Assessment Summaries 2009
Division: Mathematics

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Based on your assessment efforts, what changes has your division made to increase student success and student learning?

Many of these changes listed below are in the exploratory phase. Data is in the process of being gathered to guide modifications and improve student success.

COLLEGE ALGEBRA:

Math 111 Problem Solving Assessment – Since Winter Term 2001 the Mathematics Division has administered at least four common questions on final exams in Math 111 and kept data on student success in meeting some of our course outcomes. Participation by instructors incorporating common exam questions in their finals has been optional, but we have generally had at least 50% of the course sections represented in any given term. Over the years we have recognized that a consistently challenging outcome for students to meet is problem solving. For example, on the Spring 2006 common final exam questions, which focused on problem solving, the average score was only 59%. In response to this data, in Fall 2006 the Math Division applied for and received supplemental instruction curriculum development funds to create a Math 199 course linked to Math 111. This course will focus on collaborative problem solving and will be offered as a pilot during the 2007-2008 school year. Goals include helping our students be more successful in Math 111 (where the success rate has been below 77%) and beyond, and helping students fulfill the "think critically and solve problems effectively" core outcome for general education.

MTH 111 Value-Added Assessment – The Math Division began administering pre and post tests in MTH 111, Spring 2006. The tests focus on basic algebra concepts that students should have coming into MTH 111. We plan to use the data to determine if we need to supplement the course with more review materials and to give students immediate feedback on their readiness for the course.

MTH 199 Supplemental Instruction – In 2007/08, our pilot course, MTH 199 Supplemental Instruction: Problem Solving for College Algebra was offered. Concurrent enrollment in MTH 111: College Algebra is required. In Math 199, students strengthen their understanding of college algebra through collaborative problem solving as members of a math learning community. Over the year, 69 students enrolled. The combined retention rate was 78% and the success rate was 71%. Given this was an optional offering for students who were striving for better understanding of college algebra, the results were encouraging.

In fall 2008, the MTH 199 committee met to discuss the fate of the class. Based on feedback from instructors and students, it was decided that Math 199 should be a regular offering. The plan for 2009/10 is to pursue renaming the course and gain approval through the Oregon State Math Chairs (for courses 100-level and above) and Lane's

curriculum committee. We will continue to solicit student feedback and monitor completion and success rates for this course and for MTH 111.

DEVELOPMENTAL MATH:

Retention Task Force – The Math Division is using IRAP data to track students and plans to pilot a section in Math 060 or 095 in Fall 2007 that will target community populations or groups under-represented in the STEM disciplines.

In Winter 2008 MTH 060 Multicultural was offered, then in 2008/09 the pilot was extended to include MTH 065, and 095 as well. Enrollment in these courses has been weak. Also, since the courses are attended by all students, tracking of completion and success of under-represented groups in these courses is not available.

In an effort to engage students and strengthen outreach, the Math Division is funding a student math tutor who works in both the Multicultural Center and the Math Resource Center. We are tracking the success of this offering through end-of-term discussions between the designated math tutor, MRC director, and dean.

Flexible Sequence Algebra (FSA) Math 095—During school years 2005/06 and 2006/07, both student and instructor feedback have been used to make improvements to the course. For example, this year we have changed the course from five meetings per week to three meetings per week to better accommodate student schedules. We have also changed the online testing structure to make it more flexible for students. In addition, instructors who teach FSA MTH 095 work in teams on course assessment and appropriate modifications. In this last phase of our FIPSE grant we are attempting to identify the most effective features of FSA in order to incorporate them more broadly in many of our course offerings, particularly developmental algebra.

FSA Wrap-up
In 2007/08, the Math Divsion completed a two-term extension (beyond the extension year) of the $400,000 FIPSE grant which funded the FSA MTH 095 courses. In this last year, studernts who had previously enrolled in FSA were able to return and complete their coursework. This improved the overall success of the FSA program and inspired modifications to existing self-paced courses in our Math Resource Center (MRC).

MRC MTH 095 Course –In Spring term 2008, the MRC began offering MTH 095 in the self-paced format, while phasing out the MTH 090 self-paced course. The change was in response to student demand for MTH 095 in an alternative format to the traditional classroom and the reduced need for MTH 090. This new MTH 095 course is delivered using MathXL, an online course management, skill practice and testing tool that corresponds to the textbook. The FSA course modularization and computerized testing influenced the format of this course as well as MRC MTH 020, 060, and 065.

Developmental Math Task Force – As of 2007, the Math Division was in the process of phase one of a comprehensive review of our developmental math curriculum. The

Developmental Math Task Force was undertaking the review with the purpose of identifying areas of consensus about which aspects of our program need improvement orenhancement. The Delphi process undertaken engaged Mathematics staff in conversations of "what really matters" (i.e. the factors that directly impact student success, retention, and the ability of students to take what they learn and transfer that to other aspects of their lives).

Combined Text for Developmental Algebra – The Math Division has adopted a combined textbook for the Developmental Algebra course sequence (Math 060 through 095). The need to smooth the transition between these courses was identified through conversations within the division (including those within the Developmental Math Task Force meetings) and fueled by several developments: an increase in enrollment of vocational/technical students in these courses; a change in the math requirement within the Nursing Program from Math 052 to Math 095; and the requirement of Math 095 for the Physical Therapist Assistant Program. Funding from the Unit Planning process was provided for course lead faculty to complete most of the work of aligning the text with course curriculum in Summer and Fall terms 2008. IRAP data will be used to track impact.

Math Fast Lane Learning Community – The Math Division participated in the creation and piloting of the Math Fast Lane Learning Community which linked MTH 060 and 065 to College Success and Effective Learning, respectively. Math Fast Lane is a product of the First Year Experience committee charged with increasing student engagement in the first year of college. The pilot for MTH 060 and CG 100 in Fall 2008 had strong enrollment. However, enrollment for MTH 065 and EL 115 was initially weak, leading to the cancellation of EL 115 and then MTH 065. Next year we plan to offer Math 060 with CG 100 in both Fall 2009 and Winter 2010. IRAP data will be used to track completion and success.

MTH 025: Basic Math Applications Learning Community –A new version of MTH 025 with an emphasis on math related to the culinary arts was developed to improve the success of culinary arts students in MTH 025, which is a required course. Content and a textbook were determined in meetings between MTH 025 instructors, the Math Division Chair, and staff in the Culinary Arts and Food Service Management program. The course was first offered in Fall term 2007. The completion and success rates were 94% and 83% respectively. We'll continue to track this offering with data from IRAP.
CLASSROOMS:

"Smart Classrooms" **–** The College has upgraded most of the general use classrooms that the Math Division utilizes in Building 16 to "Smart Classrooms". These upgrades were requested through our Unit Planning process and funding was provided by Student Tech Fees over the last four years. The Division has offered two colloquia each term as a venue for faculty to assist each other on how these classrooms can be effectively used to enhance student learning via technology (e.g. video clips, animation, demonstrations, web interaction).

Based on instructor requests, and with the help of the Executive Dean in fall 2008, the division acquired a "Smart Cart" for use in room 16/161. In Spring term 2009, this classroom and room 271 were upgraded with podiums and whiteboards through the Federal stimulus deferred maintenance project. The majority of math instructors have incorporated elements of the "Smart Classroom" equipment into their courses, so these upgrades are a welcome improvement.

PLACEMENT TESTS:

Revision of Math Placement Tests – The math placement tests were revised and expanded to place students more accurately in the appropriate course with less "over" or "under" placement. Now a student is less likely to be over-placed by guessing. In 2005-2006, each part of the test was rewritten to be web-based and dynamically generated ensuring that students cannot memorize test questions. The tests are now more secure and can also be administered off campus at local high schools and outreach centers, which can guide students in college preparation.

Placement into MTH 065 – Based upon a need identified through enrollment tracking, lateral transfers from Math 070 to 060 or 065, and feedback from instructors, our math division Placement Testing Committee worked this year to refine the math placement test. The new test will go into affect for placement into Winter term 2010 classes. Students will then be able to place into Math 065. The hope is to ensure students will not be repeating work in MTH 060 unnecessarily, or seeing MTH 065 level content for the first time in the review format of MTH 070. New placement questions were written and normed with the help of selected Math 095 classes in Spring term 2009. This Summer the "behind the scenes" work to update the college system with the change will be completed.

TECHNOLOGY:

Hybrid Math 105 – In addition to being taught as an online course and in the traditional instructor format, MTH 105 is now also being taught with a hybrid option in response to student input. As the college infrastructure for supporting online and hybrid courses develops, we'll use lessons learned from MTH 105 to inform our decisions about hybrid instruction in the future.

Supporting Increased Use of Technology – Over the past few years there has been increased instructor use and sharing of technology. The math division has sponsored division in-service sessions and colloquia on Geogebra, MathXL (a math course management and skill practice tool), TI-Nspire, and "Smart Classroom" equipment. A growing number of instructors are incorporating MathXL into their developmental algebra classes (both traditional classes and MRC classes) and receiving positive feedback from students.

Technology Committee – A math division technology committee was formed in Fall term 2009 to steer the use of technology related to math instruction, including online and

hybrid instruction. In 2009/10 the committee will be looking at need and best practices for online and hybrid math instruction, with an eye on online programs for which math is required. One of our committee members is also working on a technology team led by Sonya Christian and Mark Williams to build greater college support for online and hybrid instruction. Our division committee will be tracking the work done by this group while we discuss our tech plans.

ASSESSMENT:

Creating a Culture of Assessment – In Fall 2006 the Math Division held a series of colloquia focused on assessment, including program assessment and using rubrics. We are also in the process of forming a Math Division Assessment Team which will guide the implementation of an assessment plan for our division and continue to offer opportunities for staff to come together and discuss issues around assessing student learning.

In 2008/09, our Math Assessment Committee was formed to work on a division assessment plan which includes both course and program level assessment. Two courses have been identified for a pilot course assessment as they will be up for textbooks searches in 2009/10. Completion and success data from IRAP, and instructor feedback are among the kinds of information that will be used to determine any necessary curricular changes prior to the text searches.

The Math Division has representation on the college-wide Assessment "A-team" and General Education Assessment Committee. In the past few years, division members have participated in refining the Gen Ed Assessment rubrics that measure critical thinking and effective communication skills. They have also participated in the gathering and scoring of math assignment artifacts, as well as the scoring artifacts from other Gen Ed areas.

ENGINEERING COURSE OF STUDY:

MTH 265 offered for first time – In 2007, MTH 265 Engineering Statistics was developed in response to changes made at OSU to strengthen the engineering program there. MTH 265 is accepted as equivalent to ST314 offered at OSU, with the stipulation that it be viewed as a lower division course. The goal was to provide continued adequate preparation for LCC's engineering transfer students who attend OSU as engineering majors. An inquiry to the Oregon State Math Chairs regarding the housing of Engineering programs/courses of study in other community colleges suggested there is much variation. MTH 265 was offered at Lane for the first time in Winter 2009. We will track enrollment and success rates using IRAP data, as well as instructor and advisor feedback.

Engineering course of study has shifted to Math Division – Our division worked with Science this spring term to transition the Engineering course of study to the Math Division at the urging of the full-time math instructors who teach 5 of the 7 sections per year of engineering courses and hold leadership roles in this area. Prior to the change,

these instructors reported to both the Science and Math Divisions as course leads in both divisions, for instructor evaluations, scheduling of courses, promotion of the engineering course of study, etc. The engineering course co-leads will work closely with the two engineering instructors in other divisions (one in Graphic Design and one in Science) to make sure they are not adversely impacted.

SUSTAINABILITY:

Sustainability Training – With the adoption of sustainability as a Lane core value, division members took an opportunity to learn more about it through a training session held this year. Art Peck who was trained through the EPA Sustainability Grant (Susie Cousar) provided math faculty with two hours of training that included an introduction to sustainability, information sources, and ideas for infusing sustainability into the math curriculum. About ten faculty (mostly full-time faculty course leads) turned out for the training and discussed how and to what extent math instructors can support educating students about sustainability. We also established a division notebook for sharing math/sustainability matierals.

ENROLLMENT:

College Now Enrollment Increase – A 40% increase in College Now math course enrollment FTE from 2006/07 to 2007/08, along with the recent approval of the state Dual Credit Standards prompted discussion of related issues at the two College Now Math Articulation meetings this year. Questions about everything from minimum qualifications for hiring of CN instructors to enforcement of prerequisites in CN courses were raised. The math division dean took some of the discussion questions to the Oregon State Math Chairs meeting in Spring 2009 and reported back to the CN math instructors. IRAP data will be used to track need for instructors with an eye to online and hybrid courses.

Enrollment Surge in 2008/09 – Enrollment in math courses in 2008/09 was up from the previous year. Increases in FTE for each term from the previous year were about 11%, 24%, and 31% (Fall, Winter, Spring). In response, sections were added, instructors often took in additional students, and the Math Resource Center (MRC) enrolled students who were unable to find a class. Addition sections have been built into our schedules for next year in anticipation of continued need.

PT Hiring process to HR – In the midst of the enrollment surge and a relatively fixed pool of part-time instructors, the division has moved its part-time faculty hiring process online through Human Resources. A hiring committee of three division members has been formed to handle the hiring as needed. Our first attempt at using the process will probably occur in Fall term 2009 or Winter 2010.