



EXPLORING THE OUTCOME OF FLIPPED CLASSROOM MODEL ON STUDENT SELF-EFFICACY

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RESEARCH ARTICLE



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Abstract

With the goal of making higher education more adaptable, interactive, and student-centered, there has been an effort to make it more flexible. The limits of traditional models of instruction are going to be reduced as a goal. A new method that has been developed to engage kids is called the flipped classroom paradigm. On the other hand, the study concerning the consequences of flipped classrooms in the teaching-learning process is still in its infant developmental stages. This study examined students' efficacy in a flipped classroom model. The survey was consummated on first year B.Ed. students. The researchers developed a questionnaire to measure students' (n = 40) efficacy level in a flipped classroom. The researchers used video clippings as learning tools, and LMS (Learning Management System) as the supporting tool within the frame of a flipped classroom model. The results unveiled that the majority of the students had a positive attitude towards flipped classroom, the use of video and LMS, and that positive attitude towards flipped classroom was strongly correlated to the efficacy level of the students. It was found that flipped classroom model helped to increase motivation, and engage the students more within classroom activities. The researchers also noticed that the low achiever students also significantly reported with more positive attitude as compared to their attitude in a traditional classroom.

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Introduction

Considering the current state of technology, it is now an imperative necessity for educational institutions to incorporate technology into their curriculum. With the use of technology, educators are now able to accommodate students who have a wide variety of learning styles by developing classes that are interactive, individualized, and engaging for their pupils. The availability of high-quality teaching resources, up-to-the-minute news, and virtual field trips is increased as a result of the elimination of obstacles that are based on geography and socioeconomic status. The usage of technology can have a positive impact on a student's preparedness for the digital industry. Technology also helps students improve their communication skills, critical thinking abilities, and ability to work together. In addition, the use of digital technologies makes administration easier, speeds up testing, and reveals vital information about the growth of children. The implementation of technology in educational settings provides a number of advantages, including the enhancement of student engagement, the enhancement of learning outcomes, and the preparation of the next generation to flourish in a society that is already technologically advanced. In order to foster a love of learning, critical thinking, and creativity among today's kids, it is vital for teachers to incorporate technology into the classroom in an efficient manner.

Modern Classroom

In today's fast-paced and technology-driven world, it is absolutely necessary to have modern classrooms. These classrooms offer a learning environment that is collaborative, interactive, and student-centered, which in turn encourages academic excellence, creativity, and innovation. It is possible for teachers to offer teaching in a manner that is more engaging, effective, and personalized in today's classrooms that are equipped with digital resources such as smartboards, laptops, and tablets. These classrooms also encourage student autonomy, critical thinking, and problem-solving skills. Furthermore, contemporary classrooms make it possible to integrate emerging technologies like artificial intelligence, virtual reality, and gamification in a

seamless manner. These technologies have the potential to improve student motivation, participation, and overall learning outcomes, ultimately preparing students for success in a world that is becoming increasingly complex and interconnected.

About flipped classroom: The flipped classroom, enhanced by advanced technology, transforms conventional education. Students utilize interactive pre-recorded video lectures, online simulations, and digital content at home, employing devices such as tablets and computers. Classroom time evolves into collaborative, practical sessions, employing contemporary tools such as interactive whiteboards, virtual reality headsets, and 3D printers. Educators conduct group discussions, project-oriented learning, and immediate evaluations utilizing resources such as learning management systems, educational applications, and student response systems. Sophisticated audio-visual apparatus, comprising intelligent projectors and audio systems, augment multimedia presentations. Moreover, students employ mobile devices to access online resources, engage in polls, and provide feedback via digital platforms, cultivating a dynamic, student-centered environment that enhances active learning, creativity, and individualized education.

Self-Efficacy: Self-efficacy refers to an individual's belief in his or her capacity to execute behaviors necessary to produce specific performance attainments (Bandura, 1977, 1986, 1997). Self-efficacy reflects confidence in the ability to exert control over one's own motivation, behavior, and social environment. These cognitive self-evaluations influence all manner of human experience, including the goals for which people strive, the amount of energy expended toward goal achievement, and likelihood of attaining particular levels of behavioral performance. Unlike traditional psychological constructs, self-efficacy beliefs are hypothesized to vary depending on the domain of functioning and circumstances surrounding the occurrence of behavior. Self-efficacy is comprised of several essential elements, the most important of which are self-perception, self-confidence, goal-setting, and resilience. At the same time as self-perception refers to beliefs about one's talents and qualities, confidence is the belief that an individual has in their own abilities to carry out activities. Individuals are able to make objectives that are both reasonable and attainable through the process of goal-setting, which also helps to break down more difficult activities into more manageable pieces. Individuals who possess resilience are able to adapt to adversities and preserve their enthusiasm to achieve their goals, despite the fact that they are confronted with barriers and setbacks.

Self-efficacy is essential for students, significantly influencing their academic success, emotional well-being, and future pursuits. Students exhibiting high self-efficacy tend to confront challenges with confidence, persistence, and resilience, which correlates with enhanced academic performance and achievement. They are more adept at managing stress, anxiety, and setbacks, which are inherent in academic endeavours. Furthermore, self-efficacy promotes a growth mindset, allowing students to perceive failures and mistakes as opportunities for development and learning. This fosters intrinsic motivation, creativity, and innovation, which are essential skills for success in the 21st century. Moreover, self-efficacy improves students' capacity to establish achievable goals, prioritize tasks, and manage time efficiently, resulting in enhanced organization and self-regulation. Enhancing self-efficacy enables educators and parents to empower students in taking ownership of their learning, fostering a positive self-image, and realizing their full potential, which contributes to a more fulfilling and successful academic and professional trajectory.

Review of related literature

The purpose of the research study titled "The Effectiveness of the Flipped Classroom on Students' Learning Achievement and Learning Motivation: A Meta-Analysis" was to conduct an evaluation of the overall effectiveness of the flipped classroom style of instruction on the academic performance and motivation of students. In order to collect information, the researchers consulted three different databases: Eric, Scopus, and Web of Science. Within the scope of this meta-analysis, the findings of 95 studies that were conducted with 15,386 participants and published between 2013 and 2019 were examined. The results of the study suggested that the flipped classroom methodology had a moderate effect size on both the level of learning achievement and the level of motivation, respectively. The effect sizes of twelve different moderators were analyzed. These moderators included the following: sample level, sample size, learning domain, flipped classroom model, research methodology, intervention duration, teaching technique, sample area, interactions in pre-class and face-to-face settings, pre-class tools, and pre-class resources. The results showed that the effect sizes were significantly impacted by factors such as the size of the sample, the length of time interventions were carried out, and the geographical locations. The outcomes of this study are analyzed in great detail, and their implications for the implementation of the flipped classroom concept are also discussed.

The purpose of the research study titled "Flipped Classroom in the Educational System: Trend or Effective Pedagogical Model Compared to Other Methodologies?" was to investigate the efficacy of the flipped classroom methodology in comparison to other approaches. After doing a thorough analysis, the pre-post and control group trials were confirmed to be legitimate. The Flipped Classroom method was found to be more effective in enhancing learning achievement in secondary and higher education, as well as other dimensions such as motivation, self-efficacy, cooperativeness, and engagement, according to a study that analyzed 61 studies with a total of 5541 students from 18 different databases. It has been discovered that the Flipped Classroom approach is equally useful in enhancing academic success as well as other variables such as self-concept and social climate among elementary school students. These differences were 1.36 to 1.80 times bigger between the Flipped Classroom group and the control group, depending on the educational stage of the students. On the basis of these findings, the report proposed that the Flipped Classroom approach might be superior to the conventional approaches utilized in higher education. It is possible that it will not be as effective in educational phases such as primary school, which are not often covered by the use of traditional methods.

The purpose of the study paper titled "Investigating Strategies for Pre-Class Content Learning in a Flipped Classroom" was to investigate the effectiveness of three distinct pre-class learning approaches in the context of basic biology classes at a public and private establishment of higher education. Readings in the form of textbooks, video lectures, and interactive online tutorials were some of the modes of instruction that were utilized. Despite initial discrepancies in their capacity to learn through pre-class activities, students at both institutions were able to achieve equivalent learning gains by the time the final evaluation was administered thanks to a student-centered flipped classroom technique. In terms of total student learning, video lectures were found to have a little advantage; however, the flipped classroom approach was found to be beneficial in assisting students in achieving equivalent learning gains at the final evaluation.

In the study "Redesigning flipped classrooms: a learning model and its effects on student perceptions", a flipped classroom is redesigned using four integrated practices: collaborative projects, autonomous practices, in-person counselling from the teacher, and fast response questions. Maximizing student achievement promotion in flipped classes is the aim of this redesign. In China, where students are frequently hesitant to engage in active learning in the classroom, the concept is tested in two introductory undergraduate computer science courses. A questionnaire with a sample size of 66 and interviews with a sample size of 200 provide the model's data. Most students thought the new model was more student-centered than the old one, according to data from a bipolar scale. The benefits offered by each learning dimension were thoroughly examined in this study using a learning capability matrix. The interviews included a thorough discussion of the students' favorable perceptions of the model as well as one area of concern that was raised.

According to the findings of a study "Flipped classroom experiences: student preferences and flip strategy in a higher education context", that involved 563 students in higher education and ten course convenors, students have diverse preferences for the aspects of flipped classrooms. The students were divided into two categories: "Flip endorsers" and "Flip resisters." Those who supported Flip shown greater positive attitudes and engagement, whereas those who did not support Flip were either neutral or resistant to the pre-learning parts. According to the findings of the study, flipped classrooms have the potential to enhance student results and participation when course convenors employ a theoretical perspective, incorporate assessment, and adopt a thorough flipped strategy.

Based on the literature review that was presented earlier, the researchers have developed the following research questions in order to conduct an analysis of the issue.

Research Questions

1. Does the flipped classroom technique provide confidence among the students?
2. Is there any difference between the outcome of a flipped classroom and a traditional classroom?
3. Is there any positive outcome if the students get study material prior to the class?
4. Is there any positive outcome if study materials are available at Learning Management System and students can learn at their own?
5. Are video materials and video contents more effective than one way lecture?
6. Does the confidence of having idea about classroom discussion topic boost the self-efficacy levels of the students?

Hypothesis

H0₁: There does not exist any significant difference in the outcome of a flipped classroom and a traditional Classroom.

H0₂: There does not exist any significant difference in the self-efficacy level of the students in a flipped classroom and traditional classroom set-up.

Methodology

The researchers used a flipped classroom to teach the trainee teachers of School of Education, Adamas University. Availability of study materials prior to the class may overcome the basic constraints associated with regular teaching-learning process. In particular case, sufficient number of books are not always available at university central library. The researchers divided the students among two groups, one is control group and the other section is treatment group. They used purposive sampling technique for selecting students for each group, without hampering regular class structure. The researchers sent video clippings containing the related information and upload these clippings of each topic in the university Learning Management System prior to the class. The researchers also e-mailed the materials at least one day before the class. They practiced this process for the treatment group of Semester II students. For the other group of Semester II students, i.e. for the control group, they used traditional teaching- learning strategies, like one-way lecture and a few related question-answer discussion. No flipped material was given in the traditional classroom set up. But the students had the freedom to raise any question or to ask for clarification. The researchers followed this system for one months, nearly for 8 classes. At the end of this experiment, written and oral tests were taken on the subject matter. Along with this, the researchers developed a questionnaire, with 15 questions. Each question was related to flipped classroom, its advantages, limitations and out -comes. The reliability of the questionnaire is 0.91 (Cronbach's Alpha).

In the written test, 50 objective type questions, each carrying 2 marks, were given to both groups, completely developed on the subject matter taught in the classes. For the correct answer maximum credit point was 2 and for wrong answer it was 0.

Analysis

H0₁: There does not exist any significant difference in the outcome of a flipped classroom and a traditional Classroom.

Table 1.1: Difference between the mean of the score achieved by treatment group and control group.

Variations	Sub sample	Sample size	Mean	SD	SED	t	remarks
Mode of teaching-learning Process	Treatment group (Part of flipped classroom set up)	20	21	2.81	0.79	3.48	significant
	Control group (Part of traditional one-way lecture method)	20	18.25	2.15			

After the test, the researchers checked the copies and it was shown that the mean of the treatment group was 21 and that of control group was 18.25. On perusal of the table 1.1, it was observed that the value of ‘t ratio’ 3.48 is higher than the table value at 0.05 level (2.086) and 0.01 (2.845). Thus, the null hypothesis “There does not exist any significant difference in the outcome of a flipped classroom and a traditional classroom” was rejected.

Interpretation: The result of the table 1.1 indicates that there is significant difference in the outcome of a flipped classroom with that of traditional classroom. The mean (21) of the scores secured by the students after getting lesson in a flipped set up, was higher than that of traditional classroom (18.25). So, the outcome of the flipped set up was good than that of a traditional set up.

H0₂: There does not exist any significant difference in the self-efficacy level of the students in a flipped classroom and traditional classroom set-up.

Table 1.2: Difference between the mean of the scores achieved by treatment group and control group.

Variations	Sub-sample	Sample size	Mean	SD	SED	t value	remarks
Mode of teaching-learning strategy in classroom	Treatment group (Part of flipped classroom set-up)	20	51	5.72	1.78	2.12	Significant
	Control group (Part of traditional one-way lecture method)	20	47.23	5.51			

On perusal of the table 1.2, it was observed that the value of ‘t ratio’ 2.12 is higher than the table value at 0.05 level (2.086). Thus, the null hypothesis “There does not exist any significant difference in the self-efficacy level of the students in a flipped classroom and traditional classroom set-up” was rejected at 0.05 level.

Interpretation: The result of the table 1.2 indicates that there is significant difference in the self-efficacy level of the students from a flipped classroom with that of traditional classroom. The mean (51) of the scores secured by the students after getting lesson in a flipped set up in self-efficacy scale, was higher than that of traditional classroom (47.23). So, the self-efficacy level of the students who are getting lessons in a flipped set up was higher than that of a traditional set up.

Conclusion

Following the completion of the testing, the researchers have determined that there is a substantial disparity between the outcomes of traditional teaching approaches and those of flipped classroom models. Higher levels of topic mastery, deeper conceptual comprehension, and greater problem-solving ability were evidenced by students in classrooms that were flipped. It was found that students gained stronger critical thinking abilities and greater topic retention when they engaged with lecture materials independently before class and used classroom time for active application with teacher assistance. This was revealed by the statistics. In addition, the flipped model led to more individualized learning experiences since teachers were able to devote more time to addressing the specific requirements of each student during the course of the class sessions. These pedagogical approaches not only enhanced academic performance metrics, but they also generated higher student involvement, cooperation, and ownership of the learning process. These are essential aspects that contributed to the measurable superior educational results that were observed in environments that utilized flipped classrooms.

Annexure: Table 1.3:

Serial Number	Question	Answer				
		SD	D	N	A	SA
1.	Technology helps me to learn many new things.					
2.	I don't feel using technology in learning is necessary.					
3.	I believe that students can improve their understanding and learning skills using technology.					
4.	I believe ICT enabled classroom can help students to understand the subject in a very good way.					
5.	I think traditional lecture and classroom discussions are enough in school curriculum transaction.					
6.	I believe video clippings can help the students to visualize the content matter.					
7.	I believe traditional classroom discussions can enhance the communication skills of the students.					
8.	I think flipped classroom technique can help to increase academic achievement.					
9.	Flipped classroom promotes the development of communication skills.					
10.	ICT enabled classroom gives teachers the opportunity to be learning facilitators instead of information providers.					
11.	Traditional classroom can enhance students' holistic development better than ICT enabled classroom.					
12.	ICT enabled classroom helps to accommodate students' personal learning styles.					
13.	Flipped materials help the students to join class with basic knowledge on subject matter.					
14.	Flipped learning motivates and allows the students in active participation in the teaching-learning process.					
15.	Flipped strategy makes the students confident during teaching-learning process.					

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