General Education SLOA Summary

General Education Category: __**Mathematics**__   Semester: _Academic Year 2017_ _(FA 2016 → SP 2017)_

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

In **AY 2017** there were a total of **1368** students who enrolled in a Mathematics General Education course. There are a total number of **17** mathematics courses and of this total the **4** major general education mathematics courses (requiring only MAT 100 or the equivalent) enroll 1368 students: MAT 101 (College Algebra), MAT 103 (Finite Math), MAT 109 (Introduction to Statistics) and MAT 114 (Introduction to Applied Algebra). A fifth course, MAT 106 (Elements of Logic) is also a Gen Ed course but enrollments were insufficient in AY2016/AY2017 to run the course. It is being discontinued.

The remaining students were taking mathematics courses with a MAT 101 prerequisite. These courses satisfy the mathematics Gen Ed 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,** of the **1368** students enrolled in MAT 101, 103,109 or114, **281** or 17.0% of the total students *never took the assessment* because they either officially withdrew (6.7%) or they were "walk-away Fs" " (13.8%) (See Table 3). 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* 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

- An item analysis on each question which gives the faculty data on the concepts and skills in their course/section that need to be addressed with a plan of action. This is summarized for each course **(See Table 2) f**or all courses which administered this assessment tool in AY 2016.
- Each course is benchmarked with the national PRAXIS data which shows that the 4 major general education courses which the majority of HCC students use to satisfy their mathematics requirement have scores of which are below the national norm for some topics. For a summary of the aggregate scores for these 4 courses, (**See Table 1).**
- The courses with a prerequisite of MAT 101 (require an SAT score of 550 or higher) do better and specific content areas are easily addressed. **(See Table 4)**

CAAP Testing is planned for SP 2017 or FA17. This will provide another benchmark for general education math assessments. (100 students in MAT 101 and MAT 109). The last CAAP Testing was done in FA 2016 for MAT 101 and MAT 109 classes and HCC students were above the national norm.

Discussion of Analysis Results:

Who: The FT faculty developed this assessment 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 used in this report is done by a custom program nicknamed "*Mathy*". Grades and % success are collected directly from Datatel. Instructors must enter the # of walk-away F's and common assessment scores. This Gen Ed Summary report includes only the **Gen Ed** assessment for AY 2017 but there is another assessment given for every math course (not the same assessment for every course) called the **common course assessment**. This assessment is included on the Annual SLOA Summary Report (this is the Annual Gen Ed SLOA Summary).

What: The assessment tool for all Gen Ed courses 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. Students are given the questions on a separate paper from the rest of their exam and they circle the correct answers. Instructors grade the papers from their own students. The results for each question for each individual student are entered by hand into an Excel Spreadsheet by each instructor. The data can be correlated with each student's grade and summarized by section which provides a comparison of traditional, on-line and hybrid sections. A table of the content assessed by each question with the % correct for the National Cohort and the % correct for the HCC students taking this assessment in AY 2016.

Table 1.

Question Number	*Content Category*	*Percentage Correct*	*%Correct HCC *Gen Ed*
		National, n =2520	n = 1368
1	Geometry and Measurement	65%	66.40%
2	Number and Operation	82%	82.10%
3	Data Analysis and Probability	54%	55.30%
4	Algebra	50%	59.70%
5	Number and Operation	41%	46.10%
6	Data Analysis and Probability	67%	52.40%
7	Algebra	87%	81.90%

*includes only the 4 basic Gen Ed courses with a MAT 100 prerequisite (101,103,109,114).

☐ = below national norm

Where: The assessments were administered in the classroom as supplements to final exams or in the Testing Center if the final exam is given in the Testing Center. 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 College Algebra or the MAT 109 (Introduction to Statistics) 18-item common course assessment. Both of these assessments are different from the Gen Ed Assessment (8 questions) described in this report.

When: Most of the assessing occurs during the final exam period each semester. Data for the summer semester is not included here. Ideally, data analysis for these General Education assessments is done at the end of the academic year. Realistically, it occurs in late summer or early fall.

What was determined?
- HCC students (MAT 101, 109,and 114) scores for each question are compared to the national cohort in **Table 2.**
  - Statistics students are scoring below College Algebra students in most areas.
  - Question 3 (Data Analysis and Probability) scores for HCC MAT 114 students did not meet the national norm.
  - Question 7 (Algebra) scores for HCC students in every Gen Ed course did not meet the national norm.
  - Question 6 (Data Analysis and Probability) scores for statistics students did not meet the national norm.

Table 2. Course Specific Item Analysis

Gen Ed Mathematics Assessment AY 2017 (MAT 101, 103, 109, 114)

	National Cohort	MAT 101 FA 2016	MAT 101 SP 2017	MAT 109 FA 2016	MAT 109 SP 2017	MAT 103 FA 16	MAT 114 FY 2016	Total FY 2017
N = #of students tested	2520	342 (.283)	335 (.277)	267 (.221)	236 (.195)	6 (.004)	22 (.018)	1208 (1)
total score %	65.3	67	67.9	61.8	59	75	66.3	66.0
Q1 % correct	65	69	71	56	55	75	65	65.1
Q2 % correct	82	82	80	86	73	75	90	81.1
Q3 % correct	54	60	63	60	55	50	40	54.6
Q4 % correct	50	58	60	59	60	75	70	61.7
Q5 % correct	41	40	45	29	30	25	30	34.3
Q6 % correct	67	65	69	58	49	75	60	63.3
Q 7 % correct	87	82	80	78	79	75	90	81.6
Q 8 % correct	76	80	75	68	71	100	85	79.3

███ = below national norm

- 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.

- The National Community College Benchmark Project (NCCBP) provides Retention and Success data for Core Academic Skills as follows:

	National for 50th %tile	*HCC Reported Value
Algebra Retention rate	86.41%	93.42% (official withdrawals only)
Algebra Enrollment success	66.35%	68.09%
Algebra Completer success	77.87%	72.89%

 * Fall 2015 data (NCCBP is always reporting on data which is about 2 years old)

Table 3. % Success, Withdrawal, D,F for Math Classes AY 2017.

	*Total registered	%A,B,C	%W	% Walk-away F	% D, F
MAT 101	743	69.99%	5.25%	14.54%	24.23%
MAT 103	20	100.00%	0.00%	0.00%	0.00%
MAT 109	738	57.59%	6.91%	10.84%	15.99%
MAT 114	22	95.45%	0.00%	4.55%	4.55%
**NCCBP	236 institutions	63.40%	14.10%	Not reported	22.50%
(Algebra)					
MAT 107	36	100.00%	2.78%	2.78%	2.78%
MAT 108	35	94.29%	0.00%	0.00%	0.00%
MAT 161	96	81.25%	3.13%	8.33%	12.50%
MAT 164	11	63.64%	18.18%	9.09%	18.18%
MAT 203	109	77.98%	5.50%	3.67%	12.84%
MAT 204	56	51.79%	5.36%	3.57%	10.71%
MAT 205	10	90.00%	10.00%	0.00%	0.00%

| MAT 206 | 20 | 95.00% | 0.00% | 0.00% | 0.00% |
| MAT 207 | 15 | 100.00% | 0.00% | 0.00% | 0.00% |

* FA 16, SP 17, SU16 only   **50th %tile values

Table 4. Item Analysis of Praxis Assessment for every Mathematics Course, SP 17

	Registered	Completed	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8
National Norm		N=2520	65%	82%	54%	50%	41%	67%	87%	76%
MAT 101	743	610	66.3	80.3	54.8	56.5	41.5	63.8	80.5	75.5
MAT 102	9	1	100.0	0.0	0.0	0.0	100.0	100.0	100.0	100.0
MAT 103	6	4	75.0	75.0	75.0	50.0	75.0	25.0	75.0	100.0
MAT 107	36	36	65.0	80.5	60.0	60.5	40.0	66.5	87.5	74.5
MAT 108	35	34	71.0	94.0	44.5	65.5	54.0	71.0	100.0	94.0
MAT 109	597	487	59	83	52	62	38	61	82	77
MAT 114	22	20	65	90	40	70	30	60	90	85
MAT 161	118	77	90	88	67	70	43	74	76	86
MAT 164	0									
MAT 203	108	76	90	91	78	65	53	74	92	88
MAT 204	56	44	93	91	76	80	66	89	98	98
MAT 205	10	9	100	100	100	100	100	100	100	100
MAT 206	20	16	100	75	75	69	63	56	100	94

The number of students enrolled in a class who do not take the Gen Ed Assessment at the end of the course has been a concern. In the past there have been three groups of students in this category:
1. students who officially withdraw,
2. students who walk away from the course without withdrawing do not take the assessment and
3. ESSENCE students in the high schools who do not take the Gen Ed assessment (or the common course assessment) because the instructors fail to administer these tests. That problem was addressed in AY 14 and all ESSENCE students taking MAT 101, MAT 109 or MAT 203 (the only 3 ESSENCE courses given on site at the high schools) were given these exams. This was corrected in WCPS area schools but this is still occurring the PA schools.

General Education Mathematics Data AY 2017

MAT 101, College Algebra

Semester	N = # of students	# successful Students	Success, %	Walk away F	Withdrawal	Mean GPA	Course Out of 35	Gen Ed Out of 8
16/SU	66	50	75.8%	14	2	2.22	26.12	4.75
16/FA	341	268	78.6%	52	21	2.47	26.71	5.36
17/SP	336	277	82.4%	42	16	2.41	25.07	5.42
Total	743	595	80.1%	108	39	2.37	25.97	5.18

MAT 103, Finite Math

Semester	N = # of students	# successful Students	Success, %	Walk away F	Withdrawal	Mean GPA	Course	Gen Ed Out of 8
16/SU	not offered							
16/FA	6	4	66.7%	0	2	2.25	18.75	5.5
17/SP	not offered							
Total	6	4	66.7%	0	2	2.25	18.75	5.5

MAT 109, Introduction to Statistics

Semester	N = # of students	# successful Students	Success, %	Walk away F	Withdrawal	Mean GPA	Course Out of 19	Gen Ed Out of 8
16/SU	94	78	83.0%	6	10	2.72	7.42	4.96

Semester	N = # of students	# successful Students	Success, %	Walk away F	Withdrawal	Mean GPA	Course Out of 10	Gen Ed Out of 8
16/FA	267	206	77.2%	35	26	2.46	8.02	4.94
17/SP	236	181	76.7%	39	15	2.34	8.16	4.72
Total	597	465	77.9%	80	51	2.51	7.87	4.87

MAT 114, Applied Algebra

Semester	N = # of students	# successful Students	Success, %	Walk away F	Withdrawal	Mean GPA	Course Out of 10	Gen Ed Out of 8
16/SU								
16/FA	22	21	95.5%	1	0	3.27	5.15	5.3
17/SP								
Total	22	21	95.5%	1	0	3.27	5.15	5.3