



Effectiveness of Flipped Classroom on Achievement in Educational Technology of Pre-service Teachers

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Abstract: *The study was aimed at evaluating the Effect of Flipped Classroom on Achievement in Educational Technology of Pre -Service Teachers. Post test-only control group design was used. A self-made Educational Technology Achievement Test was used to collect the data from the sample consisting of 72 B.Ed trainees. The two treatment groups had strength of 36 Pre -Service Teachers in each; both the groups were matched on pre achievement scores ('t' value is not significant). The objectives and related hypotheses were analyzed by applying 't' test. The findings of the study indicated that : i) Flipped Classroom is more effective than the conventional strategy in improving the Achievement in Educational Technology of Pre -Service Teachers. ii) 2.The Male and Female Pre-service teachers taught through Flipped Classroom Instructional Strategy do not differ in their Achievement in Educational Technology.*

Keywords: *Flipped Classroom, Achievement, Pre - service teachers .*

1. INTRODUCTION:

The flipped classroom is a pedagogical model in which the typical lecture and homework are reversed. The flipped classroom instructional strategy helps in active learning, student involvement and hybrid course design. This is a type of blended learning, which aims to increase student engagement and learning by having pupils complete readings at home and work on live problem-solving during class time. The main aims of flipped classroom is: To make the classroom an active learning environment. To enable students to learn at their own pace, and. To give the instructor more time to teach each student individually, rather than the class as a whole. It is used in professional development and training settings. It can also result in high levels of student achievement more effective than traditional learning. In the present study Flipped Classroom is used to enhance the Achievement in Educational Technology of pre-service teachers.

2. LITERATURE REVIEW:

Flipped Classroom has been extensively used in different disciplines.

Debbağ, M. (2021) Conducted a study on "Effect of the flipped classroom model on academic achievement and motivation in teacher education." the main aim of the research was to study the effect of the Flipped Classroom model on the academic achievement and motivation levels of pre-service teachers. A quasi-experimental design was adopted, and the opinions of the pre-service teachers of the course were taken at the end process. The time taken for the treatments was 14-weeks. In the experimental group, an interactive and controlled online learning was used to access the Flipped Classroom videos. the findings of the study discovered that the academic achievement and motivation levels of the pre-service teachers in the experimental group were significantly higher than those in the control group. The pre-service teachers expressed that the Flipped Classroom model provided them with the opportunity to put their knowledge into practice, while also improving their teaching skills and ensuring their active participation in teaching.

Almutairi, F., Almodaires. A. & Zeyab, A. J. (2020) conducted a study on " Effectiveness of Flipped Learning: Improving Pre-Service Teachers' Prowess in Producing Videos." The main aim of the study was to find out the effect of flipped learning method in developing pre-service teachers' skills and knowledge in creating and editing videos. This research was conducted for six weeks period during the summer semester of the 2018-2019 at a teacher training college in Kuwait. The pre -test /post-test quasi-experimental design with control group was applied. The flipped learning method was applied to the experimental group while the traditional lectures for the control group. Descriptive statistics,



Mann Whitney U Test and Wilcoxon Sign Test were used in the analysis of the data. The results revealed that there is no significant difference between the pre-test and post-test scores of the experimental group and the control group. And the use of the flipped learning method in the curriculum had significantly increased the skill levels and knowledge of the experimental group pre-service teachers.

Sirakaya, D. A. & Ozdemir, S. (2018) conducted a study on “The Effect of a Flipped Classroom Model on Academic Achievement, Self-Directed Learning Readiness, Motivation and Retention”. The total 66 students who took the "Scientific Research Methods" course and were studying in two different classes in the Faculty of Education at Ahi Evran University in the fall term of the 2014 – 2015. the flipped classroom model was applied to the experimental group while a classical blended learning method was applied to the control group. An achievement test, a self-directed learning readiness scale and a motivation scale were used for data collection. The t-test, MANOVA and ANCOVA were used for data analysis. Study revealed that there was a significant difference between groups in terms of academic achievement, motivation and retention. And significant difference between the experimental and control groups in terms of self directed learning readiness was found.

Cabi, E. (2018) conducted a study on “The Impact of the Flipped Classroom Model on Students' Academic Achievement”. The main aim of this study was to find out the impact of the Flipped Classroom Model on students' academic achievement. For four weeks, the students in the experimental group were taught through the blended learning context where the Flipped Classroom Model was applied, while the control group was taught through traditional blended learning. Both groups were administered a test before and after the experiment. To analyze the data, a two-way ANOVA for Mixed Measures was employed. The results confirm that there were no statistically significant differences between the scores of the two groups.

Lo, C., Hsieh, M., Lin, H, & Hung, H. (2021) conducted a study on “Influences of Flipped Teaching in Electronics Courses on Students' Learning Effectiveness and Strategies.” This study aimed to explore the effect of learning strategies of the students under flipped teaching. The sample of this study were 85 sophomore students majoring in Electrical Engineering. The control group contains randomly selected 43 students and adopted the regular teaching method while experimental group contains 42 students, and employed the flipped teaching method. The results indicate that students under the flipped teaching model made remarkable achievement in the electronics course and the learning outcomes remained significant after a long period of time. Moreover, they made notable changes in their learning strategies: learning motivation, reading and exams, self-testing, and problem solving strategies.

Han, H. & Rokenes, F. M. (2020) conducted a study on “Flipped Classroom in Teacher Education: A Scoping Review.” Although flipped classroom has been popular in education since the 2000s, there is a lack of reviews on how the Flipped Classroom teaching approach has been applied in the field of teacher education. Most of the reviews focus either on implementation and learning outcomes with students in higher education. This article presents a scoping literature review of 33 studies published between 2014 until 2019 on flipped classroom in teacher education. The analysis identified that studies were mainly conducted in the United States, with an increased implementation in European and Asian countries, and with adoption primarily in the disciplines pedagogy, science, and language arts.

The majority of studies employed mixed methods with surveys being the most commonly used instrument to collect data. Two main focuses were identified across the reviewed studies: student perceptions and academic performance. The analysis revealed six outcomes: 1. Attitude, motivation, and emotion; 2. Content delivery; 3. Learning environment; 4. Learning experience; 5. Instructor and student presence; 6. Engagement. Based on our synthesis, we discuss current trends and future development in the research field, flipped classroom.

From the synthesis of the reviewed studies it is observed that, Flipped Classroom is undoubtedly an effective practice for Achievement. But very little effort has been done to use Flipped Classroom in teaching Educational Technology.

3. OBJECTIVES:

- To study the effect of Flipped Classroom Instructional Strategy over Conventional Strategy in enhancing Achievement in Educational Technology of Pre -Service Teachers.
- To study the effect of Flipped Classroom Instructional Strategy on Male Pre-Service Teachers and Female Pre-service teachers Achievement in Educational Technology.



3.1 HYPOTHESIS:

H0₁: There is no significant difference between the Flipped Classroom Instructional Strategy and Conventional Strategy in improving Achievement in Educational Technology of Pre -Service Teachers.

H0₂: There is no significant difference between the Male Pre-Service Teachers and Female pre-service teachers Achievement in Educational Technology improved through Flipped Classroom Instructional Strategy.

3.2 RESEARCH DESIGN:

Post test-only control group design was used. It is diagrammatically represented below.

Table 1: Schematic Representation of Treatments

Group Group	Experimental Group	Control Group
Treatment	Flipped Classroom Instructional Strategy. (X1)	Conventional Instructional Strategy. (X2)
Post test	O1	O2

3.3 SAMPLE:

The sample consisted of 72 Pre-service Teachers of the academic year 2022 at K B College of Education, Kuma (U.K) Karnaaka. Based on their pre achievement scores, matched pairs were identified and distributed into two treatment groups with 36 cases in each group.

3.4 TOOLS USED:

A self-made Educational Technology Achievement Test was used to collect the data from the sample consisting of 72 B.Ed trainees. The data for the present study was collected by using the A self-made Educational Technology Achievement Test developed by the investigator. The content validity was established by expert judgement. The coefficient of consistency by the split half method was found to be 0.95.

4. PROCEDURE OF THE STUDY:

Treatments conducted for both the groups by a single teacher having competence in both the strategies. The two groups were post-tested on achievement in Educational Technology. The experimental treatment involved in the teaching of Educational Technology. Each lesson was of one hour duration. The total fifteen lessons were taught by using Flipped Classroom Instructional Strategy to the experimental group. In the meantime, the students of Control group were taught the same lessons by using Conventional Strategy. Instantly after the completion of the treatment both the groups were Post- tested on achievement in Educational Technology.

5. DELIMITATIONS:

- ✓ Flipped Classroom Instructional Strategy can be applied to any subject area, at any level of teaching. In the present study, the background of the Researcher has enabled its application to Educational Technology at B. Ed degree.
- ✓ Flipped Classroom Instructional Strategy can be applied for different types of instruction. In the present study, it is applied to Group instruction as it is appropriate to the Indian context.

6. RESULTS:

H0₁: There is no significant difference between the Flipped Classroom Instructional Strategy and Conventional Strategy in improving Achievement in Educational Technology of Pre -Service Teachers.

To test this hypotheses t-test was applied and the results are presented in the following table.

Table-2: Shows the post test scores of Pre -Service Teachers Achievement in Educational Technology .

Treatments	N	Mean	S.D	t- value	Result
Flipped Classroom Instructional Strategy	36	21.81	1.04	8.1782	Significant at 0.05
Conventional Strategy	36	18 .75	1.89		



The calculated t-value 8.1782 is greater than the table value at 0.05 Significant level. The result is extremely statistically significant. hence, the null hypothesis (H_{01}) is rejected. Thus, the alternative hypothesis H_1 is accepted.

H_1 : There is a significant difference between the Flipped Classroom Instructional Strategy and Conventional Strategy in improving Achievement in Educational Technology of Pre -Service Teachers.

From the above Table-1, it is revealed that: There is strong evidence at the 0.05 level that the Instructional Strategies differed in how effective they were. The t- value indicates a statistically significant difference, but it did not indicate which method led to better test scores. Observing the overall means, the Experimental group has a grand mean score difference of $(21.81-18.75=3.06)$ 3.06 units higher in comparison with the Control group. This indicates that the treatment given to the Experimental group led to better test scores in Educational Technology. Thus, the experimental treatment proved to be significantly more effective. So it can be concluded that, Flipped Classroom Instructional Strategy is more effective when compared to that of Conventional Strategy in enhancing Achievement in Educational Technology of Pre -Service Teachers.

H_{02} : There is no significant difference between the Male Pre-Service Teachers and Female pre-service teachers Achievement in Educational Technology improved through Flipped Classroom Instructional Strategy.

To test this hypotheses T-test was applied and the results are presented in the following table.

Table-3: Shows T-test results of Pre-service teachers Achievement in Educational Technology improved through Flipped Classroom Instructional Strategy

Pre-service teachers	N	M	SD	t-value	Result
Male Pre-service Teachers	18	21.94	1.06	0.7994	Significant at 0.05
Female pre-service teachers	18	21.67	1.03		

The calculated t-value 0.7994 is less than the the table value at 0.05 Significant level . hence, the null hypothesis (H_{02}) is accepted.

Thus it can be concluded that, There is no significant difference between the Male Pre-Service Teachers and Female Pre-service teachers Achievement in Educational Technology improved through Flipped Classroom Instructional Strategy.

7. MAJOR FINDINGS:

- Flipped Classroom Instructional Strategy is more effective when compared to that of Conventional Strategy in enhancing Achievement in Educational Technology of Pre -Service Teachers.
- There is no significant difference between the Male Pre-Service Teachers and Female pre-service teachers Achievement in Educational Technology improved through Flipped Classroom Instructional Strategy.

8. CONCLUSION AND IMPLICATIONS OF THE STUDY:

Flipped Classroom is the practice of combining digital learning tools with traditional classroom. This is an innovative Instructional Strategy which helpful for students, teachers, Pre-service Teachers and teacher educators. This method allow Pre-service Teachers to understand deeply about the concept by helping them to what they learn, and to store and retrieve information more efficiently. Flipped Classroom Instructional Strategy also valuable tool for teacher educators to teach and train effectively.

Present study has proved that Flipped Classroom Instructional Strategy is more effective when compared to that of Conventional Strategy in improving Achievement of Pre-service Teachers in Educational Technology. This study has implications for student centric learning. It has been found to be a effective strategy to improve classroom instruction in various disciplines and hence its inclusion in the teacher education curriculum will be a major step in making its application possible. The teachers of all levels need sufficient training to use Flipped Classroom Instructional Strategy to improve Achievement in their students. Efforts in this direction will definitely bring improvement in student performance.



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