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Investigating the Effectiveness and Perceived Benefits of the Flipped Classroom Technique: An Action Research Approach

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ABSTRACT

The flipped classroom is now widely acknowledged as a modern teaching model that prioritises student-centred learning, self-directed participation, and improved engagement. This study examined the effectiveness flipped classroom approach in improving academic performance and capturing student perceptions of its pedagogical value among third-semester Integrated B.Sc. B.Ed. Students. Inset of this study, the flipped classroom model was adopted as the principal mode of instruction. Academic achievement was measured in the course Learner and Learning (LL), taken in the 3rd semester of Integrated B.Sc. B.Ed. programme at the Department of Education, Tezpur University, Assam. Data were collected through pre-test and post-test assessments of student performance. The findings demonstrated a statistically significant improvement in achievement, with post-test mean scores markedly exceeding pre-test scores, thereby evidencing the efficacy of the flipped classroom strategy in fostering higher academic attainment. In addition to quantitative gains, qualitative feedback revealed that the majority of participants perceived the flipped classroom approach positively. Students reported that the model enhanced their engagement, improved comprehension, and contributed meaningfully to their overall learning experience. These findings affirm the pedagogical potential of the flipped classroom technique in Teacher Education programmes and underscore its relevance as a learner-centred instructional framework in higher education contexts.

INTRODUCTION

Over the past few years, systematic observation within the Department has indicated that a significant proportion of students demonstrate limited technological proficiency in teaching and learning process. This continuous constraint necessitated the predominant use of lecture-cum-discussion method as the primary instructional approach. However, reliance on this traditional pedagogy yielded unsatisfactory results, classroom participation remained minimal, learner interaction was superficial, and students frequently exhibited passivity during instructional discourse. Their inability to respond adequately in question answer sessions further highlighted the extent of this method in fostering active engagement and critical reflection.

Within the context of Teacher Education, particularly in 4th year Integrated B.Sc.B.Ed. Programme which is a transformative journey whose central objective is to cultivate prospective teachers who possess not only disciplinary knowledge but also pedagogical skills, professional attitudes, and reflective practices. To this prospective teacher through hands-on experiences and community engagement, we transcend traditional education, shaping not only competent educators but forward-thinking leaders. Achieving these outcomes requires pedagogical approaches that are dialogic, interactive, and learner-centred. Traditional lecture-based methods, however, proved insufficient in meeting

these objectives, often resulting in reduced learner motivation, underdeveloped teaching competencies, and unsatisfactory academic performance.

These challenges necessitated the exploration of alternative pedagogical models that could simultaneously integrate technology, foster learner engagement, and improve academic achievement. The Flipped Classroom Technique emerged as an appropriate intervention. By restructuring the conventional instructional sequence where initial content acquisition occurs outside the classroom through digital resources, and in the class, time is dedicated to collaborative problem solving, critical discussion, and application. The Flipped Classroom model promotes active learning, enhances technological adaptability, and facilitates higher-order cognitive development (Ugwuanyi, 2022).

In light of these pedagogical imperatives, the Flipped Classroom Technique was implemented with 3rd semester students of Integrated B.Sc. B.Ed. programme. Its impact was investigated through an action research study entitled: "Investigating the Effectiveness and Perceived Benefits of the Flipped Classroom Technique: An Action Research Approach"

Conceptual and Theoretical Perspectives of the Flipped Classroom

The Flipped Classroom model is grounded in principles

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of active learning and student engagement (Li *et al.*, 2023). In this approach, the classroom functions as a workshop that facilitates interaction between educators and students (Sosa Díaz *et al.*, 2021). This environment promotes both individual inquiry and collaborative learning. Bergmann and Sams (2012) argue that the flipped classroom eliminates the need for prolonged lectures, allowing class time to be dedicated to activities and problem-solving (Tucker, 2012). Bishop and Verleger (2013) suggest that increased communication between teachers and students fosters active learning. Furthermore, Wilson (2013) contends that the flipped classroom enhances students' communication skills and overall performance. Bergmann and Sams (2012) describe the use of video lectures outside the classroom, reserving in-class time for assignments and active learning activities such as problem-based learning. Kim *et al.* (2014) note that flipped classrooms represent a form of blended learning, integrating both online and face-to-face instructional methods. In contrast, Torrisi-Steele and Drew (2013) observe that the online component in blended classrooms typically occurs during class time alongside student-teacher interaction. Bergmann and Sams (2012) further indicate that transformative learning theory and constructivism are relevant theoretical frameworks for understanding the flipped classroom approach. Vygotsky (1978) emphasized that learning is an active process, a perspective that supports the use of the flipped classroom to enhance learners' speaking skills (Ekineh, 2022). This approach also fosters positive relationships between instructors and learners during instructional activities (Ekineh, 2022). Notably, collaboration among learners is a central feature of the flipped classroom model (Karabulut-Ilgu *et al.*, 2018). In the flipped classroom model, students view video lectures prior to class sessions (Rolf *et al.*, 2014). Wu and Chen (2015) and Ibrahim *et al.* (2014) identify key elements of video-based learning, including dual channels, limited cognitive capacity, and active

processing. Wu and Chen (2015) found that voice-over presentations generate the highest cognitive load and sustained attention. Similarly, Pereira *et al.* (2014) report that both lecturers and students prefer creating videos for drama presentations. Siegle (2013) suggests that the flipped classroom approach can facilitate the activation, identification, and application of knowledge, while also fostering positive instructor-learner relationships through collaborative methods.

Objectives of the Study

1. To study the Effectiveness of Flipped Classroom Method in Enhancing the Academic Achievement of Int. B.Sc. B.Ed. 3rd Semester Students.
2. To understand the Perception of Int. B.Sc. B.Ed. third Semester Students towards Flipped Classroom Technique.
3. To know the Perception of Int. B.Sc. B.Ed. 3rd Semester Students towards Flipped Classroom Technique with respect to their Educational Stream (Arts and Science).

Hypotheses of the Study

1. There is no significant difference in the mean scores between the achievement scores of the experimental groups at pre-test and post-test level

MATERIALS AND METHODS

The study employed quasi-experimental design in order to compare the treatment group and control group (Janseen & Kollar, 2021).

Sample

The study involved students of Int. B.Sc. B.Ed. 3rd Semester, Department of Education, Tezpur University, Assam. Overall, thirty nine students were taken for this study.

Design of the Study

The paradigm of the present study is given in Table no.1.

Table 1: Paradigm of the Design of the Study

Purposively Assigned Treatment Groups	Pre-test	Independent Variable	Post-test
Experimental Group	P1CE	Learner and Learning (LL)	P2CE

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

- FCT – Flipped Classroom Technique
- P1 LL- Pre-test (Learner and Learning)
- P2 LL- Post-test (Learner and Learning)

Tools Used

Both instructional and testing tools were utilized in the present study. The treatment group was instructed through the use of an instructional tool. The flipped classroom technique was the teaching method employed in this investigation. The testing tool is based on a few chosen ideas from the paper Learner and Learning (LL). In addition to being convergent, the chosen items also looked for divergent solutions. To evaluate the students' performance in the Learner and Learning (LL) course,

which is taught in the third semester of the academic year, the Achievement Test was one of the tests that were given.

Additionally, observations were made to collect evidence to support the students' responses. The researchers documented their observations and conversations in a diary.

Observation was also conducted to gather supporting evidence for students' responses. The researchers kept a diary of observation notes and discussions. After each

informal observation, the researcher recorded it in their diary.

The Perception scale was constructed following the Likert-type to study the perception of students regarding the flipped classroom technique to teach the subject of contemporary Indian education. A total of 25 items were prepared initially. However, finally 10 items were retained after consulting experts in the field of tool construction.

Delimitations of the Study

i. The present study is limited to the students of Integrated B.Sc. B.Ed. 3rd Semester of Department of Education, Tezpur University, Assam.

ii. The present study is limited to the teaching of Leaner and Learnring (L.L) paper.

RESULTS AND DISCUSSIONS

Objective 1

The first objective aimed to study the overall Effectiveness of Flipped Classroom Technique in Enhancing the Academic Achievement of Integrated B.Sc. B.Ed. 3rd Semester Students with regard to pre-test and post-test scores. The results are shown in the table below;

Table no 2: Shows the Effectiveness of Flipped Classroom Technique in enhancing the Academic Achievement of Integrated B.Sc. B.Ed. 3rd Semester students with regard to mean level pre-test and post-test scores.

Table 2:

No. of Integrated B.Sc. B.Ed. Students	Test	Mean	Standard Deviation	t' value
39	Pre-test	13.9	1.32	8.76
39	Post-test	18.1	2.70	

From this table, it can be seen that the mean score of B.Sc. B.Ed. students in the pre-test was 13.9 with a standard deviation of 1.32, whereas the mean score in the post-test increased to 18.1 with a standard deviation of 2.70. The computed t-value is 8.76, which is greater than the table value at 0.01 level of significance for 38 degrees of freedom.

This reveals that there is a highly significant difference between the pre-test and post-test mean scores of the students. Hence, it is concluded that the intervention was effective in improving the performance of Integrated B.Sc. B.Ed. Students. The academic achievement of Integrated B.Sc. B.Ed. 3rd semester students improved significantly after teaching through the Flipped Classroom Technique Intervention Programme. We therefore fail to reject the null hypothesis.

Discussion of the Result

The Flipped Classroom Technique is more successful in raising Integrated B.Sc. B.Ed students' overall academic achievement, according to the study's findings in terms of their average pre-test and post-test results.

The current study supports that active and student-centered pedagogical strategies foster not only academic achievement but also essential twenty-first-century competencies such as critical thinking, collaboration, and communication. The flipped classroom restructures the traditional instructional sequence by relocating direct content delivery to the home environment, primarily through video-based materials, while reserving classroom time for interactive, problem-solving, and collaborative learning activities (Bergmann & Sams, 2012; Sohrabi & Iraj, 2016). This reorganization enables richer engagement between teachers and learners, while positioning students as active participants in their own learning processes.

The evidence aligns with previous scholarship, which underscores the flipped model's capacity to strengthen

self-regulation and autonomous learning (Sedraz *et al.*, 2018; Jwair, 2018). Research also suggests that such approaches enhance learner responsibility, promote individualized pacing, and encourage peer-assisted interaction (Lai & Hwang, 2016; Betihavas *et al.*, 2016). Moreover, empirical studies consistently highlight the pedagogical benefits of incorporating video lectures, which afford learners flexibility through features such as pausing and replaying (Bishop & Verleger, 2013; Battaglia & Kaya, 2015), and of integrating supplementary readings, formative quizzes, and online exercises to sustain engagement (Gilboy *et al.*, 2015; Galway *et al.*, 2014).

The broader literature further corroborates these findings, demonstrating that flipped learning yields higher levels of academic success across multiple disciplines and educational contexts (Janatha, 2016; Pierce & Fox, 2012; Talley & Scherer, 2013; Zengin, 2017). It is also associated with improved teacher-student interactions, increased student motivation, and more personalized instruction (Driscoll, 2012; Yarbro *et al.*, 2014). Altogether, these findings reinforce the argument that the flipped classroom model advances student learning more effectively than traditional, lecture-centered methods.

Henceforth the present study provides compelling evidence that the Flipped Classroom Technique is a highly effective pedagogical approach for elevating academic achievement among Integrated B.Sc. B.Ed. 3rd semester students. By leveraging technology for content delivery outside the classroom and prioritizing interactive, student-centered activities within the classroom, this instructional model cultivates both improved learning outcomes and the development of essential twenty-first-century skills. The findings corroborate a growing body of research advocating flipped learning as a sustainable, innovative, and transformative instructional paradigm in higher education.

Objective 2

To Know the Perception of Integrated B.Sc. B.Ed. 3rd Semester Students towards Flipped Classroom Technique with respect to:

Inspiring Student to pursue further Learning for the Module

In response to the above question, 10 participants (22 out of 72 participants) strongly agreed that the flipped

Table 3: Perception of students towards flipped classroom session which inspired student to pursue further learning for the module.

SA	A	UN	D	SD
10(22.72%)	19(43.18%)	11(25%)	4(9.09%)	0

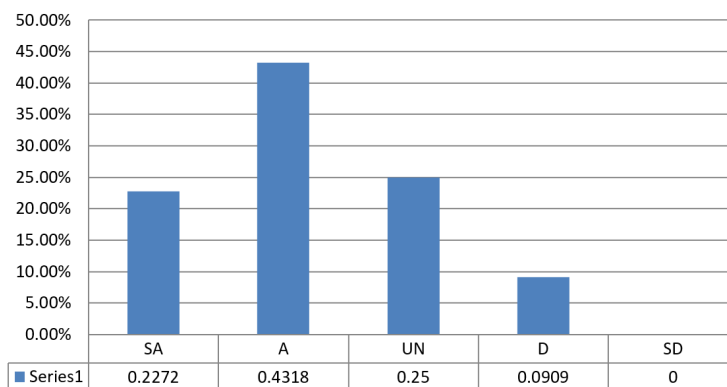


Figure 1: Students’ perceptions of motivating students to continue their education for the module.

classroom session motivated them to continue their education for the module. Once more, it was discovered that 19 participants (43.18 percent) concurred that the flipped classroom session encouraged them to continue their education for the module. Eleven (25 percent) of the respondents fell into the Undecided category.

Additionally, 4 participants (9.09 percent) answered in the Disagree category, while none responded in the Strongly Disagree category.

Instructor was able to Engage in the Flipped Classroom Activity

Table 4: Perception of Students towards Instructor to Engage Students in the Flipped Classroom Activity

SA	A	UN	D	SD
7(15.91%)	23 (52.27%)	11(25%)	3 (6.81%)	0

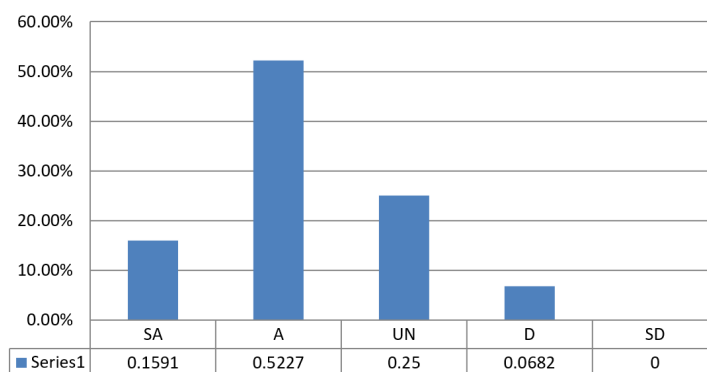


Figure 2: Students’ perceptions of the instructor’s ability to engage them in the Flipped Classroom exercise.

According to the results, 7 participants (15 out of 91 participants) strongly agreed that the instructor was successful in getting you involved in the Flipped Classroom activity. Twenty-three out of forty-four

participants (52 percent) agreed that the instructor was able to get the students involved in the Flipped Classroom activity. Eleven (25 percent) of the respondents fell into the Undecided category. Additionally, 3 participants (6.82

percent) answered in the Disagree category, while none responded in the Strongly Disagree category.

Classroom Technique with respect to their Educational Background (Arts and Science) who are

Objective 3

Inspired to Pursue Further Learning for the Module

To know the perception of students towards Flipped

Table 5: Perception of Students towards FCT to Pursue further Learning for the Module (Arts and Science)

Stream	SA	A	UN	D	SD
Arts	5(22.73%)	10(45.45%)	6(27.27%)	1(4.54%)	0
Science	5(22.73%)	9(40.91%)	5(22.73%)	3(13.64%)	0

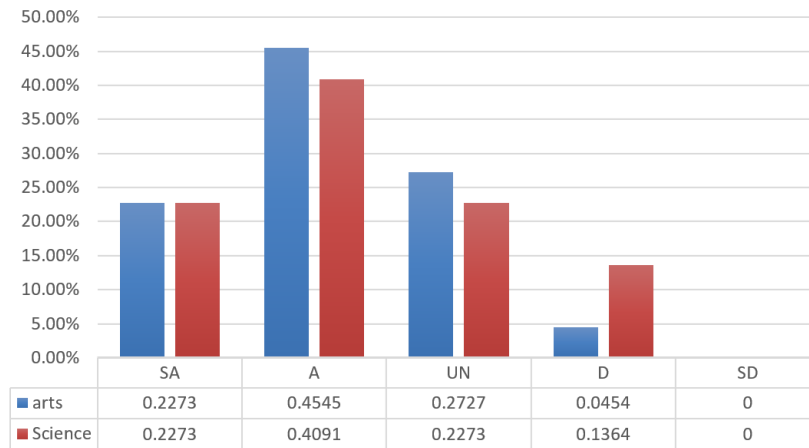


Figure 3: Perception of Students towards FCT inspired students to pursue further learning for the module (Arts and Science)

According to the results, 10 participants (22 and 73 percent of the respondents from the Science and Arts, respectively) strongly agreed that the flipped classroom session encouraged them to work on the module further. Additionally, 19 participants (45–45% from the Arts group and 40–91% from the Science group) concurred that the flipped classroom session encouraged them to continue their education for the module. There were

11 respondents in the Undecided category (27 percent from the Arts group and 22 percent from the Science group). Four participants (4 points 54 percent from the Arts group and 13 points 64 percent from the Science group) answered in the Disagree category, while no one answered in the Strongly Disagree category.

Engaged in the Flipped Classroom Activity

Table 6: Perception of Students towards Instructor in Flipped Classroom Activity (Arts and Science)

Stream	SA	A	UN	D	SD
Arts	4(18.18%)	12(54.54%)	4(18.18%)	2(9.09%)	0
Science	3(13.64%)	11(50%)	7(31.82)	1(4.54%)	0

In response to objective 3b, seven participants strongly agreed that the instructor was able to engage them in the Flipped Classroom activity (18.18 percent from the Arts and 13.64 percent from science). Once more, 23 participants (54 percent from the Arts group and 50 percent from the Science group) concurred that the instructor was successful in getting them involved in the

Flipped Classroom exercise. The Undecided category received support from 11 respondents (18.18 percent from the Arts group and 31.82 percent from the Science group). Additionally, there were three respondents (9 points from the Arts and 4 points from science) in the Disagree category, while no one responded for this specific item under the Strongly Disagree category.

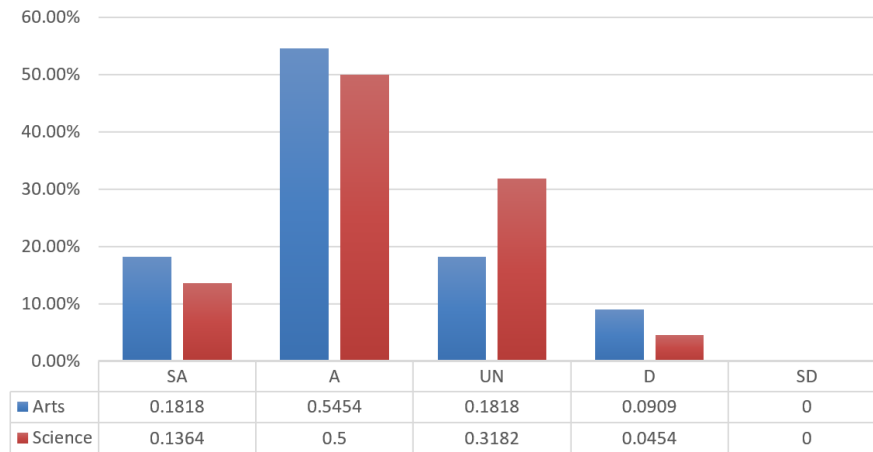


Figure 4: Perception of Students towards Instructor in the Flipped Classroom Activity (Arts and Science)

Discussion of the Results

The analysis indicates that the majority of students, regardless of disciplinary background, demonstrated a marked preference for web-based instructional videos as a medium of instruction. Within the Flipped Classroom paradigm, technology and social media function symbiotically, instructors generate digital learning resources, often in video format, and distribute them through widely accessible platforms such as YouTube and WhatsApp. The pedagogical value of such media has been well-documented, particularly in contexts where problem-solving requires the mastery of sequential processes. Franciszkowics (2008) set that visual media can effectively model expert strategies, thereby scaffolding learners’ progression through complex tasks.

The integration of digital media within the Flipped Classroom further broadens the instructional assemblage available to educators. The proliferation of online learning environments underscores a transformative potential to design learning experiences that sustain engagement and improve retention. Empirical evidence suggests that, when strategically employed, technology not only enhances student participation but also contributes to lower attrition, stronger academic outcomes, and heightened learner satisfaction (Revere & Koach, 2011). Students reported that e-content contributed meaningfully to their cognitive engagement, with particular emphasis on deepening conceptual clarity. This is especially pertinent in hierarchically sequenced disciplines like Learner and Learning, where prerequisite competencies serve as a necessary scaffold for higher-order learning, the acquisition of prerequisite knowledge is indispensable for subsequent learning (Overmyer, 2010). Traditional Mastery Learning, though conceptually robust, has historically been constrained by the extensive instructional time it demands (Guskey, 2007). The Flipped Classroom provides a pragmatic solution by redistributing instructional activities, thereby enabling students to consolidate foundational concepts outside class while preserving in-class time for higher-order engagement.

Beyond cognitive outcomes, the affective dimension of learning was also positively influenced. Students reported that e-content not only facilitated understanding but also rendered the teaching–learning process more enjoyable. A recurring theme in the data was an appreciation for the flexibility afforded by the model, which enabled more frequent teacher–student interaction and expanded opportunities for active learning within class. This aligns with contemporary pedagogical scholarship emphasizing that engagement and communication are critical mediators of learning outcomes.

Another salient finding concerned the affordances of self-paced learning. Students consistently highlighted the value of being able to regulate the pace, sequencing, and frequency of their engagement with e-content. Features such as pausing, replaying, or fast-forwarding were seen as instrumental in supporting individualized learning trajectories. These results resonate with Copley’s (2007) observation that students leverage recorded lectures not only for revision and assessment preparation but also for compensating missed instructional opportunities. Similarly, Yee and Hargis (2009) argue that the asynchronous availability of learning materials aligns with students’ diverse schedules and lifestyles, thereby strengthening the accessibility of instruction.

Collectively, the findings affirm that the Flipped Classroom fosters an enriched learning ecology, characterized by increased interaction, enhanced opportunities for collaborative and critical inquiry, and greater learner autonomy. By shifting content acquisition to out-of-class contexts, instructional time is repurposed for deeper engagement, thereby bridging cognitive, social, and affective dimensions of learning.

CONCLUSION

The rapid expansion of technology has redefined educational practices globally, with India reflecting similar trends. Technology is increasingly recognized as integral to contemporary pedagogy (Flumerfelt & Green, 2013), and the Flipped Classroom has emerged as a promising model in this context. Research by Herreid and Schiller

(2013) demonstrates that the approach enhances academic achievement, strengthens communication, and promotes collaborative learning. By shifting direct instruction to pre-class digital formats, typically through video lectures, classroom time is freed for higher-order learning activities such as application, problem-solving, and peer interaction.

This restructuring aligns with constructivist principles by positioning students as active participants in their learning while enabling differentiated, self-paced engagement with content. The teacher's role correspondingly evolves from that of lecturer to facilitator, offering individualized guidance and formative feedback. Such practices resonate with Bloom's (1984) model of mastery learning, which emphasizes corrective feedback and equitable opportunities for achievement. Overall, the Flipped Classroom represents a pedagogical shift toward student-centered, technology-enabled learning atmospheres that are responsive to the demands of 21st-century education.

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