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## **STUDENT BEHAVIORS AND PERCEPTIONS IN A FLIPPED CLASSROOM: A CASE IN AN OPERATING SYSTEMS COURSE**

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**ABSTRACT:** In technical majors like computer, in laboratories of which students could only have access to hardware and software, using time effectively is of the essence. For students to gain experience, it is important that they have experiments in courses like Network Systems and Server Operating Systems. With the development of internet and Learning Management Systems, more and more instructors have started to flip their courses by using technologies like videos, online homework, social networks, and forums. In a flipped class, students have the responsibilities of their learning. Lessons are presented online, instructors guide the in-class applications and interact more with their students. Having the aim of learning students' opinions on flipped classes, this study was implemented in a four-hour Network Systems Laboratory with the participation of 25 students, who took the Operating Systems Course in a vocational college during the spring semester of 2015-2016 Academic Year. Instructors loaded the maximum 10-minute videos, course materials and projects on the system. Under the guidance of their instructors students did the weekly projects in class. Three application tests, the averages of which were 54.20, 89.16, and 86.8 respectively, were given to students through the semester. Students were interviewed right after the first and third test applications. After the first test, students reported that the visuals were good, but they preferred the lessons to be delivered by the instructors; after the third test students stated that they did more applications during classes and in laboratory hours of other courses this method also could be utilized to provide more space for applications. The results of this study showed that flipped classes could be effectively used in courses where students don't have much time for applications outside laboratory hours, however students need to be informed of the method and the expectations right at the beginning.

**Key words:** Flipped classroom, student perception, blended learning, operating systems

### **INTRODUCTION**

The flipped classroom is one of fashionable student-centered instructional models. Flipped classroom model inverts the learning procedure from the conventional classroom by acquiring students review course materials such as videos, lecture notes, trial exams before class time. To flip classroom, instructors use the most recent technologies such as digital videos to ease and foster instruction and students' learning (Bergmann & Sams, 2012). Especially in technical majors like computer, in laboratories of which students could only have access to hardware and software, using class/laboratory time effectively is of the essence. For students to gain experience, it is important that they have experiments in courses like Network Systems and Server Operating Systems. In these courses, students' autonomy, performance, and motivation can be improved by taking students to the center of instruction (Smit, Brabander, & Martens, 2014).

With the development of internet and Learning Management Systems, more and more instructors have started to flip their courses by using technologies like videos, online homework, social networks, and forums. In a flipped class, instructors take the role of a facilitator while students have the responsibilities of their learning. Lessons are presented online, instructors guide the in-class applications and interact more with their students, while

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students work on projects, assignments and interacts with classmates in order to support specialized instruction, individualized learning, group learning and high level learning (Yarbro, Arfstrom, McKnight, & McKnight, 2014).

Some studies (Flumerfelt & Green, 2013) claim that flipped classroom learners may surpass their peers in conventional classrooms, while some others point out that learners' responses for flipped classroom are not completely positive (Wilson, 2013). The main purpose of this study is to investigate vocational college students' perceptions of a flipped Operating Systems course.

## METHODS

The purpose of this qualitative study was to describe vocational college students' experiences of a flipped Operating Systems course. This study was implemented in a four-hour Network Systems Laboratory with the participation of 25 students, who took the Operating Systems Course in a post-secondary vocational college during the fall semester of 2015-2016 Academic Year.

Instructors loaded the maximum 10-minute videos, course materials and projects on the system. Students watch online videos and read lecture notes on the Course Portal, MOODLE platform, before class. Under the guidance of their instructors, students completed the weekly projects in class.

Three application tests, the averages of which were 54.20, 89.16, and 86.80 respectively, were given to students through the semester. All participants were presented the same learning resources and application tests were used to determine if students had watched videos or read lecture notes. The application tests included authentic subjects related to operating systems.

In order to understand the learning environment of the flipped Operating Systems course data were gathered in two distinct steps. Students were interviewed right after the first and third test applications. Data were collected to better understand the experiences of vocational college students during the flipped Operating Systems course. All Operating Systems course participants were took part in the interviews. Interview questions were designed to identify student perceptions about the model and how this flipped model affected their learning, as well as ideas for enhancing the course.

## RESULTS and FINDINGS

After the first test, students reported throughout the interview that the visuals were good, but they preferred the lessons to be delivered by the instructors. Since it was a method they were not used to at all, they stated that they expected the instructors deliver the lesson and that's the reason they didn't ask any questions during class time. After the third test, students stated that they had more time for more applications during classes and suggested that in laboratory hours of other courses this method also could be utilized to provide more space for applications. They reported that, in need of an instructor's guidance at moments of confusion or lack of understanding, watching the videos uploaded on the portal was very helpful. Having free interaction with classmates and receiving timely support from their peers during classes were also listed among the positive contributions this method had on their learning.

## CONCLUSION

The aim of this qualitative study was to describe students' perceptions of the flipped Operating Systems course. The results of this study showed that flipped classes could be effectively used in courses where students don't have much time for applications outside laboratory hours; however, students need to be informed of the method and the expectations right at the beginning. Additionally, participants experienced that the flipped classroom model used multiple instructional materials that enhanced their individual learning.

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