



BLENDED LEARNING: A FLIPPED CLASSROOM EXPERIMENT

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Abstract

The present study tries to find out the effectiveness of the Flipped classroom strategies in learning mathematics among secondary teacher trainees. The study was conducted to develop a Video lesson for the methods of teaching mathematics and experimenting the same with a set of trainees studying in the B.Ed. and finding out its effectiveness over the conventional method of teaching. Two equivalent group experimental-designs are employed for this study. The investigator has chosen 46 B.Ed. trainees for the study. According to the scoring of pre-test, 23 students were chosen as control group and 23 students were chosen as experimental group. Finally, the investigator concludes that; (a) there was significant difference between control and experimental group students in their gain scores. That is the experimental group student is better than control group students are in their gain scores, and (b) there was significant difference between control and experimental group students in their gain scores for attainment of the knowledge, understanding, and application objectives.

Keywords: *Flipped Teaching, Mathematics, Learning Performance.*



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Introduction

Flip teaching (or inverted classroom or flipped classroom) is a form of blended learning in which students learn new content online by watching video lectures, usually at home, and what used to be homework (assigned problems) is now done in class with teacher offering more personalized guidance and interaction with students, instead of lecturing. This is also known as backwards classroom, reverse instruction, flipping the classroom and reverse teaching. The notion of a Flipped classroom draws on such concepts as active learning, student engagement, hybrid course design, and course podcasting. The value of a Flipped class is in the repurposing of class time into a workshop where students can inquire about lecture content, test their skills in applying knowledge, and interact with one another in hands-on activities. During class sessions, instructors function as coaches or advisors, encouraging students in individual inquiry and collaborative effort.

Need for the Study

There is no single model for the Flipped classroom the term is widely used to describe almost any class structure that provides prerecorded lectures followed by in-class exercises. In one common model, students might view multiple lectures of five to seven minutes each. Online Copyright © 2017, *Scholarly Research Journal for Interdisciplinary Studies*

quizzes or activities can be interspersed to test what students have learned. Immediate quiz feedback and the ability to rerun lecture segments may help clarify points of confusion. Instructors might lead in-class discussions or turn the classroom into a studio where students create, collaborate, and put into practice what they learned from the lectures they view outside class. The main aims of teaching mathematics are to develop the power of abstract thinking and reasoning among the students. The traditional method also fails to draw the total attention of the learner towards learning mathematical skills and abilities. In order to overcome these practical difficulties, we could adapt the technique flip teaching for Instructing Mathematics. Since flip teaching technique helps the teacher trainees to retain their attention during instruction. This will provide opportunities for B.Ed., teacher trainees to learn at their own pace as easy as possible. Therefore, the investigator can select the topic “Effectiveness of flip/invert teaching to Enhance Mathematics learning among the Prospective Teacher Trainees”.

Definition of the Terms Flipped Teaching

Flipped teaching is a one kind of teaching model. This teaching model is using technology to change the way instructors teach. Rather than spending the class time lecturing the students, the lectures are delivered to the students in video format for them to watch at home (or in study hall). Then, the classroom time is set aside for 1 on 1 help, discussion, and interaction based on the lecture homework. It is also called as Flipped Teaching.

Enhancing Achievement in Mathematics

Mathematics Learning Performance is nothing but the students’ Mathematical achievement. Student achievement is to be finding out through the pre and posttest.

Objectives

- To develops the Flipped teaching strategies for B.Ed. teacher trainees.
- To find out whether there is any significant difference between control and experimental group trainees in their gain scores.
- To find out whether there is any significant difference between control and experimental group trainees in their gain scores for attainment of knowledge, understanding and application objectives.
- To find out whether there is any significant difference between pre-test and post-test scores of the control group trainees in their attainment of knowledge, understanding and application objectives.

- To find out whether there is any significant difference between pre-test and post-test scores of the experimental group trainees in their attainment of knowledge, understanding and application objectives.
- To find out whether there is any significant difference between pre-test and post-test scores of control and experimental group students.

Hypotheses

1. There is no significant difference between control and experimental group trainees in their gain scores.
2. There is no significant difference between control and experimental group trainees in their gain scores for attainment of knowledge, understanding and application objectives.
3. There is no significant difference between pre-test and post-test scores of control and experimental group students for attainment of knowledge, understanding and application objectives.
4. There is no significant difference between pre-test and post-test scores of control and experimental group students.

Method: Two equivalent group experimental-designs are employed for this study. To find the effectiveness of Flipped teaching strategies, the investigator has chosen Experimental research. Experimental research describes what will be when certain variables are carefully controlled or manipulated. The focus is on variable relationship.

Sample: The sample of the study consisted of 46 B.Ed. trainees studying mathematics as an optional subject from two different colleges of Education at Mahabubnagar District of Telangana State.

Tools Used

Flipped Teaching Strategies

Video lesson developed by the investigator for the methods of teaching mathematics for secondary teacher trainees. Flip teaching strategies of the specified Mathematics content of Karnataka University syllabus.

The following are some of the URL id for the investigator Video Podcast:

- https://www.youtube.com/watch?v=-15d1zQ_96g&feature=player_detailpage
- https://www.youtube.com/watch?v=abSae58T8Aw&feature=player_detailpage
- https://www.youtube.com/watch?feature=player_detailpage&v=IB7Gq-0ltqQ

- https://www.youtube.com/watch?feature=player_detailpage&v=WRePyJ-WqVk
- https://www.youtube.com/watch?v=k8aopmjeq_M&feature=player_detailpage
- https://www.youtube.com/watch?v=WxhCrQGTTDs&feature=player_detailpage
- https://www.youtube.com/watch?v=057aPzRzDhE&feature=player_detailpage
- https://www.youtube.com/watch?feature=player_detailpage&v=ZiwLoc-uPxE

Achievement Test

An achievement test in mathematics constructed and validated by the researcher.

Validity and Reliability of the Tool: The item validity was already found by doing item analysis. In order to establish content validity the tool was given to a panel of mathematics professors in B.Ed. colleges. Then the items were modified and some were eliminated based on remarks given by experts. Finally, the tool has been reduced. Thus, the content validity was established. In the present study, the investigator used test-retest method for establishing reliability. Then the product movement correlation coefficient was found and value was 0.78.

Hypotheses Testing

Hypothesis 1: There is no significant difference between control and experimental group students in their gain scores.

Table 1: Difference between Control and Experimental Group Students in their Gain Scores

Group	Mean	SD	t-value	Remark
Control	3.35	1.67	6.36	*Significant
Experimental	8.48	3.49		

(*At 5% level of significance the table value of „t“ is 1.96)

It is inferred from the above table that there is a significant difference between control and experimental group students in their gain scores. That is, the experimental group students are better than the control group students are in their gain scores. Hence, the developed flip teaching strategies is effective for the secondary grade teacher trainees.

Hypothesis 2: There is no significant difference between control and experimental group students in their gain scores for attainment of knowledge, understanding and application objectives.

Table 2: Difference between Control and Experimental Group Students in their Gain Scores for Attaining the Objectives

Objectives	Control Group		Experimental Group		t-value	Remark
	Mean	SD	Mean	SD		
Knowledge	1.65	1.30	3.30	1.58	3.87	*Significant
Understanding	1.78	1.28	3.13	1.79	2.93	*Significant
Application	1.04	0.82	2.13	1.25	3.47	*Significant

(*At 5% level of significant the table value „t“ is 1.96)

It is inferred from the above table that there is significant difference between control and experimental group students in their gain scores for attainment of knowledge, understanding and application objectives.

Hypothesis 3: There is no significant difference between pre-test and post-test scores of control and experimental group students for attainment of knowledge, understanding and application objectives.

Table 3: Difference between Pre-Test and Post-Test Scores of Control Students and Experimental Group for Attaining the Objectives

Group	Objectives	Pre-test		Post-test		t-value	Remark
		Mean	SD	Mean	SD		
Control	Knowledge	5.17	1.11	6.48	1.73	3.04	*Sig.
	Understanding	6.35	1.30	8.04	1.49	4.12	*Sig.
	Application	2.43	1.08	3.78	1.17	2.05	*Sig.
	Total	13.96	2.34	17.30	2.16	5.03	*Sig.
Experimental	Knowledge	5.26	1.71	8.56	0.79	8.41	*Sig.
	Understanding	6.52	1.30	9.65	1.56	7.39	*Sig.
	Application	2.17	0.72	4.22	1.20	6.99	*Sig.
	Total	13.96	2.80	22.43	3.06	9.80	*Sig.

(*At 5% level of significance, the table value of „t“ is 1.96)

It is inferred from Table-3, that there is significant difference between pre-test and post- test scores of the control group students in their attainment of knowledge, understanding and there is no significant difference between the pre-test and post test scores of the control group student in their application objectives. In addition, there is significant difference between pre-test and post-test scores of the experimental group students in their attainment of knowledge, understanding and application objectives. Hence, the experimental treatment is very effective.

Hypothesis 4: There is no significant difference between pre-test scores of control and experimental group students. There is no significant difference between post-test scores

of control and experimental group students.

Table 4: Difference between pre-test and post-test scores of the Control and Experimental Group Students

Group/Test (N=23)	Control Group		Experimental Group		t-value	Remark
	Mean	SD	Mean	SD		
Pre-test	13.96	2.34	13.96	2.80	0.01	*Not Sig.
Post-test	17.30	2.16	22.43	3.05	6.57	*Sig.

(At 5% level of significance the table value of „t^c is 1.96)

It is inferred from the above table that there is no significant difference between Pre-test scores of control group and experimental group students. Nevertheless, there is significant difference between Post-test scores of control group students and experimental group students.

Interpretations

The t-test result shows that the experimental group students are better than the control group students are in the gain scores. This may be due to the fact the Flip teaching strategies is effective in teaching Mathematics Education for the secondary teacher trainees. The teaching strategies of flip teaching are more attractive than the lecture method. Therefore, the student’s attention is drawn in the topic to be learnt. The t-test result also shows that the experimental group students are better than the control group students in attainment of knowledge, understanding and application level objectives in the gain score. This may be due to the fact that Flip teaching strategies has motivated the students to understand the concepts of Mathematical Education. Flip teaching is stuffed the fresh minds of experimental group students very sharply. Therefore, the experimental group is better than control group in attainment of knowledge, understanding and application objectives.

Conclusion: As the Flipped class becomes more popular, new tools may emerge to support the out-of-class portion of the curriculum. In particular, the ongoing development of powerful mobile devices will put a wider range of rich, educational resources into the hands of students, at times and places that are most convenient for them. Greater numbers of courses will likely employ elements of the Flipped classroom, supplementing traditional out-of-class work with video presentations and supporting project-based and lab-style efforts during regular class times. At a certain level of adoption, colleges and universities may need to take a hard look at class spaces to ensure they support the kinds of active and collaborative work common in Flipped classes. The Flipped classroom is a strategic direction that helps

higher education meet the expectations of today's students while optimizing teaching and classroom resources. The blended learning approach of the Flipped classroom can be leveraged for both individual courses and on an organizational level to improve instructional delivery and enhance student achievement and satisfaction.

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