Course Redesign at Pierce College: What Works and What Still Needs Work

CMC^3 South
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Kathy and Bruce Yoshiwara

yoshiwka@piercecollege.edu
yoshiwbw@piercecollege.edu

Summary of Developmental Math ReDesign

- **Current Programs**
  - **MAP** (Modeling and Algebra Project for Algebra 2)
  - **ASAP** (Combined Algebra 1+2 Immersion)
  - **STATWAY** (2-semester Statistics for non-STEM)
- **Future Pilots**
  - **APT** (Accelerated Precalculus and Trig)
  - **PI** (Prealgebra Immersion)

MAP: Modeling and Algebra Project (Algebra 2) Overview

- Since Fall 2007 (5 years), 3 sections this semester
- Pedagogical approach:
  - Discovery/directed learning activities stress critical thinking
  - Less lecturing, more group work
  - Reading questions due before class
  - Concept questions with clickers
  - In-class tutor
- Custom course materials
  - Developed by Pierce faculty
  - Integrated textbook/workbook
  - Videos of problem solutions
  - Online homework
  - Toolkit for review material

MAP Successes

- High scores on MET (Average score 64.2 vs 52.6 for all Algebra 2)
- Success and retention comparable to average for Algebra 2
- Reading Questions encourage students to read before coming to class
- Activities and Concept Questions engage students
- Focus on applications increases writing ability and critical thinking without detracting from mastery of skills

MAP Challenges

- Many students in class are not level prepared – makes discovery harder than it needs to be
- Students resist the idea that the discovery "struggle" approach is better for them than the lecture method they are used to
- Students are easily discouraged by challenging material – requires lots of pep talks

ASAP

- Algebra Success At Pierce – Get through your algebra classes ASAP!
- Learning-community-style cohorts
- Course has four components:
  - Algebra 1 (5 units),
  - Algebra 2 (5 units),
  - Math study skills unit (1 unit),
  - College success class (1 or 3 units)
  - Total units: 11 or 14

ASAP Materials

- Custom book blends Algebra 1 and 2, minimizing repetition
- Directed learning activities stress critical thinking
- Emphasis on graphical reasoning and applications
- Rule of four: verbal, numerical, graphical, and algebraic descriptions of models
- Graphing Calculator
- Clicker questions explore concepts
- Study Skills booklet

Support for ASAP

- Supplemental Instruction leader for each ASAP community (5 communities this semester)
- SI leaders funded by BSI funds for 13 hours per week – 5 hours in the classroom and 8 hours outside running study group sessions
- College success companion course taught by a counselor
- Counselor and Math instructor meet on a regular basis

SUCCESS IN ASAP: SP'08–SP'10

	Math 125 Success		
ASAP Status	Not Successful	Successful	Grand Total
ASAP	50	100	150
	33.33%	66.67%	100.00%
Non-ASAP (Alg 2)	2196	2502	4698
	46.74%	53.26%	100.00%
Total Count	2246	2602	4848
Total Proportion	46.33%	53.67%	100.00%

Note: Success rate of passing BOTH Algebra 1 and Algebra 2 (in two semesters)is normally about 25%.

ASAP Success at Transfer Level

	Algebra 1			Algebra 2				Transfer Level			
	Enrolled	Successful	%	Enrolled	%	Successful	%	Enrolled	%	Successful	%
ASAP	463	325	70%	323	70 %	28 8	62 %	105	23 %	55	12%
Non-ASAP	531 4	304 6	57%	168 9	32 %	11 53	22 %	494	9%	374	7%

ASAP: Why combine?

- Immersion means students have less time to forget material from class to class.
- Eliminates overlap of Algebra 1 & 2—more time to shore up basics & delve deeper.
- Community building through SI and counseling support
- Student attrition over two semesters is diminished
- More is at stake—failing 5 units might be no big deal, but failing 14… ouch!

Statway

- Two-semester course for non-STEM majors
- Students eligible for Algebra 1 complete a college level statistics course in one year
- Program designed by the Carnegie Foundation, currently in its pilot year
- In-class Lessons: Activities demonstrate the new concepts and skills
- Out-of-Class: Students work on MyStatway, a computer text and tutorial

PI: Prealgebra Immersion

- Six to nine 1-unit modules
- In-class directed learning activities (EMPower Math booklets)
- Online skills practice
- Students can test out of any module
- Students must pass all modules for entry into Algebra 1

A Vision for Future Math Pathways at Pierce

- **PI** (Prealgebra Immersion)
  - For all students who place below Algebra 1
  - Modular 1-unit courses
- **STATWAY**
  - For Humanities/Social Science students
  - 75% of all Pierce Algebra 1 students
- **ASAP**
  - For STEM, Business, Nursing
  - 25% of all Pierce Algebra 1 students
- **APT** (Accelerated Precalculus and Trig)
  - For students headed to Calculus
  - Trigonometry and Precalculus in one semester

Wrap-up: What Works

- Careful construction of curriculum content and design
- Directed learning activities
- Mastery learning
- IMMERSION!
- The Empirical Approach to Redesign: Try different things! Keep what works; learn from what doesn't

Pierce college Math course redesigns

- For info about the materials contact

Kathy Yoshiwara, Math faculty
Bruce Yoshiwara, Math Chair

yoshiwka@piercecollege.edu
yoshiwbw@piercecollege.edu