is observed from the table 5 that t-ratio for the small sample for the difference in academic achievement between female students of FC was found to be 0.89. Entering table D with 18 df, we get entries 2.10 at the 0.05 level of confidence and 2.88 at the .01 level of confidence. Since t value does not reach both levels of confidence. So there is the insignificant difference in academic achievement in female students of Flipped Classroom and Traditional classroom. The mean value of scores of flipped classroom female students is slightly higher as compared to female students of the traditional classroom. It can be stated that FC female students are more academic achievement than female students in the traditional classroom.

Findings and discussion of the study

Flipped classroom students gained higher academic achievement scores than students of the traditional classroom. This is consistent with results of Missidine, Fountain, Summers and Gosselin (2013)^[10]. Female students gained higher academic achievement scores than male students in the traditional classroom. Female students gained higher academic achievement scores than male students in the flipped classroom. Flipped classroom male students gained higher academic achievement scores than male students in the flipped classroom. Flipped classroom female students gained higher academic achievement scores than female students in the flipped classroom.

Implications

Although the study has been conducted on a small sample, it is giving some kind of trend with respect to Flipped classroom instructional strategy viz. academic achievement. Findings of the present study suggest that in the Indian context, Flipped classroom work better than traditional classroom. Female students exhibited more academic achievement than male students. There was higher academic achievement scores in female students than male students in the traditional classroom set up. But in Flipped classroom model, academic achievement was enhanced in female students in comparison to male students. It could be inferred that Flipped classroom works better in comparison to male students. This framework can be replicated on different samples, situations, variables, and practices for better results.

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