How I used flipped learning to inform my teaching?

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Abstract

This paper aims to reflect upon the experience of using flipped learning in a college class. After presenting the alignment of learning objectives and assessments, evidence-based evaluation was provided as rationale for changes. Approaches taken to improve learning were then elaborated. Further assessment of impact of change on student learning was given. Lessons learned from using flipped learning were also discussed.

Keywords: flipped learning, reflection, college class

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Flipped learning is a pedagogical approach in which direct instruction moves from the group learning space to the individual learning space, and the resulting group space is transformed into a dynamic interactive learning environment where the educator guides students as they apply concepts and engage creatively in the subject matter (Flipped Learning Network, 2014). The idea of shifting instruction to students before the class and using class time for assignments allows students to learn the basic concepts on their own and explore the concepts in depth during the class.

I used the flipped learning concept to flip the last four lessons in General Education Psychology in Fall 2014. Table 1 presents the alignment of learning objectives of the last four lessons and the respective formative and summative assessments. The differences between these four lessons and the previous lessons were that discussion forum was added to the formative assessments; and students were asked to watch videos, read PowerPoint slides, take a practice test, and post to a discussion forum before each lesson.

Table 1. The alignment of learning objectives and assessments of the last four lessons.

Learning Objectives	Formative Assessments	Summative Assessments
Applying teaching concepts to daily life situations.	Exit slips: Students wrote their responses to a question at the end of each lesson.	In-class tasks: There was one individual task in each lesson.
Analyzing and evaluating daily life situations with teaching concepts.	Practice tests: Students took a practice test before and after each lesson.	Unit test: There was one test at the end of the four lessons
Explaining, illustrating, and discussing classroom observation with teaching concepts.	Discussion forum: Students posted responses to a question before each lesson.	Field report: Students explained, illustrated and discussed classroom observation with teaching concepts.

Rationale for Change

The flipped learning allowed students to construct their own knowledge by responding to the discussion forum, engaging in in-class tasks, writing exit slips, and completing a field report. To investigate the impact of flipped learning on students' performance, I conducted a study to compare the summative assessments and teaching practices under different learning conditions. There were 12 lessons divided by three themes: Development, learning and teaching. In addition to attending lecture, students completed in-class tasks and exit slips in each lesson, and took a unit test and wrote a field report after each theme or four lessons. In the control condition of the four lessons on "development," students watched videos and read PowerPoint slides during the class. In the testing condition of the four lessons of "learning," students watched videos and read PowerPoint slides during the class, and took practice tests before and after each lesson. In the flipped learning condition of the four lessons on "teaching," students watched videos, read PowerPoint slides, and posted to the discussion forum before each lesson; and took practice tests before and after each lesson. Table 2 presents students' performance on summative assessments**.** Flipped learning had the biggest impact on unit tests than the other learning conditions, but fared the same as the other learning conditions on in-class tasks and field reports.

Table 2. The Percentage of Correct Responses of Summative Assessments by Learning Conditions (N=18)

Learning Conditions	In-Class Tasks	Unit Tests	Field Reports
Control	99%	71%	96%
Testing	93%	71%	99%
Flipped Learning	98%	88%	99%

To understand why flipped learning was more beneficial, students rated the helpfulness of the teaching practices in preparing themselves for the unit tests (Table 3). In the flipped learning condition, students found it helpful to watch videos and read PowerPoint slides before the class, engage in in-class activities and write exit slips during the class, and take practice tests before and after the class. However, students found that attending lecture and posting to discussion forum were less helpful practices.

Table 3. The Rating of the Helpfulness of the Teaching Practices by Learning Conditions (N=18; Range=1-100)

Teaching Practices	Control	Testing	Flipped Learning
Lecture	55.11	58.44	34.11
Videos	69.67	72.06	60.78
PowerPoint slides	71.83	69.41	76.94
In-class activities	72.41	60	72.94
Exit slips	75.94	64.82	66.29
Practice tests	N/A	77.29	68.18
Discussion forum	N/A	N/A	37

Although students considered lecture as the least helpful teaching practice in flipped learning, they would like to have more time for lecture in the class (Table 4). Lecturing in the flipped learning condition focused on answering students' questions on the lesson. However, students preferred traditional lectures that explained and illustrated basic concepts.

Table 4. Students' Comments on Flipped Learning

1. I did not like not having lectures.
2. I think it would help more if we can still have class lectures for this last section.
3. I didn't like how we studied for the last four chapters. I felt like we had to study all on our own with no help.
4. I did not like that the professor did not lecture during this last unit. Although group work helped, it wasn't as straightforward as a lecture explaining what everything meant.
5. I would much rather have lectures. When I take notes from reading & lectures it helps me to better comprehend the subject.
6. I did not like the way the last section of this course ended. I understand the teacher was trying new techniques, but it was hard to learn this on our own.

Discussion forum was considered not much helpful because it was optional for students to post to the forum. Since flipped learning was incorporated into the last four lessons after the

syllabus was finalized, none of the activities students were expected to prepare before the class were given any points. Most students did take the practice tests but did not post to the discussion forum.

Approach Taken to Improve Learning

From the results of the impact of flipped learning on students' performance in Fall 2014, I was motivated to flip all the lessons in General Educational Psychology in Spring 2015. My biggest struggle was whether objective tests should be used. Striving to be a constructivist teacher educator, I would like students to construct their own knowledge and such knowledge should not be objectified. However, I also believed that the construction of knowledge should be built on a solid foundation of basic concepts. To hold students accountable for learning the basic concepts, I used objective tests in the flipped classroom where instruction was shifted from classroom to students before the class. To make sure students had the opportunities to create their own knowledge, I kept the in-class tasks and field report for students to showcase the knowledge they had constructed.

Changes were made to how students prepared for the class and what students did during the class. First, practice tests were replaced by quizzes for students to show that they had read the PowerPoint slides and understood the basic concepts before the class. When students received points for taking the quizzes, they were held accountable for learning the basic concepts. Second, students did not only post to the discussion forum but also responded to others' postings. The social interaction among students in forum would facilitate students' construction of knowledge before the class. Third, students were asked to bring questions from their readings to the lecture for clarification. Instead of explaining every concept, lecture times would be used to clarify those concepts students found confusing and incomprehensible. Fourth, exit slips were replaced by real-life scenarios in individual and group tasks for students to explore the concepts in depth during the class. These tasks allowed students to construct their knowledge individually and socially.

Assessment of Impact of Change on Student Learning

Since flipped learning was used in all the lessons in General Educational Psychology in Spring 2015, I could not compare the impact of flipped learning with other learning conditions.

Instead, I used the four pillars of FLIP (flexible environment, learning culture, intentional content, professional educator; Flipped Learning Network, 2014) to develop a FLIP survey to investigate what students thought about how they prepared for the class and what they did during the class.

Flexible environment allows students to learn in a variety of learning modes (Table 5). Students liked reading the textbook, going over the PowerPoint slides, and watching video clips before the class; as well as completing individual and group tasks during the class. However, they did not like posting to discussion forum or taking a quiz before the class.

Table 5. The percentage of students responding "somewhat" and "very much" to a flexible environment

Flexible Environment	Do I like it?
1. Reading the textbook before the class.	64.29
2. Reading the PowerPoint slides before the class.	71.43
3. Watching video clips before the class.	71.43
4. Posting to discussion forum before the class.	42.86
5. Taking a quiz before the class.	42.86
6. Completing individual task during the class.	78.57
7. Participating in group task during the class.	85.71

Flipped learning promotes a student-centered learning culture (Table 6). However, students preferred the teacher-centered practices to the student-centered practices. Using direct instruction to cover the basic concepts was more favorable to students than using guidance to explore concepts in depth during the class.

Table 6. The percentage of students responding "somewhat" and "very much" to a learning culture

Learning Culture	Do I like it?
8. In-class time is dedicated to exploring topics in greater depth.	50
9. In-class time focuses on application of concepts.	64.29

10. In-class time is dedicated to cover the basics of topics.	71.43
11. In-class time focuses on direct instruction.	71.43

Intentional content determines what materials teachers need to teach and what students should explore on their own (Table 7). Students liked to explore the textbook, video clips and PowerPoint slides before the class. They also liked the lecture, and individual and group tasks during the class. However, they did not like posting to the discussion forum before the class.

Table 7. The percentage of students responding "somewhat" and "very much" to an intentional content

Intentional Content	Do I like it?
12. Textbook	71.43
13. Video clips	50
14. PowerPoint slides	64.29
15. Discussion forum	28.57
16. Lecture	57.14
17. Individual task	61.54
18. Group task	78.57

Professional educator is reflective in practice (Table 8). Students liked how the individual and group tasks were explained, assessed and observed. However, they did not like how feedback was given to individual and group tasks.

Table 8. The percentage of students responding "somewhat" and "very much" to a professional educator

Professional Educator	Do I like it?
19. The instructor explains the individual task.	71.43
20. The instructor assesses the individual task.	71.43
21. The instructor observes the individual task.	64.29
22. The instructor gives feedback to the individual task.	42.86

23. The instructor explains the group task.	85.71
24. The instructor assesses the group task.	78.57
25. The instructor observes the group task.	71.43
26. The instructor gives feedback to the group task.	50

Lessons Learned

The results of the FLIP survey gave me more information to improve the use of flipped learning for students to construct their own knowledge. Students liked how they prepared for the class and what they did during the class. However, students preferred to use direct instruction to cover the basic concepts and receive more feedback to the individual and group tasks during the class. They also preferred to take the quiz and discussion forum after the class.

When students are prepared before coming to the class, class meeting time can be better used to engage students in higher-level thinking and application activities. To improve students' understanding of concepts and motivate students to do more than the minimum requirements in this course, direct instruction is still needed to give an overview of the material, to explain confusing concepts, and to answer students' questions on their reading. Therefore, I would record my direct instruction with the PowerPoint slides for students to go over before the class.

Students did an individual task and a group task during the class to apply what they had learned to real-life scenarios or to analyze real-life scenarios with what they had learned. I reviewed the tasks with the class and gave verbal feedback to those who shared their responses. Since students preferred more feedback on their tasks, I would write individualized feedback on their work.

The quiz was designed to make sure students finish the reading before coming to the class. Since it was graded, students felt more confident in taking the quiz after the class. If I would like to continue using the quiz as a gatekeeper to make sure students are prepared for the class, I could give participation points to the quiz without grading it. If I would like to grade the quiz, I could allow students to take it after the class when they have a better understanding of the concepts.

The discussion forum seems to be disconnected to the other activities. The quiz, individual task and group task are connected to the textbook, PowerPoint slides, and the videos. The question in the discussion forum asks students to share their own experiences or opinions.

Students may not see the connection of their own experiences and opinions to what they have learned. If I would like to continue the discussion forum, I could revise the questions to better reflect the connection of what students have learned.

References

Flipped Learning Network (FLN). (2014). *The four pillars of F-L-I-P*. Retrieved from http://fln.schoolwires.net//site/Default.aspx?PageID=92