General Education SLOA Summary

General Education Category___**Mathematics**_____ Semester: ___FA 2013/SP 2014

Data Summary: (Refer to Data Table 4 attached)

In **Academic Year 2014** (Fall 2013 and Spring 2014) there were a total of **1569** students took a mathematics class in the general education category. Of that number, **1159** students took the Mathematics General Education assessment *(**504** in FA 2013 and **665** in SP 2014)*. The discrepancy in numbers needs explanation. 1. Several ESSENCE classes offered in the high schools), *did not give the assessment* to their students at the end of the course. This was a requirement for all ESSENCE classes when the course was approved for each high school. The number of students it involves is 96, a relatively large number. Since this assessment is mandatory for all sections of general education mathematics, it was partially corrected in spring 2014 and will be completely corrected in fall 2014. 2. A significant number of students withdraw officially, walk-away and receive an F, or change to audit. They never take the gen ed assessment. For AY 2014, this was 247 students.

Of this **1569** students taking a general education course, **1276** students were in the four major general education courses in the Mathematics category. The remaining **293** students were taking mathematics courses with a MAT 101 prerequisite. The % students completing the assessiment in the four major general education mathematics courses was:

- MAT 101 (College Algebra), 72.7%, n=592
- MAT 109 (Introduction to Statistics) , 76.1%, n=268
- MAT 114 (Introduction to Applied Algebra) 86.1%, n=42
- MAT 161 (Pre-Calculus), 86.4% n=51

The aggregated data for all four of the primary general education mathematics courses:

- 1169 (72.7%) took the assessment
- 411 (26.2%) did not take the assessment. These students would include those who officially withdrew, walk-away F's, auditors and students absent from class when the assessment was given.

For the **293** students not taking one of the four primary general education courses, these courses are program requirements. But, these courses can also satisfy the general education requirement for students who do not need to take MAT 101 which happens when a student "tests out" of MAT 101 with an SAT score in mathematics above 550, or on the COMPASS test. Therefore, all mathematics courses are assessed with the same general education tool. We would expect these students to score higher on the Gen Ed assessment that non-majors taking a 100-level math course. Therefore they were omitted from the first calculation of the test scores and included on the second calculation which did raise the overall scores on each question appreciably. This gen ed assessment is not to be confused with the SLOA *common course assessments* which are different in all mathematics courses.

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 for the mathematics general education area:

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

The assessment allows for

- Benchmarking of each question with the national PRAXIS data base.
- 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.

- 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.
- This is summarized for each course **on the attached chart** for all courses which administered this assessment tool in AY 2014.

External Validation

An additional benchmark for mathematics student learning outcomes is selective CAAP Testing of a few MAT 101 and MAT 109 sections each year. This was done in FA 2013 to provide another benchmark for this assessment (80 students in MAT 101 and MAT 109 were tested). This sample of 80 HCC students in the most popular general education mathematics courses showed that **HCC students were above the national norm with a score of 58.2 ‡ 3.4 vs. 56.0 ‡ 3.5 (n=27868).**

Discussion of Analysis Results:

Who: The FT mathematics 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. This insures that students in the higher level mathematics courses are also achieving the learning outcomes in the mathematics category.

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

- Geometry and measurement
- numbers and operations,
- Data analysis and probability
- Algebra

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\Foundation Docs Courses\Math\SLOA Data\SLOA\GenEd Report FA13.pdf
Y:\Mathematics and Science Division\Foundation Docs Courses\Math\SLOA Data\SLOA|GenEd Report Sp14.pdf

When: The assessment is administered in the classroom or in the Testing Center with the final exam. 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).

Concerns:

411 students who registered for these four general education courses are not included in the numbers below and that is a concern. Most of these students were is high school ESSENCE classes that did not comply with the requirement to take the assessment, "walk-away" Fs (WF) and students who officially withdrew (W) before they took 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. See Data Table 1 for an item analysis of Fall 2013.

Closing the Loop:

Decreasing the large number of students who register for one of the primary general education math classes and never complete the course and take the SLOA assessment was a goal for the year based on data from the AY 1013. The % students who did not take the assessment (and presumably did not complete the course) in 2012/2013 was 26% for FA 2012 and 41% for SP 2013. For 2013/2014 this was reduced to 24.3% for FA 13 and 26.4% for SP 2014.

Data Table 1. FALL 2013

	National Cohort	MAT 101	MAT 109	MAT 114	MAT 161	Combined Gen Ed	All courses
N = #of students tested	2520	269	98	20	19	406	504
total score weighing factor		0.66	0.24	0.049	0.047	1.00	
Q1 % correct	65	71	63	85	100	70.8	74
Q2 % correct	82	84	86	95	84	84.7	87
Q3 % correct	54	59	51	65	58	57.1	62
Q4 % correct	50	60	50	75	58	58.0	63
Q5 % correct	41	44	39	45	16	41.4	45
Q6 % correct	67	62	68	75	74	64.4	68
Q 7 % correct	87	81	83	85	84	81.5	84
Q 8 % correct	76	83	78	90	74	83.7	83

= below national norm

Data Table 2. SPRING 2014

	National Cohort	MAT 101	MAT 109	MAT 114	MAT 161	Combined Gen Ed	All MAT courses
N = #of students tested	2520	323	170	22	32	547	665
total score weighing factor		0.590	0.311	0.0402	0.0585	1.00	
Q1 % correct	65	69	61	64	81	67.0	69
Q2 % correct	82	87	79	91	88	84.7	87
Q3 % correct	54	57	55	36	75	56.6	57
Q4 % correct	50	62	63	59	84	63.5	62
Q5 % correct	41	43	36	50	63	42.3	43
Q6 % correct	67	68	62	86	75	67.4	68
Q 7 % correct	87	84	82	82	100	84.2	84
Q 8 % correct	76	79	69	77	100	77.0	79

= below national norm

- MAT 109 (Introduction to Statistics performed below the national norm more than any of the other general education courses
- When all math courses were included in the analysis for each question, the scores increased. These scores include all the upper level courses with a MAT 101 prerequisite so students will have completed MAT 101 or have tested out of it. In other words, these students are stronger in mathematics and would be expected to do better on this test.
- Spring semester students scored lower than fall semester students
- Scores for FA 13 and SP 14 students were higher than scores for the FA 12 and SP 13 students except for question 2 and SP 13 questions 7 and 8. **One possible explanation for this remarkable improvement could be the increased use of the Student Support Center.**

Item Analysis for General Education Mathematics Fall 2013 and Spring 2014

The mathematics general education assessment was developed using released questions from the nationally normed PRAXIS I exam administered in 2008 which allowed the HCC assessments to be compared to students in a national pool (n=2,520). Aggregate data for HCC students in every class is included in the spreadsheet on the Y drive. In general,

- HCC students scored above the national benchmark for all eight questions except for question 8.
- MAT 114 and MAT 161 students

Data Table 3. Item Analysis (15 minutes - no calculator)

Question Number	*Content Category*	*National Pool N=2520*	*HCC Students Fall 2013 N=504*	*HCC Students Spring 2014 N=665*	*Change from AY 2013*	
					FA 12	*SP 13*
1	Geometry and Measurement	65%	74	69	↑	↓
2	Number and Operation	82%	87	87	↓	↔
3	Data Analysis and Probability	54%	62	57	↑	↑
4	Algebra	50%	63	62	↑	↑
5	Number and Operation	41%	45	43	↑	↑
6	Data Analysis and Probability	67%	68	68	↑	↑
7	Algebra	87%	84	84	↑	↓
8	Geometry and Measurement	76%	83	79	↑	↓
Total/Ave	Average Score	65%	70.8	68.6	65.8	65.8

Praxis defines the difficulty of questions as Easy, Average, and Difficult.

Easy question = 75% or more answered correctly (Questions 2, 7, 8)

- HCC students scored above the national mean for Questions 2 and 8 for both semesters but below the national mean for question 7 (Algebra)

Average question = 55% – 74% answered correctly (Questions 1, 6)

- HCC students scored above the national mean for both questions 1 and 6 for both semesters

Difficult question = less than 55% answered correctly (Questions 3, 4, 5)

- HCC students scored above the national mean for all three of these questions in the "difficult" category.

Data Table 4. : General Education Mathematics Assessment Academic Year 2014

Fall 2013			Spring 2014		AY 13/14		% Completed SLOA assessment
Course	Registered	Completed	Registered	Completed	Registered	Completed	
‡MAT 101	368	269	446	323	814	592	72.7%
MAT 102	Not offered in Fall		0	0	0	0	
MAT 103	6	5	6	4	12	9	
MAT 107	22	17	19	17	41	34	
MAT 108	13	11	29	23	42	34	
‡MAT 109	132	98	220	170	352	268	76.1%
‡MAT 114	25	20	26	22	51	42	82.4%
‡MAT 161	22	19	37	32	59	51	86.4%
MAT 164	0	0	12	7	12	7	
MAT 203	38	32	41	31	79	63	
MAT 204	16	12	33	16	49	28	
MAT 205	Not offered in Fall		17	10	17	10	
MAT 207	14	14	17	10	31	24	
MAT 206	Not offered in Fall		0	0	0	0	
MAT 208	10	7	0	0	10	7	
TOTALS	666	504	903	665	1569	1169	74.5%
National Cohort Completing Exam	2520		2520		2520		

*Active students (mostly ESSENCE students in sections at the high schools) who did not complete the SLOA Gen Ed Assessment have been excluded from the number of active students. This assessment is mandatory for all students in Gen Ed mathematics courses and this will be addressed with the off-campus instructors (again).

**A total of 96 active students have been subtracted from this total because the assessment data is missing and they were not included in the "completed" total.

‡ four major general education courses in Mathematics. Remaining courses have MAT 101 prerequisite.