

Chapter 7

The Flipped Approach: Past Research, Practical Applications, and Experiences in K–12 Science and Math Classrooms

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ABSTRACT

Learning is an important part of the development of a child into a productive member of society. However, in today's society much of the pressure of learning is not put on the student, but rather the teacher. In order to promote adults as lifelong learners who can go out and help solve problems in this world, the focus of learning in the classroom needs to be on the students. A flipped classroom rather than a traditional classroom approach may help with this endeavor. Students gain many benefits from the flipped classroom where they can watch lectures at home that pass important concepts along to the students. This gives students more time in class with the teacher to perform guided inquiries, labs, problem sets, or extra practice on a content area. The effectiveness of student achievement, growth, lifelong learning ability, and opinion of integrating a flipped classroom into a secondary education classroom are examined in this chapter.

INTRODUCTION

Everyone that has attended a school can visualize what a traditional classroom looks like. In the traditional classroom you would see students and a teacher. The students are presented information by the teacher and are then expected to go home and complete the homework for practice. Typically, as students are asked to take notes in

a traditional classroom, there is groaning and audible sighs. Comments such as, “Why do we have to take notes?” can be collectively heard from students. Upon looking out into the classroom, students can be seen aimlessly writing the notes down because they are told to do so. It wouldn't matter if the teacher were to stand on the desk and dance; students would still be seen zoning out and uninterested in the lecture. Learning that

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is boring, not engaging, or spoon fed does not excite the students and thus there is a suspicion of how much learning is really going on. The teacher wonders whether the students are achieving their full potential.

An article entitled *Teaching Content Outrageously*, by Stanley Pogrom (2010), discusses ways to truly engage students. Pogrom reasons that in the United States considerable work has been done on the science and psychology behind learning, yet less research has been conducted as to how to better engage our students. This leads us to consider how we might better engage our students. One of the latest concepts is the “inverted classroom”, popularly termed the “flipped classroom” approach to learning, and the desire to find whether it creates a better learning arrangement for student achievement.

A flipped classroom is just what it sounds like, a classroom that is set up the opposite of what we usually think a classroom to be. In the article, *Flipping Classrooms*, in a 2011 edition of Phi Delta Kappa Young describes a flipped classroom as “one in which instruction or notes are completed independently at home while the students come to school for school work or labs”. Teachers can record lectures using proprietary multimedia software in conjunction with an interactive whiteboard. These materials can be uploaded to a course website where students can access them through various means. According to Fulton (2010), students can watch the video at whatever pace they are comfortable. If they want to rewind or re-watch the lesson, they can. If they don’t understand something, they can either go back to the part they don’t understand, or they can potentially look it up on the internet. This teaching method allows students to be in charge of their own learning. When the student attends class, they complete practice problems or other assignment with a teacher present. This is usually assigned as homework, but in the flipped approach the teacher is able to offer greater one-on-one support.

By providing class time to work on what used to be homework, students would have the opportunity to work on assignments with a peer, group, or with teacher assistance. Rycik (2012) states that through the work time in-class, the teacher can get a grasp of how well the students understand the material and if they need to over something that an individual or several students do not understand. This classroom method could be very beneficial for students who normally struggle with a subject area; those students can benefit from enhanced support throughout the course. It also gives students the opportunity to collaborate with peers, further deepening their own understanding and content retention. Fulton (2012) states many parents of traditional students are frustrated because they don’t know how to help their child with their homework. The flipped classroom can reduce stress on parents and increase student ownership of their learning. Mansilla and Gardner (2010) state “subject-matter learning may temporarily increase student’s information base, but it leaves them unprepared to shed light on issues that are even slightly novel. A different kind of instruction is in order, one that seeks to discipline the mind.” (p.193) Subject matter learning is one in which memorization occurs and students may retain the material for a period of time. However, this is not the type of learning that causes the brain to be used, exercised, and “disciplined.” It is believed that the flipped classroom better supports this. Students need a basis of understanding and that is usually given in notes, but the application of the content in the notes, where they have to use it and apply it, is where the brain is truly being productive or “disciplined.” The flipped classroom would work well many classrooms but especially in a science classroom, because students can receive the background knowledge through videos at home and then perform labs to reiterate what they had learned at home. This ability for students to make connections between content and practice could be instrumental to their learning.

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