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Flipped Classrooms: Rethinking Traditional Teaching Methods

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ABSTRACT

The traditional approach to teaching, which often relies on lecture-based instruction, is increasingly being challenged by innovative educational strategies such as flipped classrooms. This paper explores the flipped classroom model as a viable alternative, particularly in engineering education. Flipped classrooms reverse the conventional structure by requiring students to engage with instructional content outside the classroom, freeing up class time for interactive, higher-order learning activities. This study highlights the effectiveness of this model in enhancing student engagement, improving comprehension, and fostering better teacher-student interaction. Despite its advantages, the implementation of flipped classrooms faces challenges, including ensuring equitable access to resources and managing student accountability. The paper concludes with insights into overcoming these challenges and suggestions for successful integration across various disciplines.

Keywords: Flipped Classroom, Innovative Teaching Methods, Student Engagement, Higher-Order Learning, Teacher-Student Interaction.

INTRODUCTION

Modern education emphasizes enhancing learning and its results. Students from higher secondary schools to professional colleges are continuously challenged to acquire more and more knowledge in less time, which in some cases hampers the quality of knowledge being gained. Educational institutions meeting the needs of students, industries, and the present era of science must seek innovative teaching and learning strategies. For effective learning, a common interest between the teacher and student is a “must,” which can be best realized if a twist in the approach and the way of looking at the same thing is done, i.e., frankly speaking, “thinking out of the box.” One such innovative approach is the “flip mode” of teaching, which is an ongoing trend across the globe. Some studies have evaluated the “flip mode” of teaching in various streams, i.e., Pharmacy, Sanskrit, Biology, etc. Hence a study was designed to observe this flip mode of teaching in an Engineering Course in which Sociology was taught. This study highlights the effectiveness of the flip mode of teaching over the traditional approach in an Engineering course and its sustainability as a boon for students in which knowledge is acquired in a sound and stable manner and mind blocking state does not occur. It was found that flip mode enhances students’ knowledge with a good score, comprehension, and ardency toward the subject, making it a successful innovative approach in the curriculum in fostering better student-teacher participation and interaction [1, 2].

UNDERSTANDING FLIPPED CLASSROOMS

Flipped classrooms have gained notoriety among educators and trainers alike as a means to rethink traditional teaching techniques. Complementing widespread use of easily-audible online lectures and video content, these regenerative techniques have inflected both K-12 and higher education. Classroom time is devoted to interaction instead of conference-style lectures—students review basic content outside class and arrive prepared to engage in higher-order activities, such as problem solving, case studies, and

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simulations. The broader goals of such activities are also pedagogically worthy: enhance college students' higher cognitive skills, intellectual prowess, reflective judgment, independent thinking, and intellectual creativity [3]. Those involved in higher education regularly admonish students to take charge of their own learning and to arrive prepared for class. Unfortunately, students who do so frequently seem the exception. In spite of the negative consequences that follow, K–12 and higher education consumers systematically fail to take responsibility for their own education. Historically, consumers of higher education lamented their experience as passive learners within a sea of sage-on-stage lectern-pounders who treat education like banking. Unaccustomed to developing inquiry skills, making judgments about novel information, and determining relevance, these passive learners avoid intellectually stressful environments, such as formal education, beyond that narrowly relevant for obtaining a desired job [4].

DEFINITION AND CONCEPT

A flipped classroom is “an educational strategy that moves activities, including those traditionally considered homework, into the classroom”. While the term “flipped classroom” is relatively new, the concept is not. Karl Fisch and Jonathan Bergmann didn't coin the phrase but first implemented its concept recently at Woodland Park High School in Colorado. Originally, the film was presented by Karl Fisch and subsequently introduced by Jonathan Bergmann to pass on the notion of valiant experiments made in the small Mountain State school. Since then, the idea has gained frank interest in a great number of schools worldwide [5]. The flipped approach significantly differs from traditional approaches to teaching, primarily regarding the coping of information. In a traditional classroom, the instructor teaches a lesson first and assigns students homework (read, write, compute, etc.) to reinforce the learning from that lesson in class. A flipped approach inverts this setup. Students partake simple learning activities (watching or listening to a presentation, for example) prior to class to 'absorb' a basic knowledge portion to a topic. Afterward, in class, they engage in more advanced learning activities (discussions, group projects, etc.) to fully understand that topic. More precisely, a flipped classroom enables classrooms where “students benefit from instructional activities in the classroom and learn course content as homework” [6].

HISTORY AND EVOLUTION

As a new method of teaching, the flipped classroom is relatively well-known among educators, having been introduced in at least modest form during the past ten years. Its exact origins, however, are less understood. Where did the concept come from? What occasioned its development? A careful review of primary materials, including accounts written by the pioneers themselves, uncovers the back-story behind a shift in teaching methodology that has taken place in some secondary and post-secondary education. Such knowledge should help educators to better understand this method of teaching, including its possibilities and limits. According to the literature and from listening to those involved, the flipped classroom concept first took hold in early 2000 in the United States and with significant contributions from a small group of teachers both in and outside the classroom, including Bergmann and Sams themselves, who designed and shared video lessons to use in lieu of lectures [7]. Independently, and unbeknownst to each other for several years, some university faculty began to experiment with the idea of using newly available technology to record their lectures on video, allowing students to watch them before class. During class, educators would then guide them through exercises applying this content. In a 2007 report written for internal university use, Eric Mazur described efforts to flip his introductory physics course. The video lectures he posted on media site YouTube became colorfully known as "YouTube Physics." Similar experiments followed in mathematics, chemistry, psychology, and biology until about 2010, when faculty members at the Massachusetts Institute of Technology created an online database of these early experiments under the name "Peer Instruction Network" and hosted conversations about them. During this period Bergmann, Sams, and several of these university faculty began to notice "massive energy and excitement" around their nascent flipped classrooms and “concluded that we were on to something big” [8].

BENEFITS OF FLIPPED CLASSROOMS

The flipped classroom represents a broader rethinking of conventional teaching methods that is growing in popularity among faculty and students. Faculty or their institutions create a video, typically 5 to 15 minutes long, that presents course material normally found in lectures or textbooks. This video is then uploaded to a learning management system, such as Blackboard, Moodle, or Coursera. Students in a flipped class are required to watch the video before class time. In a traditional classroom, the instructor usually presents a 50-minute lecture to the entire class; in a flipped classroom, students are divided into groups and actively engage with the material presented in the video. Instructors check for understanding of the video material and facilitate group activities to increase deeper thinking. During class time, faculty

are no longer the sole preserver of knowledge; they become learning facilitators by guiding the dense interactions between students and content, and between students themselves [9].

Interestingly, instructors at a number of universities, predominantly in the United States, have begun experimenting independently with “flipping” their courses in their own unique ways. In its purest sense, the term “flipped classroom” refers to the pedagogical model in which students watch video lectures before class and engage in active learning activities in class. It is a course design that aims to provide an interactive learning environment for students inside the classroom. These video lectures are integrated with in-class “exercises” using classroom technologies, e.g. student response systems, collaborative learning tools, and online discussion forums. The activities are designed to engage students actively in real-time, such as working in small groups or all-class discussions, thereby scaffolding collaborative and complex activities to deepen learning. However, in practice, many instructors have adopted only some elements of this model. The notion of “flipped” is sometimes less discussed than specific teaching practices associated with it [10].

IMPROVED STUDENT ENGAGEMENT

Many flipped classroom studies have evidenced an increase in student engagement. The flipped classroom enables students’ pre-class preparation, enhancing their interaction and participation. Pre-class preparation requires students to interact with the assigned learning materials. When prepared, students interact with their peers. Subsequently, they engage in discussions and group activities. Students United Nations, for example, required them to critically evaluate a country’s groups policy and engagement at an international conference. Students could therefore acquire mathematical knowledge in an active environment. During class, students actively engaged in discussions and collaborative group activities. When engaging in the learning tasks, students adjusted their levels of engagement, investing extra efforts to contribute to group discussions. The collaborative nature of their peers encouraged students to understand and explore the mathematical concepts more deeply. For instance, the in-class engagement of three to five students in a group was highlighted, whereas students would have difficulty asking questions in a traditional classroom. Additionally, in-group and peer discussions allowed them to realize the diverse thinking patterns and perspectives of their peers. Students also found using an interactive classroom response system helpful in visualizing the peer voting results [11].

ENHANCED TEACHER-STUDENT INTERACTION

Education systems all over the world pay attentive to innovative teaching methods. The flipped model of education is one of the recent approaches that has gained immense popularity and attention. The essential idea of this method is to flip the traditional class by moving information in the form of concepts or lectures outside of class and moving applications of these concepts inside class. The Flipped Class Model communicates concepts and lectures to students outside of their classrooms as a combination of time-independent video content in relatively short durations, or reading/reference materials, and engages students in the activities of the class, mainly problem-solving sessions, tutorial sessions for working on the assignments, group discussions, or competitions in large classes [12]. Even with the existence of the current flipped classroom models, there is still room for improvement in effectively engaging students, improving their performance, modifying the current assessment techniques, and consistency in the implementation of the flipped model. Apart from the concerns of destinations, students never flipped before were skeptical and fearful about the outcomes, effort required, technical problems, accessibility to resources and tools, and management of time to handle a workload of two courses with different contents, sizes, and instructors [13].

CHALLENGES AND SOLUTIONS

The flipped classroom model of education does present some hurdles that need to be overcome to have a smooth transition. One of the biggest challenges is ensuring that students have access to appropriate resources at home or wherever they are watching the class videos and other materials. Another significant hurdle is keeping students accountable for their at-home work. Teachers can't require a video to necessarily be watched in its entirety (or at all) since students could just let it play in the background and not pay attention to it. Teachers could follow up with quizzes or activities to do right after students watch the lesson, but those approaches also have their own pitfalls. Another challenge in employing a flipped classroom model is that teachers need to create video content, and for many teachers, this is a new endeavor. There is a learning curve in figuring out appropriate technology and software as well as figuring out how to effectively create engaging class videos. If other teachers are reluctant to shift their own teaching methods, it can create tension when one teacher shifts their style, and students have different expectations for other classes. Another challenge is finding large amounts of quality online content for students to watch if teachers choose to go that route. Additionally, teachers need to be ready

to answer questions about implementation as well as solving potential problems that come with using technology in the classroom. Teachers will also need to put a lot of initial time into making the shift, especially the first time they switch [14]. Proper planning and preparation can help to facilitate the transition into the flipped classroom approach. New initiatives should definitely start small, such as incorporating a single flipped lesson into a unit. Teachers should still focus on keeping students engaged in any video that is shown, putting thought into creating quality videos. Utilizing edited, concise video content available on the internet can help share the workload, and teachers should share content that they create. In terms of technology issues, teachers need to test everything beforehand. Teachers shouldn't be content to simply assume that students will all have their own devices ready to go. Preparing for potential tech problems is critical, and schools ought to be aware of this and have protocols for how to deal with them properly. Lastly, it is crucial to find a large amount of one or two types of tech to use [15].

IMPLEMENTING FLIPPED CLASSROOMS IN DIFFERENT SUBJECTS

The flipped classroom can be implemented in various subjects in a similar way. First, it is essential to assess the current situation in the class and the attitudes both students and teachers have towards the flipped classroom as a new approach. Second, the ICT tools necessary for the flipped classroom need to be provided to both students and teachers. Third, at the beginning of the implementation of the flipped classroom in a particular subject, explicit instructions should be given to students to ensure thorough understanding of the rationale of this approach, tasks and homework they are suggested to do. Careful reflection of the implementation of the flipped classroom should take place at the end of the first semester after its application in various subjects, and if necessary, changes and modifications should be made [16]. Implementing flipped classrooms appears more difficult in mathematics and science disciplines since their focus is on calculation and problem-solving, and research findings on flipped classrooms in these subjects are scarce. Other modifications are needed to applied flipped classrooms in a non-EFL discipline as well. Generally, totally different kinds of videos from teacher lectures need to be made [17, 18].

CONCLUSION

Flipped classrooms represent a transformative approach to education, offering significant advantages over traditional teaching methods. By inverting the usual instructional flow, students are encouraged to engage with course material actively and collaboratively, leading to improved comprehension and retention. This model fosters a more dynamic classroom environment, where teachers can focus on facilitating deeper learning and critical thinking. However, successful implementation requires careful planning, resource management, and ongoing support for both teachers and students. Addressing these challenges will be crucial for the broader adoption of flipped classrooms across various educational contexts. As educational institutions continue to evolve, flipped classrooms are poised to play a critical role in shaping the future of teaching and learning.

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