

Data Brief



October 2014

Danville Area Community College

Volume 4, Issue 1

ACHIEVING THE DREAM (AtD) is on the move at Danville Area Community College!

This Data Brief focuses on recent changes made in the Mathematics Department so that students have a better chance to succeed in coursework leading to college level math courses.

Flipped Classrooms

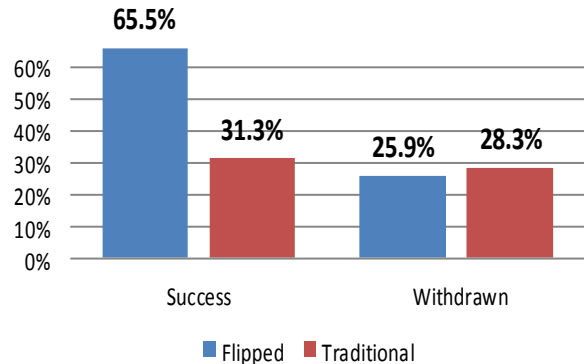
Over the past few years' Intermediate Algebra, MATH 105, instructors have been studying the use of the Flipped Learning classroom model. While in the traditional classroom model students are presented material during class time which is followed by an assignment done outside the classroom, in the flipped model students are presented new material outside the classroom and work on their assignments during class time.

At DACC, this has meant creating video explanations as well as assembling other tools for students to use so that the course material could be learned outside the classroom setting.

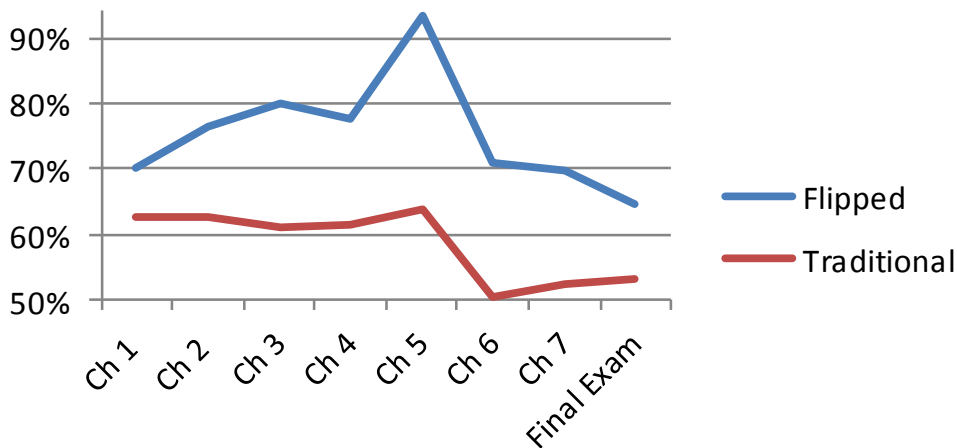
Now, the classroom focus is on mastery of the material by doing. Students work in cooperative groups, with assistance from their instructor, to complete problems assigned to increase the students' skills and eventually master associated course outcomes.

While piloting the flipped classroom at DACC over past semesters, it became apparent that students in the flipped classroom sections were having more success than those being taught through a more traditional approach.

Student Success in MATH 105 by Instruction Method



Student Test Averages in MATH 105 by Instructional Method





Average test scores for these students were anywhere from 7.7% higher to 29.7% higher than traditionally taught students, including a difference of 17.1% for the semester final exam.

Although the percentage of students who withdrew was comparable, 25.9% for flipped and 28.3% for traditional, the percentage of students who succeeded with a C grade or better in the flipped classroom was more than double that in the traditional classroom, at 65.5% compared to 31.3%.

As the pilot was considered a success, starting this Fall 2014 semester all Intermediate Algebra sections are using the flipped classroom model.

MATH BOOT CAMP

DACC algebra instructors noticed that some students were struggling by missing select skills that they are expected to have mastered before entering the algebra classroom. To assist students who have these gaps in knowledge, this summer, the DACC mathematics' instructors have put together a Math Boot Camp.

In the camp, participating students have a chance to firm their skills in areas such as fraction multiplication, integer subtraction, and exponents properties along with being given study tips so they have necessary skills to succeed in algebra.

The boot camp is offered to students registered in MATH 101, MATH 105, and MATH 107 to be taken before the class begins or in the first couple of weeks of the semester. The Boot Camp is offered on Blackboard, and instruction is given through a series of videos, link, and examples, followed by a review activity often in game form.

So students know they understand the material, they have frequent practice tests as well as a few unit tests. With successful completion of the Math Boot Camp, students are allowed to retake their placement test and possibly test into a higher math course.

Although testing out of a math course may be a giant carrot which attracts students to the Math Boot Camp, reviewing these topics before entering their algebra course has great benefit to participating students. As well with the boot camp under their belts, students can focus on learning the algebra and have less distractions from gaps in their arithmetic knowledge.

NEW COURSE:

APPLIED MATHEMATICAL CONCEPTS

This fall, the Mathematics Department is offering a new course, MATH 107 Applied Mathematical Concepts. This six credit course is open to any student who needs statistics and placed into Basic Algebra or Intermediate Algebra. Students who need both courses and later Statistics can take MATH 107 and accelerate their math sequence to complete the sequence in two rather than three semesters.

Although having many similar concepts to the aforementioned algebra courses, Applied Mathematical Concepts is more founded in practical applications using extensive problem solving examples. In the classroom, cooperative learning is used as students learn new concepts and how to analyze situations as a team.

Outside the classroom, assigned problems are given in four categories: (1) skill practice, done through the artificial intelligence assessment and learning system ALEKS, (2) technology infusion, practicing their newly learned skill in Excel or some other tool, (3) application, which is a direct extension of the day's lesson, and (4) reflections, so students can express their thoughts of the lesson material.

Compared to Basic and Intermediate Algebra, the Applied Mathematical Concepts course is more problem based and verbally challenging. The course is described as not for those interested in College Algebra as some algebra concepts taught in Intermediate Algebra are not covered as in depth in this new course. Nursing students who may at a later date wish to take statistics are encouraged to take the course for the focus on reasoning, problem solving, and teamwork.

DACC is currently offering six sections of MATH 107, including one in the evening and one at the Higher Education Center in Hoopeston. Although new, instructors are considering ways to measure the effectiveness of the course in hopes that it continues to meet students needs.