Research Article

A conscientious literature review of Flipped learning strategy as a means of enhancing student engagement

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Abstract

Researchers and educators have often searched for alternative strategies and methods to teach students according to the needs of the 21st century. Developing higher-order skills among learners has become the need of the hour and new pedagogical approaches are required for the same. Among such approaches, the inverted classroom strategy, popularly known as the "Flipped classroom" is one such innovative pedagogical strategy where learning is student-centered. Under this inductive approach, classroom instruction is done at home with the help of videos and interactive lessons, and work done outside the class is now done in class with the teacher as a guide. Since flipped classroom aims at providing higher-order skills to students which is possible when students engage in activities that include interaction between students and staff and between students - thus related to the concept of student engagement. Student's participation in active learning and conditions favorable for higher-order skills is recognized as student engagement by Coates (2008).

In order to gain a deeper understanding of how flipped classroom learning strategy affects students, a need was felt to review different studies and steer through comprehensive quantitative and qualitative data.

Keywords: Flipped classroom approach, innovative pedagogical strategy, student engagement, higher-order skills, active learning.

Introduction

"We need technology in every classroom and every student and teacher's hand, because it is the pen and paper of our time, and it is the lens through which we experience much of our world."

- David Warlick (2015)

For ages, our education system has been based on the central pillar of the traditional teacher-centred approach to learning. The entire focus is on establishing the expertise of teachers in embedding the essential pedagogical skills and methods. This historical lecture method is being questioned nowadays by educationists because they are of the opinion that through this, the students are less attentive, mere passive learners and moreover, the courses are not delivered according to the individual learning needs. Also, it becomes difficult to teach higher-order thinking skills such as application and analysis using this age-old practice. Students often cram up before exams which results in attaining just the superficial knowledge rather than understanding the grass-root level.

Recent educationists have advocated a change in the teaching-learning process using technology to provide active

learning and holistic engagement, which is the essence of the constructivism theory of learning. This has led to a push to discover new student-centred teaching and learning methods where the teachers and students have new roles. Flipped learning strategy is one of such methods which provides an active learning environment for both the teachers and the learners (Sharma & Chowdhry, 2021). This technological strategy includes a large variety of activities both inside and outside the class, also may embrace a wide range of approaches, such as debates, discussions, quizzes, and presentations. The flipped classroom model seems to cater to the challenges faced by the traditional learning methods and does the groundwork for using classroom time for engaging in higher levels of skills as mentioned in Bloom's taxonomy.

Flipped learning-an active learning strategy, tends to engage and encourage students to enhance their knowledge and advance their skills (Prince, 2004). Student engagement has often been associated with improving the learning environment as it enables the students to actively participate in classroom activities. It broadly refers to student's engagement in various inside and outside classroom activities that contribute to their learning achievements and their sense of belonging in the academic community. Here Flipped classroom strategy plays a significant role. Keeping this in view, it becomes invariably essential to study the effects of the flipped learning strategy on student engagement and how it helps the learner develop higher-order thinking skills.

Outlining the Flipped Learning Strategy

The flipped learning strategy is often referred to as a type of blended learning which makes use of both the traditional and modern technological aspects of education. In this type of strategy, the students have to watch videos or listen to audio lessons at home and then have to respond actively to the discussions, quizzes, and brainstorming sessions in the class (Sharma & Chowdhry, 2018). Munir, Baroutian, Young, and Carter (2018) state that "Students can watch from mobile devices at any time and come back to class with questions for the teacher, so they have more flexibility and the opportunity to learn independently. Keeping up with the class is no longer an issue for students who process ideas slowly while faster-thinking students can avoid boredom". A flipped classroom enables students to be pre-prepared for the class by already going through the topic before class and then utilizing the face-to-face interaction time in the class for discussions, problem-solving, application, and analysis of the content learned. Here, the students can start doing the exercises as soon as the class starts, and the lecturer supervises their progress and addresses their queries. As a result, students get more engaged and are less likely to give up due to frustration.

Outlining Student Engagement

Student engagement is the extent of engrossment, eagerness, certainty, interest, and devotion that students exhibit in the process of teaching and learning. Kuh, Kinzie, Buckley, Bridges & Hayek (2007) defined engagement as a form of partaking in educationally effective practices to result in several assessable outcomes. Student engagement is primarily associated with the student's interest, attention, and zeal during the learning process. They are highly motivated to learn when they are curious, interested, and engrossed in the learning process.

According to Blumenfeld, Phyllis & Paris,

Alison. (2004), "Student engagement is a multidimensional (multifaceted) construct that can be measured with all the dimensions dynamically interrelated. Its major three dimensions are:

- Behavioral engagement refers to students' participation in class, such as their attendance and concentration levels, along with their participation in social aspects of learning and whether or not they participate in extracurricular activities, all fall under the category of behavioural engagement.
- Emotional engagement refers to the feelings that students have, particularly in relation to the topic or class that they are currently enrolled in, their instructor, their classmates, and their entire academic experience.
- Cognitive engagement refers to the enthusiasm and effort that students put into their own education. It also includes how much they take responsibility for their own learning, how well they can regulate themselves, and how much effort they exert to reach their own educational goals.

The involvement of educational technology has established a favorable environment for the students to learn and attain higher-level skills, thus giving them more opportunities to engage themselves in other learning processes. Various studies like Danuri, Dwee, Jamari, and Samad (2017) and Gilboy, Heinerichs, and Pazzaglia (2014) have advocated that teachers must apply flipped learning strategies to enhance student engagement in the learning process.

Engaging in the flipped classroom

The flipped classroom strategy makes use of an active learning and problem-solving approach where the learners familiarise themselves with the course being taught beforehand to facilitate discussions in the classroom. Mason, Rutar, Teodora, and Cook (2013) in their studies found flipped classrooms an effective approach and performed better in their academics. Studies have shown that a positive and supportive relationship with the lecturers can lead to better behavioral, emotional, and cognitive engagement. White et al. (2017) have also suggested a preference for flipped classroom instruction in their studies. Students have shown a synergistic relationship between preparation for class and in-class learning, which is visible in the higher results after student assessment. Flipped classroom learning connects both the previous and current learning experiences and keeps students mentally engaged in the topics. This is an essential element of student engagement that the flipped classroom strategy depicts. The flipped classroom proved a boon in the current pandemic situation. Therefore, it becomes essential to study further its effect and relationship with various aspects of education. Keeping all this in mind and to gain insight into the impact of flipped classroom strategy on multiple dimensions, the related studies were surveyed to analyse the relationship between student engagement and flipped classroom instruction. The variables of research are Flipped classroom instruction and student engagement.

Rationale of the study

In the midst of a pandemic, the flipped classroom proved invaluable. As a result, it is critical to better investigate its impact and link with many components of schooling. With this in

mind, and in order to obtain insight into the influence of the flipped classroom method on several dimensions, various associated research were surveyed in order to examine the relationship between student engagement and flipped classroom instruction. Students in a flipped classroom have more opportunities to interact with course materials outside of class, which improves their active learning and, in turn, their ability to retain and apply what they've learned. By analyzing the impact of this approach on student engagement, teachers can better cater their lessons to students' unique requirements and interests, ultimately improving the quality of their students' educational experiences. Educators can create a stimulating and interactive classroom where students can think critically and have a deeper understanding of the material if they have a firm grasp of the effect this method has on student engagement. By analyzing the impact of the flipped classroom strategy, educators can evaluate its efficacy and make the necessary adjustments to improve student engagement and learning outcomes. This assessment will facilitate the continuous development of instructional practices, ensuring that students receive the most effective and engaging learning opportunities possible.

Objectives of the study

- To assess whether the flipped classroom approach enhances students' intrinsic motivation to learn and participate actively in the learning process thereby leading to improved student engagement in the class.
- To determine if the flipped classroom strategy leads to improved academic performance in terms of grades, test scores, or mastery of key concepts.
- To determine if the flipped classroom method promotes increased student collaboration, peer-to-peer interaction, and cooperative learning experiences.
- To identify whether the flipped classroom approach increases students' active engagement in class discussions, group activities, and other interactive learning experiences.
- To analyse whether the flipped classroom method enhances students' ability to take responsibility for their own learning, self-regulate their study habits, and develop lifelong learning skills.
- To examine the effectiveness of the flipped classroom strategy in promoting critical thinking and problem-solving skills among students.

Review of related literature

The research done in the past 17 years (2023-2007) was collected in order to survey the literature on the variables i.e. Flipped Classroom Learning Strategy, Student Engagement. For this study, the researcher gathered related study reports, various periodicals, published reviews and research abstracts. The researcher mainly focused on the studies that established a relationship or analysed the effect of the Flipped learning strategy on student engagement and academic achievement. Obtaining pertinent data, categorising, and evaluating it took a lot of time. An extensive review of the Flipped learning strategy was done in order to gain more insight into the topic. Some of the shortlisted comprehensive reviews have been discussed here for reference. The following inclusion criteria were applied during the study's selection process:

- Research published in academic journals.
- Academic research (in schools, colleges, and universities).
- Studies examining the influence of Flipped classroom strategy on student performance.
- Studies with measurable outcomes of student performance (e.g., academic achievement, test scores, grades).
- Scholarly works that are published in English.

Naik (2023) assessed the effectiveness of the flipped classroom strategy on student performance. This literature research suggested that the flipped classroom approach improves student achievement. The flipped classroom paradigm improves students' academic achievement, involvement, critical thinking, and retention. Moreover, it also encourages active involvement, collaboration, and self-guided learning, which improves subject understanding. The study also suggested that the flipped classroom model has the potential to improve educational equity, foster a more welcoming learning environment, and better equip students for the challenges of the modern workplace.

The effectiveness of the Flipped classroom strategy in improving the student's learning outcomes was assessed by Paramita (2023). The main aim was to determine whether the Flipped Classroom learning method was able to effectively improve student learning outcomes, especially in English lectures. The research was quantitative descriptive research with a quasi-experimental design. There was a significant difference in the average mean gain scores of the control and experimental groups showing the positive effectiveness of the Flipped classroom strategy in improving the English skills of students.

Sarker, Pramath; Siddique, Md; Sultana, Sabina; and Pal, Subrata. (2023) conducted a study to examine the impact of the reversed classroom learning environment on student engagement and satisfaction relative to the traditional classroom. Using a 5-point Likert-scale questionnaire, a cross-sectional study was conducted to measure student engagement and satisfaction with both the traditional classroom and the reversed classroom. Data were received from 79 participants in the traditional classroom and 61 participants in the flipped classroom. The study revealed a significant difference between traditional and flexible classrooms in terms of student engagement and satisfaction. Students were more engaged and satisfied with flipped classrooms than with traditional classrooms, according to the results.

In a quasi-equivalent, non-randomized factorial design, Nja and Anari (2022) assessed flipped classroom students' chemistry and academic performance attitudes. The study of 100 students employed a 30-item chemistry attitude questionnaire. Pretests were given to controls and experiments. The control group was taught traditionally, whereas the experimental group was flipped. Experimental group students took a post-attitude test. The post-attitude score was much higher than the pre-attitude score. Academically, students outperformed the average. These findings imply that flipping the classroom may improve students' chemistry attitudes and performance. The Flipped classroom strategy enabled students to review lecture videos at home in order to fully comprehend the material.

Rehman (2022) conducted a pilot study

at a local secondary school to determine the efficacy of digital literacy in terms of Flipped classroom instruction. A seventh-grade science class was inadvertently flipped and compared to a traditional classroom setting to evaluate the student's academic achievement. The study population consists of all 259 male and female pupils in seventh grade during the first semester of the 2019-2020 academic year. The results indicated that there is a statistically significant difference between the achievement scores of students in the Flipped classroom and those of students in the traditional classroom. Students in flipped classrooms performed better than those in traditional classrooms. In a Flipped classroom environment, student responses to a Likert scale survey revealed increased engagement, interaction, and depth of learning.

The impacts of the flipped classroom on 4th-grade students' academic progress and motivation were examined by Erbil and Kocabas (2020). To conduct the study, they used three experimental groups and one control group. They look at the results of using both flipped classrooms and cooperative learning at the same time and separately. The experimental method of research was adopted by forming four groups- three experimental and one control group. The findings of the study revealed that the flipped classroom approach, collaborative learning method, and both methods together have a positive impact on students' academic performance.

Hakimzade (2020) carried out a study to see the effect of the flipped classroom method on student engagement and academic performance of high school students. Traditional lectures and flipped classroom training were used to teach 56 randomly selected students for experimental research for a period of 20 weeks. The results of the experiment show that the experimental group's academic performance improved significantly, and student involvement across all four dimensions, i.e., behavioural, cognitive, emotional, and factor engagement, was higher than average, demonstrating the beneficial effects of flipped classroom education.

Stratton, Chitiyo, Mathende, and Davis (2020) compared flipped classrooms versus one-to-one classrooms in middle school scientific accomplishment and student perspective. During the study, 7th-grade students' academic performance and attitudes toward flipped classrooms were evaluated. Eighty-one students were taught in the traditional manner, while the remaining 73 were taught using a flipped learning model. In terms of academics, there wasn't much difference between the two groups. A surge in student engagement and motivation in the flipped classroom was observed.

Alamri's (2019) carried out research on students' academic success, performance, and satisfaction in a flipped classroom environment. Mixed-method research was employed to obtain data through surveys, interviews, and achievement assessments. The findings showed that nearly all students improved their academic standing and overall happiness as a result of the research. Online resources, peer group conversations, and the teacher's role all led to better levels of learning and active participation.

A research study by Soler et al. (2019) described the implementation and results of applying a flipped classroom strategy for teaching-learning. A sample of around 3000 students was taken in 17 different subjects at the university level. Their results revealed an increase in students' motivation and class attendance. Also, a comparison of final exam results of traditional and flipped classrooms revealed a decline in students' failure rate, proving that flipped classrooms improve students' learning.

Sun, Hu, Wan, Fu, and Wu did research in 2019 "to find out how pre-service teachers' ideas about engagement change in the flipped classroom." The study was done with 53 teachers-to-be in China who were taking classes on curriculum development. It was concluded that the flipped classroom could help students become more interested. The t-test results demonstrated that flipped learning had a positive effect on student performance regardless of the student's cognitive style. The study is regarded as a reliable resource for anyone interested in implementing the flipped classroom method in their courses.

"A qualitative study of student engagement in a flipped classroom" was done by Utheim and Foldnes in 2018. Twelve students were asked in-depth questions about how they learned with and without flipped classrooms. The first semester, they taught by flipping the classroom, and the second semester, they taught by giving lectures. The results showed that the flipped classroom had a strong effect on the emotional side of student engagement, in addition to improving the cognitive and behavioural sides.

In their 2017 study on Exploring students' engagement in writing using the flipped classroom approach was conducted by Danuri, Dwee, Jamari, and Samad. The study was conducted on 118 student volunteers with the help of a self-made questionnaire. Most of the students agreed that the flipped classroom approach forced them more likely to use the online platform as a source of information and helped them to do their assignments in a more interactive way. Respondents were of the opinion that the flipped classroom method made their learning easy and engaged them on all three levels: behavioural, emotional, and cognitive.

Rani and Muniandy's (2017) studied the effect of flipped classroom strategy on student engagement. The sample of the study comprised of 43 computer science students chosen through "purposive sampling" and given a "quasi-experimental" test. The results showed that the experimental group, i.e., the students who were taught in the flipped classroom, were more engaged and were able to apply academic concepts to a real-world situation.

Smallhorn (2017) studied flipped classrooms to boost student participation. To gauge student participation, 110 university students took part in a flipped classroom session. The entire course was on moodle. Students prepared for class by watching internet videos and resources. For analysis, surveys, student attendance, learning data records, and formative outcomes before and after flipped classroom methods were employed. Results showed a surge in positive attitude and student engagement. 95 per cent of kids found flipped classrooms positive and lively.

In an experiment involving 57 junior high school students, Mian (2016) examined the impact of student involvement on the flipped classroom. Flipped classroom education was also part of their research. To better understand student engagement, they looked at how students behaved as well as how they thought. According to the research, flipping the classroom increased both the behavioural and general levels of student involvement. An increase in the amount of time spent interacting between students and teachers, as well as between students in the same peer group, was discovered to be associated with a positive outcome in the study's findings.

Mohanty (2016) conducted a study on the efficacy and applicability of Flipped Classroom Instruction by comparing 8th graders' learning outcomes in History

and Science under flipped versus regular education. 90 Odisha primary school children were divided into control (conventional) and experimental (flipped) groups. After one month, post-test scores were compared to study instructional treatments. The resulting "t" values of both groups' post-test scores were significant at p 0.01 and confirmed the difference between control and experimental groups. The significant difference between flipped and traditional instructional groups' mean scores proved the favourable influence of the flipped model on History and Science learning outcomes.

In a secondary mathematics classroom, the effects of the flipped model of instruction on student engagement and performance were researched by Clark (2015). Pre and post-surveys, unit tests, interviews, and focus group sessions were used to assess the changes in students' perceptions. Results revealed that students were more engaged and involved in the flipped classroom as it allowed for optimum utilization of class time and used hands-on activities and project-based learning strategies. In comparison, there weren't any significant changes in the academic performance of students.

Jamaluddin, Md Osman & MD Osman (2014) investigated the use of the Flipped Classroom approach to enhance engagement and promote active learning." A quantitative descriptive survey was conducted on 24 undergraduate students. The results showed the effect of Flipped Classroom on engagement in the following sequence, with emotional engagement being the highest, followed by behavioural, cognitive, and agentic engagement. The results showed that flipped classrooms helped lecturers achieve their goals and helped in making the teaching-learning process more engaging, active, and student-centred. The study also revealed that flipped classroom learning improved active learning both inside and outside the class.

Tsimerman (2014) did a conference paper on the Flipped-Classroom Approach to analyze its effect on future learning. The study investigated students' assessments of the flipped classroom approach in an undergraduate course at the College for Academic Studies in Israel. The learners prepared for classes by watching videos in out-class activities, allowing the classroom to focus on discussion, exercises, and dialogue. The students stated that watching videos between lessons aroused interest, lessened boredom, and improved learning. They also reported that it increased their participation in learning, understanding of the learning material, and confidence in their capability to understand it.

Bishop and Verleger (2013) conducted a survey on flipped classrooms to analyze student perception of the same. The results of the survey showed that students had a positive perception of the flipped classroom. But as far as video lectures are concerned, they preferred in-person lectures, whereas they preferred interactive classroom activities over lectures. Evidence suggests an improvement in learning for the flipped classroom as compared to a traditional class. They recommend carrying out controlled experimental research to analyze the learning outcomes of the flipped classroom.

Another study, namely," The Flipped Classroom: Cultivating Student Engagement" by Tetreault (2013), examined the research on the flipped-classroom approach to education. Here, three case studies were reviewed, which served as exemplars of the flipped classroom approach. In conclusion, the benefits of flipped classrooms as evident in these three case studies, included increased engagement,

individualized education, enhanced higher-order thinking skills, and active and supportive learning by sharing of resources. They insisted that the flipped classroom approach should make use of simple, accessible, and familiar technology to be beneficial for both learners and educators.

Marlowe (2012) investigated the effect of the flipped classroom on student achievement and stress. Students were made to watch their lectures outside the class and were asked to do their second-year college assessment in the class. Students showed improvement in their semester results and reported lower stress levels. Students found this approach exciting and displayed positive feelings towards the treatment.

A study, namely," Flipping the Classroom to explore active learning in a large undergraduate course," was conducted by Zappe, Leicht, Messner, Litzginer, and Lee (2009). The traditional lecture was replaced by watching online videos so that more active learning, such as problem-solving, happens in the class. Assessment data were collected to examine students' perceptions of the flipped classroom for active learning and better understanding. They only preferred that half-course should be taught through a flipped classroom and half through the traditional classroom.

A research to study the effects of classroom flip on the learning environment was conducted by Owens and Strayer (2007). The study was conducted in the statistics class at the college level to compare traditional lecture/homework structure to the flipped classroom approach. The study suggested that though students felt more engaged in the flipped classroom, they were somehow less satisfied and showed unsettledness. It was advised not to implement a flipped classroom in any introductory class session.

Significant understanding gained from the scrutiny of the literature

- Several investigations have led researchers to the conclusion that the flipped classroom model is directly responsible for the rise in the level of student engagement; furthermore, this model and the rise in student engagement are closely interrelated. Research has indicated that using a flipped classroom method can make students more engaged in the material being presented in class.
- At both the secondary school and the senior secondary level, there is a continuing demand for psychometrically sound instruments that are both valid and reliable in order to quantify the level of student engagement.
- The process of digitalization and deciding on active learning methodologies can take a significant amount of time. For efficient implementation, adequate assistance is required, and this assistance must come from educational technology centres and technical instructional designers.
- Stimulation of affective dimension in the flipped classroom leads to a pleasant learning experience, which may be attributed to a feeling of being involved and of being noticed. This may be the case because the student feels like they are being acknowledged.
- Blended learning strategies, such as flipped classrooms, can be used in the medical and computer science fields to captivate students, encourage them to actively participate in problem-based learning sessions, and improve the quality of learning through the use of videos, flashcards, and many other similar aids. This can help students learn more effectively.

- Students' writing abilities can also be strengthened by engaging them in the flipped classroom model, in which videos and assignments are kept to the point, and students are aware of the specific learning goals they are working towards.
- Learners' motivation and interest can be piqued through the use of short and relevant videos, interactive sessions, and conversations. Students may have the opportunity to engage in meaningful learning with the implementation of the flipped classroom approach, especially the virtual flipped classroom approach (Sharma & Chowdhry, 2020).
- For enhanced student learning, teachers need to reflect on technical resources, professional needs, email accessibility, and students-focused pedagogy.
- Many studies have been conducted at the university and higher level. There still needs a lot of work to be done at the school level at high, middle, and elementary levels. The effect of the flipped classroom at the school level still needs to be explored.
- A number of studies have shown that students of the millennial generation have a preference for teaching methods such as the flipped classroom and that they are aware of the advantages of being presented with a variety of visual inputs, as well as more hands-on and practical approaches.

Conclusion

In conclusion, the Flipped learning strategy has indeed shown positive effects on student engagement. By flipping the traditional model of instruction students become more actively involved in their learning process. One of the main advantages of Flipped Classroom Learning is that it promotes active engagement and participation among students. By allowing students to review the lecture materials at their own pace and ability, they can deepen their understanding of the content and come prepared to engage in meaningful discussions and activities during class time. This not only encourages critical thinking and problem-solving skills but also fosters a sense of ownership in their own learning journey.

Moreover, the Flipped learning strategy enables students to personalize their learning experience. They can adjust their learning to their individual needs and preferences. This autonomy and flexibility in learning create a more inclusive and engaging environment for students, as their unique strengths and learning styles are taken into account. Another positive effect of the Flipped learning strategy is the enhanced teacher-student interaction. Teachers can dedicate more time to providing individualized support and guidance to their students. This personalized attention helps build stronger relationships between teachers and students, leading to increased student motivation, confidence, and overall academic performance. Furthermore, it encourages collaborative learning and communication skills. By engaging in group discussions, problem-solving activities, and project-based tasks during class time, students learn how to effectively communicate, collaborate, and negotiate with their peers.

Overall, the Flipped learning strategy has proven to be an effective way to boost student engagement. By promoting active learning, personalization, teacher-student interaction, and collaborative skills, it empowers students to take ownership of their education and prepares them for success in a constantly evolving world.

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