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Exploring undergraduates' perspectives and flipped learning readiness in their flipped classrooms

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ABSTRACT

This study surveyed 84 undergraduate students, majoring in education, in order to gather their perspectives regarding flipped classrooms and investigate their readiness levels for flipped learning. After the implementation of flipped learning for an entire semester, surveys were distributed in two flipped classrooms that were taught by the same instructor. Students showed particular preferences for the "Bring Your Own Device" and the Instant Response System features of the flipped classroom. Approximately 60% agreed with the idea of flipped classrooms, but only 39% agreed that the flipped classrooms met their learning needs. Their readiness levels for flipped learning were moderately above the average levels, and males or juniors (compared with freshmen), felt more prepared for flipped learning. In general, course grades, self-directed learning readiness, and group work preference can predict the different readiness dimensions. The findings may enhance educators' understanding in how to apply the flipped learning model in ways that are most beneficial for their own students.

1. Introduction

Due to the emergence of instructional technologies, student-centered instruction has become more feasible over the past decade. Studies have indicated that student-centered instruction can lead to higher levels of learner autonomy, performance, and motivation (Smit, Brabander, & Martens, 2014). One of the most effective student-centered instructional models, the flipped learning approach, reverses the learning process from the traditional classroom by having students review learning materials before coming to class. Later, during a class session, teachers will guide students through homework assignments, problem-solving exercises and peer interaction sessions, in order to promote differentiated instruction, personalized learning, and high-order learning (Yarbro, Arfstrom, McKnight, & McKnight, 2014). As such, while students have to take control of their own learning, they can acquire personalized assistance. Throughout the entire process, the latest instructional technologies, especially video recording technologies, are integrated in ways that facilitate and nurture learning and teaching for both students and teachers (Bergmann & Sams, 2012).

Although some studies (Flumerfelt & Green, 2013; Tune, Sturek, & Basile, 2013) claim that students in flipped classrooms may outperform their counterparts in traditional lecture-based classrooms, other studies indicate that students' responses and readiness for flipped learning are not comprehensively positive (Missildine, Fountain, Summers, & Gosselin, 2013; Wilson, 2013). To better understand the flipped learning approach, this study investigated undergraduates' perspectives of flipped classrooms, their flipped learning readiness, and individual characteristics.

2. Literature review

2.1. Flipped classrooms

In recent years, the flipped learning model has become a fashionable instructional development in educational technology, particularly in the ways that technology relates to higher education (Johnson, Adams Becker, Estrada, & Freeman, 2014; Johnson, Adams Becker, Estrada, & Freeman, 2015). In particular, digital videos have become the most popular form of technology employed in flipped classrooms (Bergmann & Sams, 2012), due to their wide accessibility on the Internet, including YouTube and related web sites. The Khan Academy collaborated with Microsoft to create a digital video library for K-12 students to facilitate academic learning, illustrating the type of online resources available for flipped classrooms. Two

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high school chemistry teachers in Colorado successfully facilitated a flipped learning classroom in 2007. The teachers created PowerPoint slides and online video content so that students living in rural areas could view live lessons on YouTube before coming to class. During classroom meetings the teachers guided their students through the work that had been assigned. The teachers eventually found that their students were more engaged in classes and achieved better performance as a result of this new methodology (Bergmann & Sams, 2012).

While much has recently been made of flipped learning, it is not a new concept. In fact, flipped learning is based on the same framework that characterizes inverted classrooms, reversed instruction, and blended learning (Yarbro et al., 2014). Thus, students complete previews before coming to class, and teachers make the best use of class sessions by steering students through assignments, problem-solving, group discussions, and interactive classroom activities. Although no flipped classroom is identical, there are several important components that constitute the flipped method. For example, Hamdan, McKnight, McKnight, and Arfstrom (2013) created the acronym FLIP to highlight the key features of flipped classrooms, noting that a *Flexible environment* helps create a *Learning culture* with *Intentional content*, which requires a *Professional educator*. As noted in *Policy Maker Scenario: Flipped Classroom* (Panzavolta & Carvalho, 2013), European Commission's Creative Classrooms Lab called for teachers to take advantage of emerging technologies to support their roles as facilitators in classroom learning. The idea is that student-centered learning environments, student empowerment and higher levels of student satisfaction with learning would emerge as a result (Smit et al., 2014).

The flipped learning model, which carries the true spirit of student-centered pedagogy, has being gaining increased attention at all levels of academia. Recent empirical studies have documented this latest trend in the field. For example, Baepler, Walker, and Driessen (2014) compared a traditional lecture-based course (about 340 students) in a chemistry department at a U.S. university in spring 2012 with two "active learning" courses in fall 2012 (about 340 students) and spring 2013 (about 314 students) in the same department. The study in Spring 2013 replicated the study in Fall 2012. Overall, approximately 55% of the students were female, while 80% were either freshmen or sophomores for the three courses analyzed. In contrast to the traditional lecture-based method, the two active courses blended face-to-face meetings with online resources, flipped some lectures with problem-solving activities (e.g., small group analytical exercises and computer simulation tasks), and utilized several interactive activities (e.g., question-and-answer sessions using Clicker, an instant response system). The two active courses combined aspects of both flipped and blended learning. The two flipped/blended courses produced student learning outcomes that equaled or exceeded the traditional lecture-based course. Moreover, the students in the flipped/blended courses reported higher satisfaction with their learning experience than their counterparts.

Forsey, Low, and Glance (2013) flipped a four-credit Australian Studies course by requiring that students take a nine-module massive online open course (MOOC) in sociology before attending 2-h weekly classes. They found that most of the students had the technological skills necessary for the course, expressed a neutral attitude toward flipped learning, and a few responded negatively. Most importantly, however, was the fact that engaged learning, peer learning, and structured learning activities clearly contributed to higher scores in quizzes. In general, 53% agreed or strongly agreed that the flipped classroom suited their needs. Moreover, more than 80% believed the flipped course design provided an effective learning experience. The interview results indicated that while some students were more accustomed to traditional face-to-face lectures, they appreciated the flexibility that online learning resources provided.

Wilson (2013) flipped an undergraduate statistics course with 53 students by greatly decreasing the amount of time spent lecturing while increasing the number of interactive activities during class time. Online reading quizzes were administered before each class to motivate students to complete reading assignments. Students were also encouraged to search for online resources to answer questions that arose from their reading. Traditional lectures were minimized; knowledge transmission occurred outside of the classroom. During class sessions, students worked on group work assignments, team projects and group presentations. An end-of-the-semester survey showed a higher course evaluation rating than in previous semesters. Moreover, the students' attitudes toward the course and the instructor improved, and their grades were higher. Then, several students complained about the quizzes on their online reading previews. Only 48% of them considered the reading quizzes to be helpful. In contrast, 58% indicated that reading the textbook was helpful.

Strayer (2012) compared the learning environments of a flipped introductory statistics course with a traditional lecture-based course, taught by the same instructor at the same university. Overall, 23 students from the flipped class and 26 of the students from the lecture class participated in the study. Gender was evenly split for both classes, and most of the students were either freshmen or sophomores who were majoring in a wide variety of disciplines. End of the semester surveys, interviews, and field notes were used to ascertain the effects and results of the contrasting teaching styles. The results indicated that "inverted classroom students were more open to cooperation when compared with traditional classroom students for both their preferred learning environment and their actual classroom experience" (Strayer, 2012, p. 190). Moreover, students from both groups preferred similar levels of task orientation, but students in the flipped classroom indicated significantly lower levels of task orientation than the students in the traditional setting (Strayer, 2012).

Yarbro et al. (2014) summarized recent research on flipped learning from K-12 to post-secondary education. Generally, flipped learning has been used in most disciplines, including math and foreign languages. In higher education, flipped learning has also been used in physics, chemistry, nursing education, statistics, human-computer interaction, pharmaceutics, and STEM courses. While some studies (Dill, 2012; Ruddick, 2012) report educational benefits of flipped learning such as improved student performance, others (Clark, 2013; Lape, Levy, & Yong, 2014) question the effectiveness of flipped learning. Additionally, while some students performed better in flipped classrooms, they reported less satisfaction with their flipped courses (Missildine et al., 2013). The limited number of empirical studies on flipped classrooms has shown conflicting results, emphasizing the need for more empirical studies to investigate related issues in different learning contexts.

To date researchers have not reached an evidence-based consensus with regard to the feasibility of the flipped learning approach. In the same way that many question the effectiveness of technology, the debate over the value of the flipped learning model continues. Yet, one of the key points in the argument over flipped learning, as Yarbro et al. (2014) noted, revolves around the question, "Are students truly ready for the flipped approach?" Thus, in order to maximize the benefits of the flipped approach, we need to know students' perspectives regarding flipped learning as well as students' readiness for flipped classrooms.

2.2. Individual differences

One advantage of flipping a classroom is that it can personalize