General Education SLOA Summary

General Education Category___**Mathematics**_____ Semester: ___SP 2013_____

Data Summary: (link to excel spread sheet or cut and paste a chart of summary data)

In **Spring 2013**, there were a total of **514** students who took the Mathematics General Education assessment. Of this total, **374** students were in the four major general education courses in the Mathematics category: MAT 101 (College Algebra), MAT 109 (Introduction to Statistics) , MAT 114 (Introduction to Applied Algebra) and MAT 106 (Elements of Logic). The remaining **140** students were taking mathematics courses with a MAT 101 prerequisite. These courses satisfy the general education requirement for students who do not need to take MAT 101. This happens when a student "tests out" of MAT 101 with an SAT score in mathematics above 550, or on the COMPASS test . **Significantly, there were 630 students enrolled in the four major general education courses and only 374 (59%) took the assessment and 256 (41%) did not take the assessment. Additionally**, out of the **256** that did not take the assessment, **52** (8%) officially withdrew, **5** (1%) audited the courses, **91** (14%) were walk-away F's, **14** (2%) were not in class on the day the assessment was given, and **94** (15%) were enrolled in a Web based class and were not given the assessment. These students are not reflected in most of this assessment summary.

To summarize, the *general education assessment is administered in all math classes every semester* just prior to or during final exams and measures the expected student learning outcome in Mathematics:

The ability to use numerical data and apply mathematical concepts appropriately.

The assessment allows for

- A current item analysis on each question for all math courses, Gen Ed math courses, individual courses, and individual sections which gives the faculty data on the concepts and skills in their course/section that needs to be addressed with a plan of action. Each question is benchmarked with the national PRAXIS data.
- An item analysis comparison of current results to past results on each question for all math courses, Gen Ed math courses, individual courses, and individual sections which gives the faculty data on the concepts and skills in their course/section that needs to be addressed with a plan of action.
- A current grade distribution for all math courses, individual courses, and individual sections as well as a comparison to past grade distributions.
- This is summarized for each course **on the attached chart** for all courses which administered this assessment tool in SP 2013.
- **CAAP Testing** was used in SP 2013 to provide another benchmark for this assessment (80 students in MAT 101 and MAT 109).

Discussion of Analysis Results:

Who: The FT faculty developed this assessment in SP 2012 and made the decision to administer it in all mathematics classes taught by both FT and adjunct faculty, to insure that students in the higher level mathematics courses were also achieving the learning outcomes in the mathematics category. Compilation of data and preparation of the Excel spreadsheet and attached Summary for SP 2013 was done by Associate Professor Joseph Mason.

What: The assessment tool was developed from a released PRAXIS exam (2008) and consists of 8 questions that measure and benchmark results for the expected General Education student learning outcome in mathematics. The questions specifically address the students' ability to solve problems using numbers and operations, geometry and measurement, algebra, data analysis and probability. The assessment is a timed assessment (15 minutes) and given without the use of a calculator. Instructors grade the papers from their own students and turn them in to P. Kessler and J. Mason. The results for each question for each individual student are entered by hand into the Excel Spreadsheet by J. Mason.

Where: All data and reports associated to the Gen Ed Math SLOA are stored on the y-drive, under Mathematics and Science Division, in the folder labeled SLOA , and in the folder labeled SLOA..General Ed..Math.

Link: Y:\Mathematics and Science Division\SLOA\SLOA..General Ed..Math
Use Ctrl + Click on link to access

When: The assessment is administered in the classroom or in the Testing Center. We are looking into a way to administer the assessment online for our students enrolled in a Web based class. This assessment is NOT to be confused with the 5 problem SLOA supplement to the College Algebra final exam (which is a course-specific assessment which specifically measures course learning outcomes in Algebra).

What was determined:

- HCC student (MAT 101,109, and 114) scores for each question compared to national cohort
  - Each question is linked to a skill so this can be used to modify or redesign courses to address the low assessment areas (**See attached summary chart**)
  - College Algebra students are scoring below Statistics students in several areas.

	National Cohort	MAT 101	MAT 106	MAT 109	MAT 114	Combined
N = #of students tested	2520	260	0	97	17	374
total score %	65	64		70	76	66
Q1 % correct	65	70		77	82	73
Q2 % correct	82	87		90	82	87
Q3 % correct	54	40		55	53	44
Q4 % correct	50	54		54	65	55
Q5 % correct	41	32		41	47	35
Q6 % correct	67	60		70	94	64
Q 7 % correct	87	86		85	100	86
Q 8 % correct	76	80		86	88	82

= below national norm

- From the Excel Spreadsheet there is much data that can be analyzed:
  - Grade distributions for each section or for each course can be determined and graphed
  - Individual student scores can be correlated with student grades to insure that students that are successful (A,B,C) have more skills in mathematics than unsuccessful students (D,F).
  - Changes in student scores on each question can be tracked from one semester to the next to determine if "closing the loop" changes have improved learning.
- The number of "walk-away" Fs (WF) and W are a concern in both MAT 101 and 109 and are not included in any of these numbers because these students leave before they take the assessment. Presumably before enrolling in MAT 101 or MAT 109 these students demonstrated that they were ready for a general education course by passing MAT 100 or by demonstrating MAT 100 level skills on the COMPASS exam.

Plan of Action: (closing the loop)

Faculty will implement the following steps for FA 2013:

- Identify weak areas in each course and look for ways to incorporate more content that addresses these weaknesses.
- Work with DEALS to better prepare students with a conceptual understanding of mathematics before entering MAT 101 with a goal of reducing the number of W and WFs and improve Gen Ed Assessment scores.
- Determine the preparation of students in MAT 101 and MAT 109 (high school or developmental math).
- Continue to improve on methods of collecting, recording, and storing the data.

General Education Mathematics Student Learning Outcomes Assessment Results
Spring 2013

Assessment Tool on File: 8 Questions ***2 Questions: Number and Operations*** ***2 Questions: Algebra***
2 Questions: Geometry and Measurement ***2 Questions: Data Analysis and Probability***

Approved Gen Ed Course	*Credits*	*Assessment Tool on File*	*Fall 2012 Data*	*Plan of Action*
MAT 101 College Algebra	3	See Above	n = 260 Mean Score = 64% National Norm = 65%	Strength: Q2 Weakness: Q3, Q5, Q6, & Q7 Look for ways to incorporate more ratio, proportion and probability problems throughout the course.
MAT 102 Trigonometry	3	See Above	n = 8 Mean Score = 69% National Norm = 65%	Strength: Q1, Q2, & Q7 Weakness: Q3 , Q4 & Q6 Look for ways to incorporate more ratio, proportion and probability problems throughout the course.
MAT 103 Finite Mathematics	3	See Above	Course not offered low enrollment	
MAT 106 Elements of Logic	3	See Above	Course not offered low enrollment	
MAT 107 Fundamental Concepts of Mathematics I	3	See Above	n = 9 Mean Score = 81% National Norm = 65%	Strength: Q2 & Q7 Weakness: All above norm Continue emphasizing the same material and strive for improvement in next semester's scores.
MAT 108 Fundamental Concepts of Mathematics II	3	See Above	n = 24 Mean Score = 79% National Norm = 65%	Strength: Q2, Q7 & Q8 Weakness: All above norm Continue emphasizing the same material and strive for improvement in next semester's scores.
MAT 109 Introduction to Statistics	3	See Above	n = 97 Mean Score = 70% National Norm = 65%	Strength: Q2 & Q8 Weakness: Q5 & Q7 Look for ways to incorporate more ratio, proportion and probability problems throughout the course.
MAT 110 Statistical Methods Laboratory	1	See Above	Assessment not administered	

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Approved Gen Ed Course	*Credits*	*Assessment Tool on File*	*Fall 2012 Data*	*Plan of Action*
MAT 114 Introduction to Applied Algebra	3	See Above	n = 17 Mean Score = 76% National Norm = 65%	Strength: Q6, Q7, & Q8 Weakness: Q3 Look for ways to incorporate more ratio, proportion and probability problems throughout the course.
MAT 161 Pre-Calculus	4	See Above	n = 35 Mean Score = 79% National Norm = 65%	Strength: Q2, Q7, & Q8 Weakness: All above norm Continue emphasizing the same material and strive for improvement in next semester's scores.
MAT 164 Calculus with Applications	3	See Above	n = 7 Mean Score = 79% National Norm = 65%	Strength: Q6 & Q8 Weakness: Q2 & Q7 Look for ways to incorporate more ratio, proportion and probability problems throughout the course.
MAT 203 Calculus I	4	See Above	n = 20 Mean Score = 82% National Norm = 65%	Strength: Q1, Q2, & Q7 Weakness: All above norm Continue emphasizing the same material and strive for improvement in next semester's scores.
MAT 204 Calculus II	4	See Above	n = 17 Mean Score = 88% National Norm = 65%	Strength: Q2, Q6, & Q8 Weakness: All above norm Continue emphasizing the same material and strive for improvement in next semester's scores.
MAT 205 Calculus III	4	See Above	n = 7 Mean Score = 91% National Norm = 65%	Strength: Q1, Q2, Q4, & Q8 Weakness: All above norm Continue emphasizing the same material and strive for improvement in next semester's scores.
MAT 206 Differential Equations	4	See Above	n = 13 Mean Score = 91% National Norm = 65%	Strength: Q7 & Q8 Weakness: All above norm Continue emphasizing the same material and strive for improvement in next semester's scores.
MAT 208 Linear Algebra	4	See Above	Course not offered in Fall	
Overall			***n = 514*** ***Mean Score = 70%*** ***National Norm = 65%***	***Strengths: Q2 (89% vs 82%) & Q7 (88% vs 87%)*** ***Weaknesses: Q3 (52% vs 54%), & Q4 (60% vs 50%), Q5 (42% vs 41%)*** ***Look for ways to incorporate more ratio, proportion and probability problems throughout all courses.***

Red is National Norm