Flipped Classrooms

Evie Howell & Pamela Smalley

Student Centered   Transformative Learning   Engagement

With limited in-class time and different speeds of learning among students, the flipped classroom approach offers teachers and students an alternative that is student-centered (Corwin, 2020). In flipped classrooms, students take on an active responsibility of learning the course material before coming to class, instead of passively learning through in-class lectures (Yin, 2020). With the responsibility of learning placed mainly on students, this teaching method shifts from what was previously teacher-led to learning that is student-led. Flipped classrooms provide opportunities for students to be more engaged in directing the depth of mastery and speed of learning that is individualized to them (Yin, 2020). Although flipped classrooms are a relatively recent learning adaptation, this approach has been shown to yield certain improvements and limitations when compared to more traditional learning classrooms (Eppard & Rochdi, 2017). This chapter will explore the definition of flipped classrooms, their origins, outcomes, and limitations.

What is a Flipped Learning Classroom?

Flipped learning is a recent strategy used to help students become more active and engaged learners. It is the "flipped" concept of traditional learning classrooms. Flipped learning classrooms consist of two parts: 1) learning at-home material that can be delivered through various technological formats, and 2) doing exploratory and peer-collaborative activities in class (Yin, 2020). Instead of passively learning course materials, students watch assigned videos or complete readings before class (Yin, 2020). This student-centered approach encourages students to take control of their learning, as students are able to control their learning pace, review segments that are more complicated or skim through those that come more easily, thereby gaining mastery of the topic (Yin, 2020). The idea is that students will have a better foundation of course materials, and as a result, teachers are able to use limited class time for problem-solving or collaborative activities pertaining to the studied topic; thus students can enhance their learning through concept application, and peer collaboration (Sergis et al., 2018). Flipped learning classrooms often differ from traditional learning classrooms in the sense that students begin to take a more active role in their learning, and teachers take on the role of mentor and co-collaborator instead of lecturer (Eppard & Rochdi, 2017; Yin, 2020).

Origins of Flipped Classrooms

The history of flipped classrooms began with studies in the United States. Even though the concepts of homework and studying at home are quite traditional, the origins of flipped classrooms (or inverted learning) can be traced back to the year 2000 when Lage, Platt, and Treglia used the "inverted classroom" learning strategy in two of their college-level economics classes and published their study in a journal article (Eppard & Rochdi, 2017). The main concept was to "have events that traditionally take place in the classroom now take place outside the classroom and vice-versa" (Lage et al., 2000, p. 32). Lage and her colleagues inverted their classrooms by assigning students to watch video-recorded

lectures before class and then used class time for answering questions and doing lab work (Lage et al., 2000). This student-centered method allowed students to learn the material at home and then come to class and lead the discussion through their questions. If there were no questions, the instructor assumed that the students had mastery of the topic (Lage et al., 2000) and would move on to the hands-on application. Their results showed positive perceptions from both students and instructors (Lage et al., 2000). In the same year that Lage et al. published their study on inverted classrooms, J. Wesley Baker presented his research on a similar "new" learning approach called flipped classrooms in Florida, at the 11th International Conference on College Teaching and Learning (2000).

Even though the concept of "flipped classrooms" was introduced in academia in 2000, it took a little longer for it to make its way into everyday classrooms and educational practices. Eight years after Lage et al. and Baker introduced flipped classroom learning, Jonathan Bergmann and Aaron Sams, two chemistry high school teachers from Colorado, started implementing this learning approach. It was in 2008 that flipped classrooms became generally popularized (Butt, 2014). Bergmann and Sams decided that they wanted to spend in-class time doing experiments and other hands-on activities, so they recorded their chemistry lectures onto different technology formats (i.e., videos, audios) for students to access from home. This form of student-centered learning allowed students to leverage learning from home at their own pace and level of comprehension, and engage in collaboration with peers at school. With the combining powers of the Internet and YouTube, educational content became easily accessible to everyone, inside and outside of the classroom. Education was no longer limited to what teachers could teach through traditional means, but rather, it became a matter of individuals choosing what they wanted to learn and in which format. Today, teachers, instructional designers, and companies like Khan Academy are collaborating in the development of content for flipped classroom learning (Butt, 2014).

Outcomes of Flipped Classrooms

Studies of flipped classrooms have shown an increase in both students' positive attitudes toward learning and overall academic performances. These outcomes are important indicators that flipped classrooms are effective in educational pedagogy.

Affective

Student attitudes and perceptions play an important part in learning. In a study performed by Sergis, Sampson, and Pelliccione (2018), secondary education students from three different courses were assessed and surveyed to gauge the effects of flipped classrooms and traditional classrooms on "students' cognitive learning outcomes, and also the internal impact on students' satisfaction as well as their self-determination for their learning" (Sergis et al., 2018, p. 372). With six classes total (two from each of the three different courses), half were taught the same materials through the flipped classroom approach (experimental groups), while the other half were taught in person (control groups). In each of the sample sets, students in flipped classrooms scored higher on assessment tests and claimed to have greater levels of satisfaction, confidence, and relatedness than the students who were taught traditionally in person (Sergis et al., 2018). Furthermore, the analysis from this study showed that students who were low performers (from based line tests) had a higher increase in satisfaction, confidence, competence, and relatedness than their peers who were medium- to high-performing students (Sergis et al., 2018). The researchers from this study believed that these positive outcomes derived from the increased time of active engagement and interactions with teachers and peers in the classroom (Sergis et al., 2018). In other qualitative studies of flipped classrooms, similar results have emerged of positive attitudes, feedback, and perceptions from both students and teachers (Akçayır & Akçayır, 2018).

Academic Outcomes

In addition to qualitative studies, researchers have shown through quantitative studies "using grade point averages, standardized test scores, and course grades" (Akçayır & Akçayır, 2018, p. 338) that flipped classrooms are more effective in improving learning performance than traditional classrooms. In a meta-analysis conducted by Akçayır and Akçayır (2018), they concluded that 52% of flipped classrooms showed higher learning improvements than traditional

classrooms. In the remaining 48% of studies, students in flipped classrooms performed as well as or worse than students in traditional classrooms when "measured by GPAs, standardized test scores, and course grades" (Akçayır & Akçayır, 2018, p. 338). Moreover, the effectiveness of learning in a flipped classroom extends to better in-class time management and increased flexibility accounting for different learning speeds and levels (Akçayır & Akçayır, 2018).

Greater student participation in the teaching process and collaborations have been shown to improve overall learning. In a 2020 study, Yin examined whether having students help teach courses during class time, independently or in collaboration with teachers, would further improve student learning (Yin, 2020). This strategy allowed students to learn the course materials outside of class and then take what they learned to teach other students in class. With this responsibility of teaching, students took learning outside of class more seriously. In addition to average test scores improving by 6.63%, this research showed that flipped classrooms also contributed to an increase in student attendance and positive collaboration among peers (Yin, 2020). Collaborative opportunities allow students to interact and learn from one another, while "effective collaboration among group members facilitates cognitive growth and knowledge acquisition, and consequently leads to better performance" (Yin, 2020, p. 76). It is in the active process of engagement, students become better learners.

Limitations and Criticisms for Flipped Learning Classrooms

While there are positive outcomes for flipped learning classrooms, they are not without faults. Discussed below are several ways in which flipped learning classrooms may not be as developed or successful as traditional learning classrooms.

Time

As any seasoned student knows, classwork takes time. In the case of flipped classroom learning, time dedicated to the work involved for flipped classroom learning increases for both teacher and student. In comparison to traditional classroom planning, it generally takes more time to prepare for and carry out flipped learning classroom techniques (Akçayır & Akçayır, 2018). In a 2014 study, Butt surveyed two groups of university students: one group experienced a more traditional classroom setting while the other experienced a flipped classroom setting. When categorizing survey responses, the researcher found that one of the most common negative responses from students in the flipped classroom was regarding the amount of time it took to prepare for classes in comparison to traditional learning classrooms (Butt, 2014).

Adaptability

There are many styles of implementing flipped classrooms that may not have a high level of adaptability for each group of students. In many cases, teachers create educational materials that are specific to only their group of students with little room for adaptability in different classrooms, grades, or cultures (Herreid & Schiller, 2013). In a research study by Herreid and Schiller (2013), researchers surveyed members of the National Center for Case Study Teaching. Of approximately 15,000 respondents who self-identified as teachers, approximately 200 of them said that they used flipped classroom learning in their educational institutions. The teachers in this survey reported creating specificity and detail in their programs, making their resources only applicable to their specific classrooms (Herreid & Schiller, 2013). This approach creates less adaptability for other educators in the future wanting to use their materials. In contrast, classes that have high adaptability contain their own unique drawbacks. In a recent study, researchers Eppard and Rochdi (2017) found that classrooms that demonstrate a high adaptability rate are very difficult to study. This may be because flipped classrooms that are high in adaptability often contain varied content and learning approaches, making it difficult to pin down exactly what factors contribute to making flipped learning classrooms either effective or ineffective (Eppard & Rochdi, 2017).

Autonomy

While at times considered a strength, a possible weakness of flipped learning classrooms is the autonomy given to students to control aspects of their learning. An important element of flipped learning classrooms is the pace at which students do work outside the classroom (Butt, 2014; Herreid & Schiller, 2013; Milman, 2012). Students' personal decision-making contributes to the pace of the class, which can occur at different rates; if students fall behind on their own time, teachers must take time filling in important details and supporting each student in what they missed from take-home video lectures (Milman, 2012). Additionally, by not being able to exactly control the environment in which outside learning is done, teachers may face a variability of knowledge among students (Milman, 2012). For example, when viewing videos created by teachers outside of class, students may multitask by watching other videos at the same time or may not have the technology available to watch or listen to what is being taught, which increases the likelihood that important concepts may be missed and need to be recapped in supportive class time (Milman, 2012).

Accessibility

A final important limitation to note is that ESL students and those with disabilities may have a harder time with flipped learning environments and their needs must be taken into account (Milman, 2012). Accessibility in classroom learning has been inconsistent at times and will continue to be so as a new way of student-led learning is introduced into a mainstream setting. One important factor in flipped learning classrooms is the incorporation of technology as a learning staple, which can affect the accessibility of a flipped classroom for those in K-12 schools and beyond (Milman, 2012). When viewing or listening to learning materials at home, ELLs or students with learning challenges do not have a way to ask questions in real time or participate in scaffolding activities with other classmates, which may affect the success of flipped classroom learning (Milman, 2012). To improve accessibility in flipped classroom learning, digital materials are needed that meet accessibility standards and can be used by all students.

Conclusion

Although flipped learning classroom approaches are not ideal in every teaching scenario, they can be beneficial in student-centered learning programs. They have been shown to positively affect student learning and increase engagement and mastery of topics by helping students make the connection between pre-class materials and real-life applications (Lo & Hew, 2017). Flipped learning classrooms have many positive learning outcomes, but most of these outcomes are achieved when teaching and technology are applied thoughtfully and carefully (Butt, 2014). Flipped learning classrooms are an important tool to be considered when building educational programs and should continue to be studied, implemented, and evolved in the future.

References

Akçayır, G., & Akçayır, M. (2018). The flipped classroom: A review of its advantages and challenges. *Computers & Education*, *126*, 334-345.https://doi.org/10.1016/j.compedu.2018.07.021

Baker, J.W. (2000). The 'classroom flip': Using web course management tools to become the guide by the side. Paper presented at the *11th International Conference on College Teaching and Learning*, Jacksonville, FL: April 12-15.

Butt, A. (2014). Student views on the use of a flipped classroom approach: Evidence from Australia. *Business Education & Accreditation, 6 (1)*, 33-43.https://www.theibfr2.com/RePEc/ibf/beaccr/bea-v6n1-2014/BEA-V6N1-2014-4.pdf

Corwin, S. (2020, October 30). Flipped classrooms: Everything you always wanted to know. *Teacher Academy*. https://www.teacheracademy.eu/blog/flipped-classroom/

Eppard, J., & Rochdi, A. (2017). A framework for flipped learning. *Proceedings of the 13th International Conference on Mobile Learning*, *2017*, 33-40.

Herreid, C. F., & Schiller, N. A. (2013). Case studies and the flipped classroom. *Journal of College Science Teaching*, *42*(5), 62–66. http://www.jstor.org/stable/43631584

Lo, C. K., & Hew, K. F. (2017). A critical review of flipped classroom challenges in K-12 education: Possible solutions and recommendations for future research. *Research and Practice in Technology Enhanced Learning*, *12*(1), 1-22. https://doi.org/10.1186/s41039-016-0044-2

Milman, N. B. (2012). The flipped classroom strategy: What is it and how can it best be used?. *Distance Learning*, *9*(3), 85.

Sergis, S., Sampson, D. G., & Pelliccione, L. (2018). Investigating the impact of flipped classroom on students' learning experiences: A self-determination theory approach. *Computers in Human Behavior*, *78*, 368-378. https://doi.org/10.1016/j.chb.2017.08.011

Smith, J. P. (2015). *The efficacy of flipped learning classrooms.* (Doctoral dissertation, McKendree University).

Yin, H. (2020). Exploring the effectiveness of a flipped classroom with student teaching. *E-Journal of Business Education & Scholarship of Teaching, 14(1),* 66-78.https://files.eric.ed.gov/fulltext/EJ1276429.pdf

Zainuddin, Z., & Halili, S. H. (2016). Flipped classroom research and trends from different fields of study. *International Review of Research in Open and Distributed Learning*, *17*(3), 313-340. https://doi.org/10.19173/irrodl.v17i3.2274