

# Results Summary of 2014 Pilot of Flipped Classroom Techniques

THE COLLEGE  
OF WESTCHESTER



SINCE 1915

*February 11, 2015*

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## Executive Summary

Over the course of 2014, flipped instruction techniques were utilized in 6 courses at The College of Westchester, in an effort to assess this increasingly popular instructional methodology. The techniques were applied limitedly – the expectation was that 30% to 50% of the course material would be delivered using flipped teaching and learning methods.

Results were assessed both qualitatively and quantitatively. A survey tool was used for qualitative assessment, and students responded positively, with 85% indicating that they liked the approach and 76% indicating that the approach helped them learn better. Final grades were used for qualitative assessment, and a positive finding in this regard was that instances of “DFW Grades” (grades of D, F, or Withdrawal) occurred an average of 14.5% less often in the flipped courses than they did in same-shift offerings of these courses during the prior two-year period.

While it is difficult to directly correlate the quantitative findings to the specific teaching methodology, the decrease in DFW grade rates and the positive student feedback would appear to offer a strong indication that this is a technique worthy of further exploration and pursuit.

## Background

Having seen increasing data supporting the effectiveness of flipped teaching and learning techniques throughout 2012 and 2013, CIO Kelly Walsh approached Provost Warren Rosenberg seeking to develop an approach that would encourage faculty at The College of Westchester to trial the flipped classroom in a structured pilot.

Provost Rosenberg suggested the use of a Competitive Grant to enhance interest. This led to the allocation of two grants of \$1,000 each for two applicants to be selected through a proposal process. Several CW Instructors submitted proposals for the “Flipped Classroom Competitive Grant”, which was targeted to those who would be teaching courses in the Winter Day 2014 Term. Proposals from Dr. Christopher Nwosisi and instructor Alexa Ferreira were accepted based on their merit and various criteria.

This initial work was deemed “Phase 1” of the institution’s assessment of flipped teaching and learning, with the intention of expanding on this should the results of the first phase prove encouraging. Indeed, both the Quantitative and Qualitative results from Phase I were very encouraging. Average grades increased, and even better, DFW rates significantly decreased. Qualitative findings were also encouraging as 94% of students in this initial group responded that they liked this approach to learning and 72% indicated that this approach “Helped [them] learn the material better”.

The effort was then extended with a Phase 2, in which 4 course offerings were similarly flipped, including one Evening course, comprised of mostly adult students.

It should be noted that with each of these course “flips”, it was required that 33% to 50% of the course content be delivered using flipped instruction techniques (as opposed to requiring the majority of content to be flipped, given that these are initial forays into this technique). Instructors were required to document their planned approach in order to be eligible for inclusion in the study.

## The Academic Approach

The instructors were required to define and document their approach to using flipped instruction techniques in selected courses. Some chose to flip roughly every other week’s content, while others flipped specific lessons, or to partially flip one lesson a week. A variety of digital learning materials (videos, podcasts, docs, web-based tools) were to be consumed outside of class, coupled with in-class exercises, projects, collaborative group work and work on assigned labs, individually and in groups. This was a purposeful change to how class time was being used. A key goal and benefit of using flipped teaching methodologies is using class time to provide a more student-focused, personalized learning experience, incorporating increased use of active learning methods (*University of Washington*).

### Flipping *Cisco Networking Basics*

Dr. Christopher Nwosisi shared some of his motivations and reasons for trying flipped teaching and learning in this particular course in a presentation made to the faculty at the college in June.

- This is a foundation course of the four series of Cisco Networking courses that is required for obtaining the Computer Networking Administration degree.
- Some students are weak in problem solving skills
- Some weaker students have difficulties understanding concepts and cannot follow the lesson as they should
- Instructors have less time in class for coaching

Dr. Nwosisi felt strongly that this was a course in which mastering the concepts would be better enabled by more collaboration among students, more hands-on work in the classroom, and having the Instructors available to assist. Prior to trying ‘the flip’, students would often have to work on lab assignments outside of class.

Under the partially flipped model, the lesson plans for every other week were changed to incorporate the use of videos and an audio lecture to deliver content, coupled with required participation on a Discussion Forum (as a means to help ensure student engagement in the content). Online Quizzes were also used as a means of confirming student consumption of content, and assessing their understanding of the content.

With the learning content delivered outside of class during these ‘flipped weeks’, class time could then be devoted to letting students complete the labs that are vital to developing an applied understanding of the course content. Students worked on the lab work in groups, independently, and/or with the instructor, at different times, and according to their preferences and needs.

### ***Flipping Adult Development in the Workplace***

This elective course is for first semester BBA students, that is – students who are transitioning to a new level of scholarship in their Junior Year. Instructor Alexa Ferreira notes that students “Students typically have presumptions about the topic (adulthood = middle age = old age = decline) which make them feel it is useless to study it”.

Ferreira’s approach to flipped lessons included a full cycle of learning activities, starting with an introduction of the topic in the classroom, followed by consuming of learning content at home and reinforcing activities, and as assessment in class.

Learning activities outside of class included a mix of readings, videos, and engaging interactives like the “Longevity Game” (on online game-style tool that estimates how long you will live) or an Interactive Longevity Map. In this particular lesson example, students would work in the following class session to design an educational intervention program targeted toward older adults.

Some of the benefits of the flipped approach cited by Ferreira included:

- Encourages and furthers the use of multiple teaching modalities
- Gives students numerous chances to succeed
- Increases participation and engagement

### ***Flipping Emerging Information Technologies***

This introductory course is a required “gateway” course for all new students. The goal of the

course is give students a solid introduction to the ways that businesses and organizations are using information technology.

In one of the flipped sections of the course, instructor Kelly Walsh used the WSQ Technique (short for “Watch, Summarize, Question) once a week to introduce a new topic. Students were assigned homework in which that would view the provided materials (typically a couple short videos), write a brief summary about what they watched, and then also write at least one relevant question.

Some benefits of this technique include:

- The use of this technique commonly helps to ensure that students engage the material.
- Students come to the next class prepared to explore the topic further.
- It supports a cycle of learning activities. The topic gets introduced briefly prior to them having to consume the content. After they complete the assignment, we can review their observations and questions, and then undertake in-class work to further explore the topic and reinforce learning.
- It also provides opportunities for writing and writing assessment.

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## The Assessment Approach

Quantitative and qualitative assessment techniques were designed and incorporated in the study.

### **Qualitative Assessment Approach**

Qualitative assessments are based on a survey of student perceptions, and instructor perceptions of the course and the flipped class delivery method.

### **Quantitative Assessment Approach**

Quantitative assessment techniques include a comparison of final grades in the piloted partially flipped course to average grades and completion rates in prior offerings of the same courses. Results are to be compared to prior offerings of the course over the preceding two year period (2012 – 2013).

The focus of these assessments is to compare outcomes using two metrics, as follows:

- **Average Non-DFW grades:** The Average of grades above D will be used as a comparative assessment element for the purposes of this study. F Grades and Withdrawals are clearly failures as Learning Outcomes. Similarly, D grades can also be counted as such, as they are below the 2.0 threshold required for degree completion, and they would not transfer to other institutions. Other academic assessments have used this ‘DFW’ construct (*Fusch*).
- **DFW Rates:** The rates of students achieving D’s or F’s, or Withdrawing, will constitute another vital metric in the assessment of the effectiveness of flipped instruction techniques as a tool to improve learning outcomes.

## Summarizing Findings

Both Quantitative and Qualitative results from the Partial Flipped Class Pilot have been encouraging. DFW rates decreased by over 14% on average, and from a qualitative perspective, 85% of students responded that they liked this approach to learning and 76% indicated that this approach “Helped [them] learn the material better”.

### Quantitative Assessment #1 – Average Non-DFW Rates

5 of 6 flipped classes experienced higher average rates in the A to C- range, and the average grade rose by about 2%. This was not a statistically significant change.

***See Appendix B for further details.***

### Quantitative Assessment #2 – Average DFW Rates

An exciting result of the Partial Flipped Class pilot is the reduction on DFW rates. Five of the Six classes experienced lower rates of D and F grades and Withdrawals. On average, there was a 14.5% decrease in DFW rates across the 6 courses offered, when compared to average rates for all same-shift offerings of the courses during 2012 and 2013.

Reductions in DFW Rates are a powerful and encouraging result. Grades of D, F, or Withdrawal play a significant contributory role in failure to retain and ultimately graduate. A technique that can consistently reduce DFW Rate occurrence is certainly worth further exploration and pursuit.

***See Appendix B for details on the Quantitative Assessments.***

### **Qualitative Assessment #1: Student Perceptions Survey**

5 Questions were asked on this survey, to gauge student's thoughts on how the flipped delivery method affected their learning. Response options for each question were as categorized follows: Strongly Agree, Agree, Neither Agree nor Disagree, Disagree, and Strongly Disagree. Responses were summarized into 3 groups (by combining "Agree" and "Strongly Agree" responses, and "Disagree" and "Strongly Disagree" responses).

#### **Question No. 1: "I liked this approach to learning"**

The vast majority of students (85%) selected "Agree" or "Strongly Agree" for this question!

#### **Question No. 2: "This approach helped me learn the material better"**

76% of students, a significant majority, agreed that the flipped instruction approach helped them learn the material better.

#### **Question No. 3: "This approach required more work"**

Half of the students felt that flipped teaching and learning did require more work, which is not surprising as it often can.

#### **Question No. 4: "I would want more of the material in the course taught this way"**

67% of students answered in the affirmative on this question.

#### **Question No. 5: "I would want other courses to use this approach to learning"**

62% of students Agreed that they would want other courses to use this approach to learning.

These results are all quite supportive of the use of flipped instruction techniques in their learning experiences.

***See Appendix B for further details of the Quantitative Assessments Results.***

## Teacher Perceptions of Flipped Instruction

We also surveyed the teachers for their feedback on their work with flipped instruction. Here is some of the feedback they provided:

### Did you find that using flipped class techniques helped your students learn better?

- “It did because it made them pay more attention and be more engaged during class time.”

### What did you like the MOST about teaching using flipped class techniques?

- “Students' collaboration and interactions among themselves.”
- “I liked to see the students chatting excitedly about the in-class activities. I loved to see them laugh and to hear them really thoughtfully engaging the material.”

### What did you like the LEAST about teaching using flipped class techniques?

- “It is difficult to find academically rigorous pre-classwork that isn't just reading. Much of what is available online is not college level. It is also difficult to get them to actually do the pre-work.”

### Is there anything you would plan to do differently if you do this again in future classes?

- “As per the students' suggestions, I will have an introduction of the topic material before the flipped class.”
- “This style demands tremendous pre-planning, so I would do even more of that. I would also re-think the way I would organize my Moodle [the college's Learning Management System] to make it optimally navigable for the students.”

### Will you use Flipped Class techniques in future classes?

- “I definitely will. I think it creates a more interactive environment and it also supplies the multi-modality approach that speaks to different learning styles or even to challenges faced by ESL students.”

## Bibliography

Fusch, Daniel. "DFW Rates and You: Rethinking Support for At-Risk Students." 12 October 2012. *Academic Impressions*. <<http://www.academicimpressions.com/news/dfw-rates-and-you-rethinking-support-risk-students>>.

University of Washington. "Flipping the Classroom." n.d. *Center for Teaching & Learning - University of Washington*. 30 June 2014. <<http://www.washington.edu/teaching/teaching-resources/flipping-the-classroom/>>.

## Appendix A – Quantitative Results

### Grades & DFW Rate Comparisons

6 Piloted Partially Flipped Courses vs. Non-Flipped Prior Offerings of Same Course

	Average non- DFW Passing Grades	Average DFW Rates	
NET125 - All 2012 - 2013 Day Offerings	82.5	40.8%	
NET125 - 2014 Day Flipped Class	88.3	9.1%	
NET125 - All 2012 - 2013 Evening Offerings	88.4	23.8%	
NET125 - 2014 Adult Flipped Class	86.4	20.0%	
OFT115 - All 2012-2013 (Day) Offerings	88.7	20.9%	
OFT115 - (Two) 2014 Flipped Day Classes	90.5	19.6%	
GEN330 - All 2012-2013 (Day) Offerings	87.0	15.9%	
GEN330 - (Two) 2014 Flipped Day Classes	88.3	23.3%	
<b>ALL PRIOR COURSES COMBINED</b>	<b>86.9</b>	<b>24.1%</b>	
<b>ALL FLIPPED COURSES COMBINED</b>	<b>88.9</b>	<b>20.6%</b>	
<b>% Improvement</b>	<b>2.3%</b>	<b>14.5%</b>	<b>% Decrease</b>

5 out of 6 Courses Experienced an Increase in Average Non-DFW Grades\*

5 out of 6 Courses Experienced an Decrease in Average DFW Rates\*

*\*(when compared to average grades over 2 years of prior offerings in the same shift)*

## Appendix B – Qualitative Results

QUESTION	Agreed	Disagree	Neutral
I liked this approach to learning	85%	5%	10%
This approach helped me learn better	76%	7%	17%
This approach required more work	50%	17%	33%
I would want more of the material in the course taught this way	67%	17%	16%
I would want other courses to use this approach to learning	62%	17%	21%



