

## Action Project

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**Institution:** Seward County  
Community College

**Submitted:** 2007-11-14      **Contact:** Cynthia Rapp

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### Timeline:

Planned project kickoff date: 10-01-2007

Target completion date: 08-31-2008

Actual completion date: --

A. Give this Action Project a short title in 10 words or fewer:

Mapping Conceptual and Skills Mastery in Developmental Mathematics

B. Describe this Action Project's goal in 100 words or fewer:

The department will continue work to determine what conceptual mastery will be emphasized in each developmental math course based on curriculum mapping of content, skills, and assessment, to increase the success rate of students, including those who earn a C in a prerequisite course.

C. Identify the single AQIP Category which the Action Project will most affect or impact:

Primary Category: Helping Students Learn

D. Describe briefly your institution's reasons for taking on this Action Project now -- why the project and its goals are high among your current priorities:

Many SCCC students arrive underprepared to do college level work in mathematics and therefore require developmental education to increase their chances of success in college level courses. A previous Action Project identified possible problems in course curriculum and sequencing and in success rates of students who earn a "C" in the previous course. Curriculum mapping is an essential next step in identifying strategies that support a successful transition from one developmental math course to another.

E. List the organizational areas - -institutional departments, programs, divisions, or units -- most affected by or involved in this Action Project:

Mathematics Department Academic Affairs Council: Developmental Education & General Education Information Technology Department: Data collection

F. Name and describe briefly the key organizational process(es) that you expect this Action Project to change or improve:

Curriculum sequencing Data collection Advising Assessment of student learning Enrollment Process

G. Explain the rationale for the length of time planned for this Action Project (from kickoff to target completion):

This project will be done primarily by the mathematics faculty. There will be time issues due to ongoing classes and difficulty in meeting more than once a week through the fall and spring semesters. Core conceptual and skills competencies will be identified and mapped for each

developmental math course leading to and including College Algebra. Success rates of two groups of College Algebra students will be compared: students appropriately placed in the course and those who are attempting the course after waiving placement recommendations for developmental courses.

H. Describe how you plan to monitor how successfully your efforts on this Action Project are progressing:

The following will be reported at the monthly AQIP Steering Committee meeting: • Progress on the mapping and the analysis of the curriculum maps. • The comparison of success rates for students who follow placement recommendations to those who do not follow them. Bonnie Mautz and Luke Dowell are co-leaders on this action project, and Bonnie Mautz is also a member of the Steering Committee.

I. Describe the overall "outcome" measures or indicators that will tell you whether this Action Project has been a success or failure in achieving its goals:

1. Completion of the curriculum maps and analysis of core conceptual and skills competencies for each course, including where in the sequence mastery should take place. 2. College Algebra success rate comparisons between the student cohort following placement recommendations and the student cohort that does not follow placement recommendations.

J. Other information (e.g., publicity, sponsor or champion, etc.):

Bonnie Mautz, Mathematics Department Luke Dowell, Mathematics Department Troy Bowles, Mathematics Department Brad Kearn. Mathematics Department Frances Brown, Developmental Math Todd Carter, Division Chair

K. Project Leader and contact person:

Contact Name: Bonnie Mautz, Mathematics Instructor

Email: bonnie.mautz@sccc.edu

Phone: Ext.

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### **Annual Update: 2008-09-08**

A. Describe the past year's accomplishments and the current status of this Action Project.

The project leaders, Luke Dowell and Bonnie Merrihew, met weekly to discuss competencies for each course. Basic Arithmetic is taught through the developmental education department. The project leaders met with the instructor to discuss the competencies for that course in order to line up the competencies in the resulting courses. Competency lists have been evaluated for Basic Arithmetic, Advanced Arithmetic, Beginning Algebra, Intermediate Algebra, and College Algebra including:

- a. editing lists to include all topics currently taught in the courses as well as deleting topics we no longer cover.
- b. editing the format of the lists so they are uniform.
- c. comparing SCCC competencies to state core competency lists for each course.
- d. identifying competencies that need to be mastered in each course to be successful in the next course. (We required mastery if it is the second time they have been through the material in the

SCCC math sequence.

e. developing competencies independent of any textbook.

The first draft of the competency list is finished with the above mentioned criteria. We are currently looking at “filling the gap” between Beginning Algebra and Intermediate Algebra by adjusting mastery competencies for Beginning Algebra. Since it is a “beginning” course in algebra the material is very new to students. If we use the idea of mastery as being the second time they engage the material then there are not many algebra competencies we can declare as mastery competencies. We are adjusting criteria for this course to include foundational competencies the student should master even though it is the first time they may have encountered the competencies in an algebra context.

Assessment strategies include:

- a. A pretest which will be given the first week of class in each course to determine whether a student is ready for the course in which they are enrolled. One exam is given to all math students from Advanced Arithmetic to College Algebra (our own “in house” placement test). When students are placed in a math class using COMPASS or ACT we generally don’t know their level of knowledge until after the first exam. Many times this is too late to move them to the appropriate class (higher or lower level).
- b. “On-campus” common final exams which will be created in each of these courses having the mastery competencies well identified. These competencies would be graded using a generalized math rubric that would apply to all problems. The results for different problem types would then be tracked to determine which topics need more detailed instruction.
- c. After enough data is collected we should be able to establish benchmarks that determine how many and which competencies will need to be mastered in each course to predict success in the next course in the mathematics sequence.

**Review ():**

**B. Describe how the institution involved people in work on this Action Project.**

Once the math instructors that served as project leaders had a draft of the course competencies as well as the competencies that needed to be mastered in each course, they were presented to the rest of the math faculty for review and editing.

Progress on this action project was communicated to the AQIP Steering Committee during meetings throughout the year. It was also presented to the Academic Affairs Council so they would be aware of some of the changes made to the mathematics curriculum starting in the fall semester.

This AQIP Action Project was also an action project on the mathematics program review. This is one component of our plan for improvement.

**Review ():**

**C. Describe your planned next steps for this Action Project.**

We will pilot the in-house placement test in the 2008-2009 academic year by giving it to all students in courses from Advanced Arithmetic to College Algebra. The results will be recorded and compared to their final grades in each course. These results will be used to evaluate the test

for effectiveness in determining placement for students. Adjustments may be made before the pretest is used in the following school year.

Common final exams will be written for each course to emphasize the competencies the students need to master before moving to the next course in the sequence.

Student success will be tracked in successive semesters to determine benchmarks for both the in-house placement test and the common final exams.

**Review ():**

D. Describe any "effective practice(s)" that resulted from your work on this Action Project.

The communication between faculty teaching mathematics was beneficial. The collaboration needed to determine which competencies are to be mastered in each course was essential for the project.

From this process evolved some strategies we will be piloting in the coming year. The procedure of aligning course competencies, developing an in-house placement test and collaborating on common final exams may be useful to other institutions.

The process the math faculty utilized to fill the gaps between the math courses may be of interest to other institutions:

- The math faculty discovered gaps in the math curriculum by looking at success rates of students who received a C or better in the prerequisite course.
- Two possible causes for the gaps were considered including curriculum misalignments and misidentifying whether a student exiting a prerequisite course is prepared for the next course in the sequence.
- The math faculty collaborated on the alignment of the math sequence by analyzing competencies for all math courses. A mastery competency is any topic covered twice in the math sequence.
- After the alignment was corrected, the competencies were used to construct an in-house placement test that will be piloted in the fall of 2008. This test will be given to all math courses from Advanced Arithmetic to College Algebra.
- Data will be collected which will track correlations between the score a student earns on the placement test and their success in the course.
- Common final exams will be written for each course that will emphasize the competencies that the students need to master before moving to the next course in the sequence. A generalized math rubric will be used and the results will be tracked to determine the problem topics.

**Review ():**

E. What challenges, if any, are you still facing in regards to this Action Project?

Students enter SCCC with very different academic backgrounds in mathematics. It will be a challenge to implement and analyze an in-house placement test that can be used in conjunction with standardized placement instruments, high school/GED transcripts, and Critical Student Inventory data in our advising process. Our goal is to provide accurate and compelling placement information so that students can make informed decisions when it comes to enrolling in the course that best fits their needs. Procedures will need to be developed for those students that

don't place into the course they want but insist on taking it.

Determining what data needs to be analyzed to make this process successful will be a challenge. We will be utilizing the newly created Office of Institutional Research on our campus for advice on what data to collect and assistance in collecting and analyzing the data.

It will be a challenge for our mathematics instructors to emphasize the mastery competencies instead of following the textbooks they use for their courses.

Once this process is finalized on campus another challenge will be implementing it into our Outreach classes as well as any classes taught by adjunct instructors.

**Review ( ):**

F. If you would like to discuss the possibility of AQIP providing you help to stimulate progress on this action project, explain your need(s) here and tell us who to contact and when?

**Review ( ):**