Research Article

Effectiveness of Flipped Classroom Technique in Enhancing Academic Achievement of B.Ed Students: An Action Research

Sashapra Chakrawarty[1] & Pratima pallai[2]

[1]Associate Professor, Department of Education, Tezpur University, Tezpur, Assam

Email- sashapra@gmail.com

[2]Assistant Professor, Department of Education, Tezpur University, Tezpur, Assam

Abstract

The Flipped classroom appears to be one of the contemporary fashions in teaching-learning process. This very concept is based on the idea of active learning and student engagement. The objectives of the present paper are to investigate the overall Effectiveness and Perception of Flipped Classroom Technique in Enhancing the Academic Achievement of B.Ed. 1st Semester Students. The instructional tool used in this present study was Flipped Classroom Technique. Achievement Test was used to collect pre and post-test data to assess the student's achievement in the subject Contemporary Indian Education (CE), which is being taught in 1st semester B.Ed., Department of Education, Tezpur University, Assam. The result of the study concludes that the Flipped Classroom Technique is more effective in enhancing the overall academic achievement of B.Ed. 1st semester students with regard to mean level pre-test and post-test scores. Further, in terms of perception most students responded favourably to the fact that the flipped classroom supported their learning.

Keywords: Flipped Classroom Technique, Academic Achievement, Perception, Effectiveness, Contemporary Indian Education, Pre-test and Post-test.

Identification of the Problem

We have consistently observed for the last three years that most of the students in our Department were not techno-friendly during the teaching-learning process. As a result, we have mostly been using the lecture cum discussion methods during the teaching-learning process. However, we found that only through this method were the students not interactive and participated in the classes. Students were not able to answer during the question-answer session. They remain passive throughout the class. Being a Teacher Education Department, we offer a two-year B.Ed. Program. The main objective of this program is to prepare teachers with all requisite knowledge, skills, attitudes and behaviour. This objective can only be fulfilled through effective two-way teaching-learning experiences. We found traditional lecturer and other similar methods were not equipped with the requisite skills, which resulted in a lack of motivation and an inability to develop their teaching skills, which further led to unsatisfactory academic achievement.

Keeping in mind different teaching pedagogy, investigators thought to adopt Flipped Classroom Technique as a teaching pedagogy in 1st semester of two year B.Ed program to motivate these students towards the use of technology as their learning style, which may result in a stepping stone to increase their academic performances. Therefore, researchers decided to undertake an action research study on the topic titled "Effectiveness of Flipped Classroom Technique in Enhancing Academic

Achievement among 1st Semester B.Ed. Students of Education Department, Tezpur University, Assam".

Theoretical Perspectives of the Flipped Classroom

Digital expansions in India have extended a great thrust in the last decade. The Indian government has taken indispensable steps to digitise the campuses of higher education. This will smooth the field for all learners in relation to internet connectivity. India's initiative to make web-based resources available for the higher education segment started in the 1990s. Some top institutions of higher education, like IIT, UGC, NPTEL, CEC were the early contributers to web-based education (Dangwal & Mishra, 2020). However, with the advent of web 2.0 tools and high penetration of internet services, there is a rapid increase in the web resources created by Indian contributors. These developments set the stage for making it possible to implement technology dependent vibrant and pertinent teaching learning techniques like Flipped Classroom Model. As per the study conducted by (Srinivasan, S. & Kumar, H., 2020) suggests that Flipped Classroom Model has been effective in creating excitement and motivation in students. Most important observation from the research is that Flipped Classroom Model is not just changing the sequence of teaching but it calls for a mindset change in teachers and students to implement it at a curriculum level. Similarly, in one study it was also found that the flipped learning model can empower instructors to make the move from educator driven guideline to student focused learning (Syam, 2014).

For learners who couldn't attend the class live video recordings and screen casting software was means to record lectures, demonstrations, and slide presentation with annotations and posted them for the learners to watch and deliver (Hamdan et. al., 2013), this concept of Flipped classroom was first introduced by Jonathan Bergmann and Aaron Sams. The Flipped classroom seems to be one of the latest fashions in teaching-learning process. Flipping the classroom refers to another form of Blended Learning where a student is tasked with homework usually via a video or audio file. The classroom time is spent clarifying and applying new knowledge through problem solving and discussion method. Flipped instruction is also known as backwards classroom, reverse instruction or reverse teaching. The conception of Flipped Classroom is developed on the idea of active learning and student engagement. The classroom becomes a workshop where interaction among Educator and students takes place. Students are encouraged for individual inquiry and collaborative effort. Class time is no longer used to discourse, but instead is used for activities and problem solving (Tucker, 2012). According to Bishop and Verleger (2013), "communication between teachers and trainees will occur and will create an active learning in the classroom". Moreover, (Wilson, 2013) also agreed that the practice of flipped classroom will upsurge learners communication skills and progress their performance. Likewise, another study conducted by (Gurpreet, K., 2018) titled Effect of flipped classroom model and problem solving strategies on achievement and student engagement in mathematics in relation to critical thinking. In the study he found that the achievement of groups taught through flipped classroom model, problem solving strategies were found significantly higher than that of group taught through traditional teaching strategy in mathematics.

The flipped classroom is the antithesis of the traditional classroom transaction. According to Bergmann and Sams

(2012) "lecturers use video lectures outside the classroom and use in-class time for doing assignments or active learning activities such as problem-based learning". Kim et al. (2014) also stated that "flipped classrooms are also considered blended learning environments, using both online and face-to-face methods in teaching and learning". However, it is seen that the online element of blended classrooms usually occurs during class time, along with student-teacher collaboration (Torrisi-Steele & Drew, 2013).

Objectives

1. To investigate the overall Effectiveness of Flipped Classroom Technique in Enhancing the Academic Achievement of B.Ed. 1st Semester Students.
2. To know the Perception of Students towards
    - Using the Web-Based Instructional Videos.
    - Using E-Contents for better Understanding of the Content.
    - Activities during Flipped classroom Session Increase Students Understanding of Key Concepts

Hypothesis

There will be no significant mean scores difference between the achievement scores of the experimental groups at pre-test and post-test level (i.e. before and after intervention).

Methodology

As per the nature of study the investigators used experimental method. This is an experimental type of research.

Sample and Sampling Technique

The study was conducted on students of B.Ed. (1st Semester), Department of Education, Tezpur University, Assam. Sample is representative to the population, but in action research is limited to single class. Whole class which constitutes forty-four students was taken for the action research. Purposive Sampling Techniques was undertaken in the present study considering the lack of motivation and unsatisfactory academic achievement among learners as observed by investigators.

Design of the Study

The paradigm of the present study is given in Table 1.

Table-1: Paradigm of the Design of the Study

Purposively Assigned Treatment Groups	Pre-test	Independent Variable	Post-test
Experimental Group	P_1CE	Teaching through Flipped Classroom Technique (FCT)	P_2CE

The details of the abbreviations used in the above table are given below:

FCT – Flipped Classroom Technique

P_1CE- Pre-test (Contemporary Indian Education)

P_2CE- Post-test (Contemporary Indian Education)

Variables of the Study

Flipped Classroom Technique (FCT) was taken as Independent variables. In the

present study, Academic Achievement of the paper Contemporary Indian Education among B.Ed. (1st Semester) students were considered as Dependent Variables.

Tools Used

The study, being an experimental one, necessitated two types of tools as follows:

i. Instructional tool and

ii. Testing tool

The detailed descriptions of such tools are given below:

i. Instructional Tool

The instructional tool was used to impart instruction to the treatment group. The instructional tool used in this present study was Flipped Classroom Technique.

ii. Testing Tool

1. Testing tool is based on selected concepts from CE paper. The selected items were not only convergent in nature but also were seeking divergent answers. The following test was administered.
2. Achievement Test was employed to collect pre and post-test data, to assess the students' achievement in the subject Contemporary Indian Education (CE) which is being taught in 1st semester B.Ed. An extended-response essay test was used having five items. Scoring was done through analytical scoring method by giving suitable weightage to all learning outcomes. Five categories were decided to evaluate the answers; all the elements were given equal importance. A model answer along with a suitable scoring key was provided to all evaluators.
3. Observation was also conducted to gather supporting evidence to students' response. The researchers kept a dairy of observation notes and discussions. After each informal observation the researcher recorded their observation in their dairy.

The perception scale Students' Perception Scale towards Flipped Classroom was constructed following Likert type to study the perception of students regarding Flipped Classroom Technique to teach the subject Contemporary Indian Education. Approriate steps were followed for standardization of the tool. A total of 25 items were prepared initially. However, finally 10 items were retained after consulting experts in the field of tool construction.

Results and Discussions

Objective No. 1

To investigate the overall Effectiveness of Flipped Classroom Technique in Enhancing the Academic Achievement of B.Ed. 1st Semester Students with regard to pre-test and post-test scores.

Table-2: Depicts the Effectiveness of Flipped Classroom Technique in enhancing the overall Academic Achievement of B.Ed. 1st Semester students with regard to mean level pre-test and post-test scores

No. of B.Ed. Students	Test	Mean	SD	't' value
44	Pre-test	12.9	1.32	9.31
44	Post-test	17.1	2.70	

From the above table no. 2, it is observed that the mean score of the pre-test is 12.9 and the standard deviation (SD) of the pre-test score is 1.32. The mean score of post-test is 17.1 and the standard deviation (SD) of the post-test is 2.70. Hence, in the post-test the academic achievement scores of 1st Semester B.Ed. students is increased by 4.2, the 't' value is 9.31 which is significant at 0.05 level which indicates that there is a significant difference between pre-test and post-test score. The academic achievement of B.Ed. 1st semester students is improved significantly after teaching through the Flipped Classroom Technique Intervention Programme. Hence the hypothesis as done previously is rejected.

Discussion of the Result (Objective no. 1)

The above result states that the FCT is more effective in enhancing the overall academic achievement of B.Ed. students. Thus findings from this study shows that active learning strategies through flipped classroom technique increases student academic achievement while promoting important 21st century skills such as collaboration, communication, and critical thinking. The flipped or upturned classroom is a novel and prevalent instructional model, which promotes activities traditionally conducted in the classroom (e.g., content presentation) transfer to home assignments and activities (Bergmann & Sams, 2012; Sohrabi & Iraj, 2016). Since classroom time is not used to transmit knowledge to students by means of lectures, the teacher is able to engage with students by means of other learning activities such as discussion, solving problems proposed by the students, hands-on activities, and guidance.

Result of the present research is also line up with that of prior literature like Sedraz, Erik, Lins, Cavalcanti, and Fernando-da, (2018) showed "flipped learning to be the cause behind increased self-regulation in learning among students". Similarly research conducted by (Jwair, 2018) also expressed that the FCT is dominant to improve students' self-regulation than traditional method. They supported that students' self-regulation gained higher scores after they experienced FCT.

Almost 80 per cent of students reported that their interactions with peers and teachers during class time were more positive in flipped classes than in traditional courses. Unlike traditional teacher-centered instruction, in which students were treated as empty vessels that passively absorb information (Betihavas et al., 2016), flipped classrooms are centered around the students – not the teacher (Bergmann & Sams, 2012). Therefore, many researchers agree that student-centered learning theories (e.g., active learning, collaborative learning) can be more fully utilized in the flipped classroom (Betihavas et al., 2016; Lai & Hwang, 2016; Sohrabi & Iraj, 2016). The very cause of Flipped Classroom Technique is more effective maybe use of video contents in teaching learning process, which was well supported by (Bishop and Verleger, 2013), who stated that to meet the flipped classroom criterion, out-of-class activities must include video lectures. The present study is also very much adeptive in the use of video content by teachers and students. Further according to Smith (2013), it is better to use video lectures, since students prefer streaming content as an out of- class activity. Similarly, Battaglia and Kaya (2015) reported that students mainly focus on videos rather than text readings during out-of-class study. To illustrate the effectiveness of the Flipped Classroom Model, (Janotha, 2016) studied to what extent FCT affected the academic achievement of scholars. The test scores of the experimental group gained from the national standardized test were compared to those of the control group, and it was seen that the

students in the experimental group achieved higher academic performance than the students in the control group (Janotha, 2016). Conversely though, the results of related studies in the relevant literature reflect that the Flipped Classroom Model increases students' academic accomplishment (Janotha, 2016; Pierce & Fox, 2012; Talley & Scherer, 2013; Zengin, 2017).

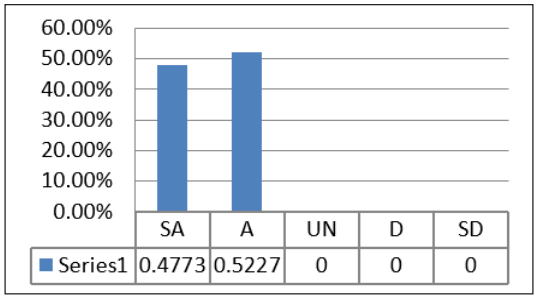
Objective No. 2: To know the Perception of Students towards:

(a) using the Web-Based Instructional Videos

Table- 3: Use of Web-Based Instructional Videos

Strongly Agree (SA)	Agree (A)	Undecided (UN)	Disagree (D)	Strongly Disagree (SD)
21(47.73%)	23(52.27%)	0	0	0

Figure-1: Perception of Students towards using the Web-Based Instructional Video



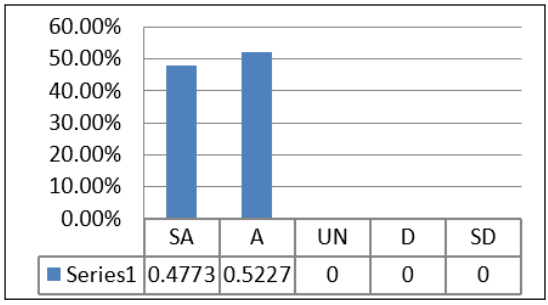
Responding to objective 2a, 21 participants (47.73 per cent participants) out of 44 participants strongly agreed that they learned more from web-based instructional videos using Flipped Classroom Technique. Further 23 participants (52.27 per cent participants) also agreed that they learned more from web-based instructional videos using Flipped Classroom Technique. There were no single respondent in other response categories.

E-Contents Useful to Help Students Better Understand the Content.

Table-4: E-contents useful for better understand the content

SA	A	UN	D	SD
18 (40.91%)	24 (54.54%)	2(4.54%)	0	0

Figure-2: Perception of Students towards E-Contents useful to help Students Better Understand the Content



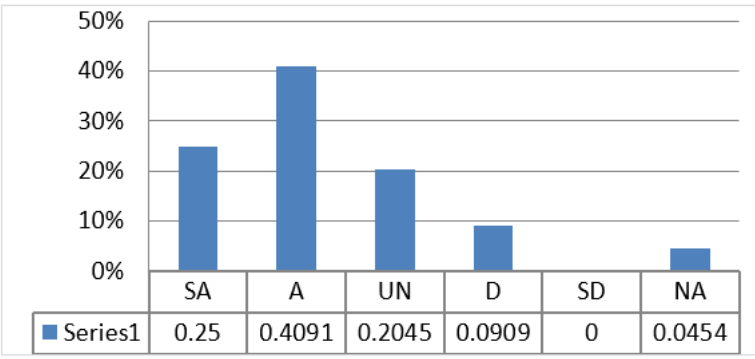
Responding to statement against 2 b, it was found that18 participants (40.91 per cent participants) out of 44 participants strongly agreed that e-contents was useful to help them better understand the content taught through Flipped Classroom Technique. Further 24 participants (54.54 per cent participants) out of 44 participants also agreed that that e-contents was useful to help them better understand the content taught through Flipped Classroom Technique. Under Undecided category there were only 2 (4.54 per cent) responded. Additional there were no single respondent in other two response categories i.e. disagree and strongly disagree.

Activities during Flipped classroom Session Increase Students Understanding of Key Concepts

Table-5: Activities during Flipped classroom Session Increase Students Understanding of Key Concepts

SA	A	UN	D	SD	NA
11(25%)	18(40.91%)	9(20.45%)	4(9.09%)	0	2(4.54%)

Figure-3: Perception of Students towards Activities during Flipped classroom Session Increase Students Understanding of Key Concepts



Above objective 2 c, depicts that 11 participants (25 per cent participants) strongly agreed that flipped classroom session increased their understanding of key concepts in teaching-learning of subject Contemporary Indian Education. It was found that 18 participants (40.91 per cent participants) out of 44 participants also agreed that Flipped classroom session increased their understanding of key concepts in teaching learning of subject Contemporary Indian Education. Under Undecided category there were 9 (20.45 per cent) respondents. And under Disagree category there were 4 participants (9.09 per cent) and under Strongly Disagree there were no responded. In this particular item it was also found that 2 participants (4.54 per cent) student didn't respond.

Discussion of the Result (Objective no. 2)

From the above result it was found that majority of the students liked using the web-based instructional videos as their teaching learning means. Technology and social media work in hand-in-hand in the Flipped Classroom. To create learning materials educators develop video using numerous technologies that is then uploaded to social media sites

such as WhatsApp and YouTube. The use of video to deliver content has become gradually more visible for educators in various courses. Franciszkowics (2008) argues that visual media is critical in courses where there are multiple steps that go into problem solving. Videos can be used to provide scaffolding for students through problems by modelling expert problem-solving strategies (Franciszkowics, 2008).

Again it was found that more than majority of students strongly agreed that the e-contents provided to them were useful to develop their understanding of the content. In subjects like Contemporary Indian Education, where content is structured in an order, it is obligatory that students have a robust comprehension on the pre-requisite skills (Overmyer, 2010). One of Mastery Learning's utmost flaws is that it takes major classroom time to implement (Guskey, 2007). Teachers have conventionally valued the principles of Mastery Learning since its inception in the last 1960's by Benjamin Bloom, but have not ever been practiced effectively. The Flipped Classroom provides learners with proper time to develop improved understanding of the content.

Furthermore, it was also found that the e-contents materials helped students to learn at their own pace. Students also report that in a flipped course they are more likely to engage in collaborative decision making with other students; use class time to engage in critical thinking and problem solving; and have greater opportunity to work at their own pace. In the Flipped Classroom pupils have amplified flexibility to pace the sequencing and delivery of their instructions. Students have the facility to pause, rewind, replay, and even fast forward their video lessons delivered in the course. Copley (2007) found that undergraduate and Master level students often listened to podcasts of discourses they had already attended.

The findings exhibited that majority of the participants responded positively that the flipped classroom supported their learning. Students found that they had further opportunities to communicate with their classmates and teacher, finish their homework in class, and to engage in meaningful classroom events.

Educational Implications

The effect of Flipped Classroom Technique on Academic Achievement is a considerate topic with implications for instructors, students, parents and society, as a whole.

The significant difference between the academic achievement test performances of the students widens the scope of Flipped Learning's effectiveness as applied in institutional settings.

The study draws attention of parents, as almost all the students at School or University level are engrossed with usage of technology even at home also. Devotion of large number of hours with technology can be blended along with academic purposes. Thus especially, parents should be trained to monitor their kids' interaction of multimedia for the academic uses.

The positive result of this study may also help students to engage in collaborative decision making with other students, use class time to engage in critical thinking and problem solving, and have greater opportunity to work at their own pace anytime- anywhere.

Conclusion

The raid growth of technology has sparked a revolution in the world of education, and India is of no exception. (Flumerfelt and Green, 2013) stated that nowadays the use of technology plays an important role in teaching and learning. Similarly in context of present

study research done by (Herreid and Schiller, 2013) showed that flipped classroom is generally seen as capable of improving students' achievement, improve communication and promote teamwork. It is true that the Flipped Learning Model is not the only way to facilitate good teaching. However, effective teaching is better enabled and flourishes more readily in flipped classrooms which support the 21st century education where students are active learner. The Flipped Classroom is a significant shift in the way students traditionally function in a classroom. The general focus of the flipped classroom in this study was to make the learning environment more students centered by moving the learning from a passive format to an active one. Students in a flipped classroom are able to work at their own pace which is great for differentiated learning and engage with their peers in a more interactive, meaningful way when they're in the classroom. This strategy is effective in making teaching and lecturing more exciting and interesting form the one hand, and making the learner positive and responsible for the learning process from the other hand. Flipped instruction produces a learning atmosphere where mastery learning feedback and corrective measures can be used to enhance academic achievement for all students.

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