



EFFECTIVE USE OF FLIPPED CLASSROOM IN SCIENCE EDUCATION

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Abstract :

The Flipped classroom is an instructional strategy which provides additional data to the students to learn the concept before going to the classroom. This research paper includes the comparative study of teaching science education content through Flipped classroom and traditional classroom. Two groups were formed based on admission in the academic year 2018-2019 and 2019-2020 in science and technology education at PVDT College of education for women. The student's enrollment in 2018-2019 was 16 and 2019-2020 were also 18. The students enrolled in the year 2018-2019 were taught by taught by the traditional (Lecture) method and the students enrolled in the academic year 2019-2020 were taught through flipped classroom. The content taught to both classrooms is

1. *Developing a scientific attitude and scientific temper*
2. *Nurturing the natural curiosity, aesthetic sense and creativity in science*
3. *Acquiring the skills to understand the method and process of science*

In a traditional way of teaching the content was delivered through the lecture method to the students in the academic year 2018-2019

In a flipped classroom a video based on scientific attitude and temperament and written content based on natural curiosity, aesthetic sense, and various skills acquisition techniques data was provided to the students to study at home and the content was discussed through online mode using Google meet, enlarging the various ways of development of scientific attitude and inculcation of scientific temperament. Activities were conducted through online mode for nurturing natural curiosity. Skill acquisition skills were discussed through online mode in the academic year 2019-2020

The objective type test was conducted in both the years for the evaluation. The result is calculated with the help of statistical tools mean, standard deviation and 't' test.



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Keywords : Flipped classroom, scientific attitude and scientific temper

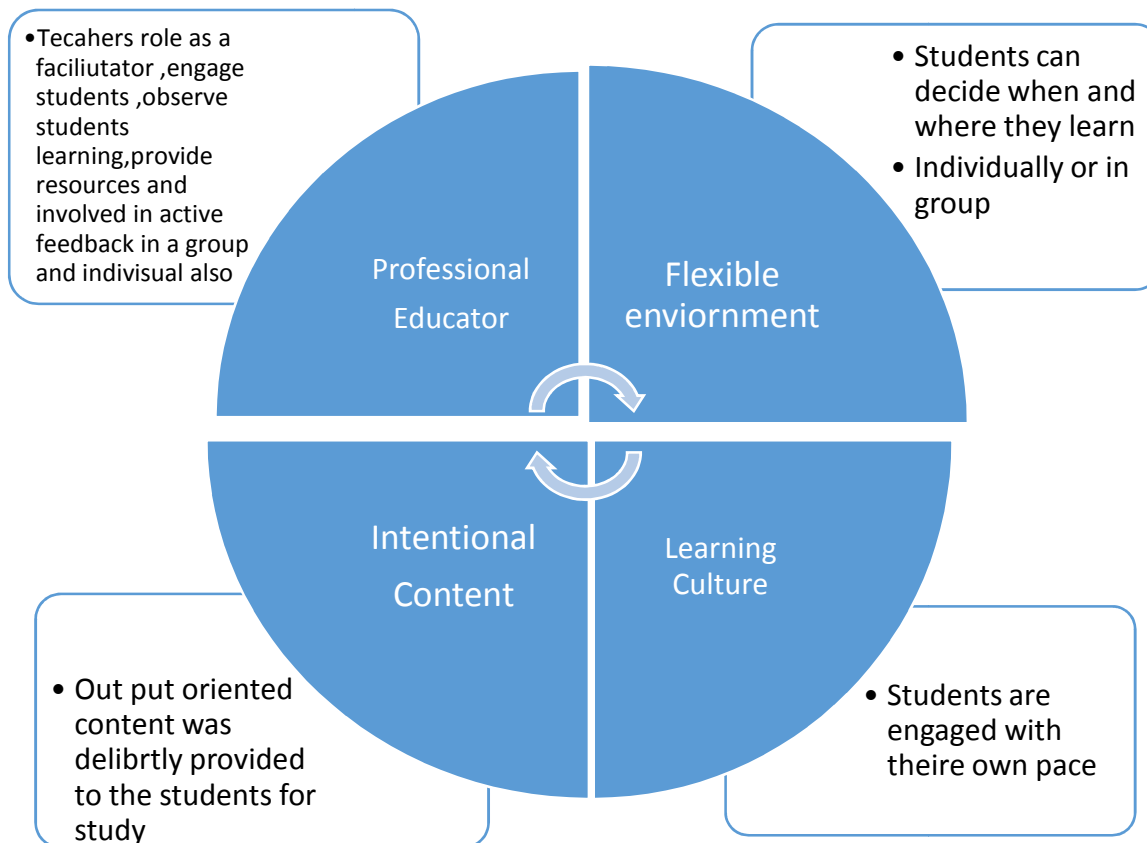
Introduction:

Flipped classroom is a way of providing instructions from group learning to the individual learning through providing learning resources for interaction by the educator. In this technique teacher provide resources probably in the form of video and instruct them to come in the classroom for the interaction by watching or reading through these resources In this class, students will go through the provided material at home or outside the classroom and come with contents in the classroom, after coming in the classroom



teacher takes the content for the discussion or hands-on activities to reach in the depth of the content. It is essential for every student to participate in the classroom as well as homework activities. In some cases, if the student is unable to understand the concept on the provided data then the concept will be cleared in a classroom through face to face interaction.

Flipped classroom has four pillars



Objectives of the Study:

1. To study the effect of Flipped classroom on the learning achievement of pre-service science teachers
2. To study the effect of traditional teaching on the learning achievement of pre-service science teachers
3. To compare the learning achievement in pre-service science teachers between Flipped classroom and traditional teaching

Null Hypotheses of the study:

There is no significant difference between the learning achievement in pre-service science teachers through Flipped classroom and traditional teaching

Scope and Limitations of the Study:

This study is limited to the 34 students of PVDT College of education for women, SNDT Women's university, Mumbai-20



Research methods: Experimental research method has been used in this research.

Sampling: Purposive sampling has been used in this research. 18 student's for experimental group and 16 students for Controlled group

Methodology: First of all researcher prepared the content based lesson plan on Flipped class room and traditional classroom. Experimental and controlled groups were formed on the basis of enrollment in academic year 2018-19(controlled group) and 2019-2020(Experimental group). After the formation of the group, the controlled group has been given experiences through traditional method and the experimental group has been given the learning experiences through flipped classroom and achievements were collected through post-test. Finally conclusions were drawn with the help of mean, standard deviation

Variables:

- 1) Independent variable - Flipped classroom.
- 2) Dependent variable – Pre-service teacher's achievement

Tools for Data Collection

1. Content based test
2. Flipped classroom plane
3. Traditional method lesson plan.

The demerits of the research:

1. The groups formed in different academic years
2. Students in the academic year 2018-2019 were 16 and in the academic year 2019-2020 Were 18.

Analysis and Interpretation of Data:

The collected data is analyzed and interpreted with mean, standard deviation and 't' test. The conclusions and recommendations based on the analysis and interpreted of the data. Following table is showing decision for acceptance of hypothesis.

Group	No. of Sample	Mean	SD	't' Value
Experimental Group	18	14	05	4.72
Control Group	16	8	02	

The 't' value is greater than sample's' value. The acquired' value is significant. As a result, flipped classroom is more useful. So the null hypothesis is rejected.

Conclusions:

- 1) The use of flipped classroom impacts positively on students learning achievement
- 2) Flipped classroom creates enthusiasm in teaching-learning
- 3) Flipped classroom improve students in self learning techniques



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- 4) Flipped classroom is help students to express their views and improve their confidence level
 - 5) Flipped classroom develops ICT skills and knowledge among the students.
 - 6) Flipped classroom is helpful to improve self acquisition skill
 - 7) Flipped classroom is helpful in developing scientific attitude and scientific temperament among students

Recommendations:

- 1) Flipped classroom should be the part of teacher education program.
- 2) In service teacher should be given training based Flipped classroom
- 3) Schools should e provide adequate resources for the Flipped classroom

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