

## General Education SLOA Summary

General Education Category Mathematics Semester: Academic Year 2016 (FA 2015 → SP 2016)

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

In **AY 2016** there were a total of **1804** 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 1232 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 to run the course. It was offered as an honors section (106H) in hopes that it would attract students, but it did not.

The remaining **458** 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 **1232** students enrolled in MAT 101, 103, 109 or 114, **308** or 25.0% of the total students *never took the assessment* because they either officially withdrew (8.5%) or they were “walk-away Fs” (16.0%) (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**) for 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 2015 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 2016 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.**

| <i>Question Number</i> | <i>Content Category</i>       | <i>Percentage Correct National, n =2520</i> | <i>%Correct HCC *Gen Ed, n = 1175</i> |
|------------------------|-------------------------------|---|---------------------------------------|
| 1                      | Geometry and Measurement      | 65%   | 66.5%                                 |
| 2                      | Number and Operation          | 82%   | 83.5%                                 |
| 3                      | Data Analysis and Probability | 54%   | 54.7%                                 |
| 4                      | Algebra                       | 50%   | 61.7%                                 |
| 5                      | Number and Operation          | 41%   | 42.3%                                 |
| 6                      | Data Analysis and Probability | 67%   | 66.5%                                 |
| 7                      | Algebra                       | 87%   | 80.2%                                 |
| 8                      | Geometry and Measurement      | 76%   | 81.0%                                 |

\*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 2016 (MAT 101, 109, 114)

|                                | National Cohort | MAT 101 FA 2015 | MAT 101 SP 2016 | MAT 109 FA 2015 | MAT 109 SP 2016 | MAT 114 AY 2016 | Total AY 2015 |
|--------------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|---------------|
| <b>N = #of students tested</b> | 2520            | 306 (.260)      | 388 (.330)      | 231 (.196)      | 218 (.185)      | 32 (.027)       | 1175 (1.00)   |
| <b>total score %</b>           | 65              | 69.3            | 70.9            | 65.3            | 64.4            | 66.3            | 67.04         |
| <b>Q1 % correct</b>            | 65              | 67              | 75              | 75              | 60              | 70              | 66.5          |
| <b>Q2 % correct</b>            | 82              | 86              | 86              | 94              | 84              | 80              | 83.5          |
| <b>Q3 % correct</b>            | 54              | 62              | 63              | 81              | 52              | 45              | 54.7          |
| <b>Q4 % correct</b>            | 50              | 63              | 65              | 88              | 61              | 57.5            | 61.7          |
| <b>Q5 % correct</b>            | 41              | 46              | 45              | 50              | 35              | 47.5            | 42.3          |
| <b>Q6 % correct</b>            | 67              | 69              | 73              | 69              | 64              | 67.5            | 66.5          |
| <b>Q 7 % correct</b>           | 87              | 80              | 81              | 100             | 81              | 77.5            | 80.2          |
| <b>Q 8 % correct</b>           | 76              | 81              | 79              | 100             | 78              | 85              | 81            |

 = 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 50 <sup>th</sup> %tile | *HCC Reported Value               |
|----------------------------|-------------------------------------|-----------------------------------|
| Algebra Retention rate     | 85.9%                               | 90.2% (official withdrawals only) |
| Algebra Enrollment success | 63.4%                               | 59.3%                             |
| Algebra Completer success  | 68.2%                               | 65.8%                             |

\* Fall 2013 data (NCCBP is always reporting on data which is about 2 years old)

**Table 3. % Success, Withdrawal, D,F for Math Classes AY 2016.**

|                          | *Total registered | %A,B,C | %W    | % Walk-away F | % D, F |
|--------------------------|-------------------|--------|-------|---------------|--------|
| MAT 101                  | 737               | 74.1%  | 6.5%  | 17.4%         | 25.9%  |
| MAT 103                  | 0                 | 0      | 0     | 0             | 0      |
| MAT 109                  | 483               | 78.1%  | 10.8% | 15.1%         | 21.9%  |
| MAT 114                  | 29                | 93.1%  | 10.3% | 3.4%          | 6.9%   |
| <b>**NCCBP (Algebra)</b> | 236 institutions  | 63.4%  | 14.1% | Not reported  | 22.5%  |
| MAT 107                  | 28                | 96.4%  | 0     | 0             | 3.6%   |
| MAT 108                  | 28                | 96.4%  | 7.1%  | 0             | 3.6%   |
| MAT 161                  | 106               | 79.2%  | 8.5%  | 14.2%         | 20.8%  |
| MAT 164                  | 17                | 70.6%  | 23.5% | 11.8%         | 29.4%  |
| MAT 203                  | 100               | 83.0%  | 5.0%  | 5.2%          | 17.0%  |
| MAT 204                  | 59                | 69.5%  | 11.9% | 15.3%         | 30.5%  |
| MAT 205                  | 10                | 80.0%  | 0     | 10.0%         | 20.0%  |
| MAT 206                  | 30                | 96.7%  | 0     | 0             | 3.3%   |
| MAT 207                  | 22                | 95.5%  | 4.55% | 0             | 4.5%   |
| MAT 208                  | 8                 | 75.0%  | 25.0% | 0             | 25.0%  |

\* FA 15, SP 16, SU16only

\*\*50<sup>th</sup> %tile values

**Table 4. Item Analysis of Praxis Assessment for every Mathematics Course, FA 15,SP 16**

|               | Registered | Completed | Q1      | Q2      | Q3      | Q4      | Q5      | Q6       | Q7      | Q8      |
|---------------|------------|-----------|---------|---------|---------|---------|---------|----------|---------|---------|
| National Norm |            | N=2520    | %<br>65 | %<br>85 | %<br>54 | %<br>50 | %<br>41 | %<br>67  | %<br>87 | %<br>76 |
| MAT 101       | 694        | 565       | 71      | 86      | 62.5    | 64      | 45.5    | 71       | 80.5    | 80      |
| MAT 102       | 12         | 10        | 100     | 60      | 80      | 80      | 60      | 250      | 80      | 100     |
| MAT 107       | 28         | 28        | 62.5    | 88.5    | 65.5    | 69      | 54      | 68       | 100     | 91.5    |
| MAT 108       | 30         | 28        | 72.5    | 83.5    | 78.5    | 59      | 56      | 83.<br>5 | 92      | 94.5    |
| MAT 109       | 449        | 359       | 58.5    | 66.5    | 56.5    | 63.5    | 34      | 61       | 82.5    | 78      |
| MAT 114       | 32         | 25        | 70      | 80      | 45      | 57.5    | 47.5    | 67.<br>5 | 77.5    | 85      |
| MAT 161       | 100        | 70        | 89      | 87      | 70      | 68      | 43      | 65.<br>5 | 89      | 83      |
| MAT 164       | 11         | 8         | 44      | 44      | 44      | 31.5    | 25      | 25       | 44      | 44      |
| MAT 203       | 84         | 68        | 97      | 90      | 81      | 79.5    | 63.5    | 84       | 95.5    | 91.5    |
| MAT 204       | 66         | 46        | 94.5    | 89      | 92      | 84.5    | 72      | 84.<br>5 | 97.5    | 94      |
| MAT 205       | 10         | 9         | 44.5    | 50      | 33.5    | 39      | 44.5    | 44.<br>5 | 50      | 50      |
| MAT 206       | 30         | 25        | 46      | 48      | 48      | 48      | 36      | 38       | 48      | 44      |
| MAT 207       | 23         | 19        | 50      | 47.5    | 42      | 42      | 34      | 44.<br>5 | 50      | 50      |
| MAT 208       | 10         | 8         | 44      | 37.5    | 50      | 50      | 37.5    | 37.<br>5 | 50      | 37.5    |

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 2016**

**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 |
|----------|-------------------|-----------------------|------------|-------------|------------|----------|------------------|-----------------|
| 15/FA    | 306               | 207                   | 67.9       | 35          | 20         | 2.31     | 26.5             | 5.19            |
| 16/SP    | 389               | 284                   | 73.6       | 32          | 13         | 2.36     | 25.39            | 5.55            |
| 15/SU    | 90                | 55                    | 63.2       | 15          | 8          | 2.29     | 25.63            | 4.75            |
| Total    | 785               | 546                   | 68.2       | 13.10%      | 6.20%      |          |                  |                 |

**MAT 103, Finite Math**

| Semester | N = # of students             | # successful Students | Success, % | Walk away F | Withdrawal | Mean GPA | Course | Gen Ed Out of 8 |
|----------|-------------------------------|-----------------------|------------|-------------|------------|----------|--------|-----------------|
| 15/FA    | low enrollment class canceled |                       |            |             |            |          |        |                 |
| 16/SP    | low enrollment class canceled |                       |            |             |            |          |        |                 |
| 15/SU    | not offered                   |                       |            |             |            |          |        |                 |
| Total    |                               |                       |            |             |            |          |        |                 |

**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 |
|----------|-------------------|-----------------------|------------|-------------|------------|----------|------------------|-----------------|
| 15/FA    | 225               | 157                   | 69.8       | 19          | 19         | 2.41     | 8.33             | 5.19            |
| 16/SP    | 214               | 141                   | 65.9       | 29          | 19         | 2.39     | 8.12             | 5.1             |
| 15/SU    | 90                | 69                    | 76.7       | 0           | 13         | 2.66     |                  |                 |
| Total    | 529               | 367                   | 70.8       | 9.07%       | 57         | 2.32     |                  |                 |

**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 |
|----------|-------------------|-----------------------|------------|-------------|------------|----------|------------------|-----------------|
| 15/FA    | 22                | 20                    | 90.9       | 0           | 2          | 3.6      | 5.15             | 6               |
| 16/SP    | 10                | 7                     | 70         | 1           | 1          | 2.89     | 5.5              | 4.6             |
| Total    | 32                | 27                    | 80.5       | 1           | 3          | 3.25     | 5.33             | 5.30            |

