



COURSE REDESIGN AT PIERCE COLLEGE: WHAT WORKS AND WHAT STILL NEEDS WORK

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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%	288	62%	105	23%	55	12%
Non-ASAP	531	304	57%	168	32%	1153	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

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