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**Trinity Washington University**

**College of Arts and Sciences**

**Course Assessment Report**

**Math 102, College Algebra**

**Math 108, Finite Mathematics**

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**Introduction**

**Objectives:** The objective of this report is to assess the redesigned Math 102, College Algebra course (formally Intermediate Algebra) and Math 108, Finite Mathematics to determine if the courses with its integrated review of prerequisites (high school algebra) and supplemental instruction, are meeting the initial objectives of the redesign.

* Meet the needs of the incoming student population each semester so that the University goals of retention are met without compromising the course integrity or the course content standards.
* Eliminate developmental math courses and place students directly into a college credit bearing course their first semester.

**Goals:** The goals of this report are threefold. The first goal is to review the overall pass/fail/withdrawal rates of the course, to determine if the rates are acceptable, and to test how they compare to other institutions that are also attempting to eliminate developmental mathematics.

The second goal is to examine the students’ prerequisites skills (or lack thereof) against how they fared throughout the semester. Did the students’ lack of prerequisites skills negatively affect their progress through a college level course without a developmental course? Did the supplemental instructional sessions (both on-line and in labs) fill in the gaps of the students’ numeracy skills?

And last, is the amount of work that we are asking our under-resourced students to do excessive in a single semester?

**Semester:** Fall Semester 2015

**Courses:** Math 102, College Algebra, 2 sections, n = 45

 Math 108, Finite Mathematics, 6 sections, n = 114

**Summary of Achievement:**

**Goal 1. Pass/Fail/Withdrawal**

**Dashboard**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Course | Registered | Pass (grades of A, B, C, D) | No Pass (grades of F, W) |
| Fall 2009 | Math 100/101/101S | 176 | 23% (n=40) | 77% (n = 136) |
|  |  |  |  |  |
| Fall 2010 | Math 101S | 206 | 40% (n = 82) | 60% (n = 124) |
| Fall 2011 | Math 101S | 221 | 39% (n = 86) | 61% (n = 135) |
| Fall 2012 | Math 101S | 191 | 53% (n = 101) | 47% (n = 90) |
| Fall 2013 | Math 101S | 223 | 52% (n = 116) | 48% (n = 107) |
| Fall 2014 | Math 101S | 254 | 53% (n = 135) | 47% (n = 119 |
|  |  |  |  |  |
| Fall 2015 | Math 102 | 45 | 56% (n = 29) | 44% (n=16) |
| Fall 2015 | Math 108 | 114 | 59% (n = 67) | 41% (n = 47) |

**Notes**

During the summer of 2010, developmental math was redesigned moving from three developmental (Math 100, Math 101, and Math 101S) levels of math to one (Math 101S only).

During the summer of 2015, developmental math was eliminated and all of the entry level math courses were changed to 4 credits.

**Key Findings**

Of the 45 students that registered for Math 102, 29 (64%) were 1st year/1st semester students. And of those students, 25/29 (86%) would have placed into Math 101S (developmental introductory algebra) under the old system. The data for the Math 108 course with six sections is incomplete and 1st year/1st semester students is unknown at this time.

Of the students that withdrew from Math 102, five changed their meta-majors and are currently enrolled in another math course. Subtracting students that choose to withdraw and change their majors from the totals reported above would raise the overall pass rate to 72.5%. However due to students being allowed to choose any meta-major they wish, some may end up in a calculus sequence they do not have the intrinsic drive to succeed at in a STEM field, but their attempt will be counted as a negative (No Pass), when in actuality the student was successful in discovering the field they are better suited for. While this report includes those students’ outcomes in the data, please note that this outcomes can also be viewed as helping the student get on the right track.

Pilot programs (GA, WV, TN) with Complete College America (with co-requisite remediation – similar, but not the same as our integrated review with supplemental instruction) show pass rates in Math of 61-63% for students after 1 year (2 semesters). Trinity will easily surpass those percentages with the students that are repeating Math 102 and Math 108 during the spring 2016 semester.

**Goal 2. Prerequisite skills: Dashboard**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Math 102 Chapter** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** | **Average** |
| **Prerequisite Skills Check Test** | **87** | **50** | **74** | **80** | **57** | **78** | **66** | **54** | **68** |
| **Chapter Review Quiz** | **84** | **74** | **67** | **76** | **68** | **73** | **70** | **71** | **73** |
|  |  |  |  |  |  |  |  |  |  |
| **Math 108 Chapter** | **1** | **2** | **3** | **5** | **6** | **7** | **9** | **11** | **12** | **Average** |
| **Prerequisite Skills Check Test** | **71** | **93** | **n/a** | **77** | **66** | **58** | **76** | **48** | **55** | **68** |
| **Chapter Review Quiz** | **71** | **84** | **86** | **77** | **70** | **79** | **88** | **75** | **77** | **79** |

**Key Findings**

All students on the Saturday prior to the week’s classes were to take an on-line (MyMathLab) Prerequisite Skills Check Test. The skills check test was designed to test the prerequisite skills that the students should have in order to successful with the material that would be presented that upcoming week.

Once the skills check test (an ungraded assignment) was done – an automated homework assignment would pop-up on the student’s MyMathLab (MML). These assignments were all individualized based on the student’s performance and would be accompanied by learning tools and short videos for the student to “catch-up.” This homework assignment would be graded and for any are in which a student still had a remaining question – students would use a feature called “ask instructor” and that question would be sent to the instructor’s email box.

An item analysis would then be done by the instructor on all missed/incorrect answers and “ask instructor” questions along with those questions that the students took the most time answering. These were put together for an open supplemental instructional session (Monday Mathematics). Students that did poorly on the skills check test were encouraged to attend the Monday Mathematics sessions.

Overall, students entering Math 102, College Algebra or Math 108, Finite Mathematics, had 68% of the necessary prerequisite skills to be successful at a college level course. However the average for all students on the chapter quizzes was 73% for Math 102 and 79% for Math 108. These outcomes suggest that students’ overall lack of 32% of the skills needed to be successful in either course doesn’t merit a full semester in developmental algebra.

The supplemental instruction, Monday Mathematics, and Thursday Labs allow students to progress to the next sequential math course. Some tweaking does need to be done within the department for certain department objectives (Chapters 6 and 8 for example in Math 102 needs some work).

**Goal 3. Time on Task: Dashboard**

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| --- | --- | --- |
| **Math 102** | **Total Hours (Average per student)** | **15 week average** |
| **MML Homework Assignments** | **102** | **408 minutes per week****7 hours per week** |
| **Prerequisite Skills Check Test** | **2** | **15 minutes per week****Saturday or Sunday** |
| **Chapter Review Quiz** | **14** | **105 minutes per week****Less than 2 hours per week** |
| **Monday Mathematics** | **Not tracked** | **2 sessions at 1.5 hours each** |
| **Thursday Labs** | **Not tracked** | **2 hours** |
|  |  |  |
| **Math 108** | **Total Hours (Average per student)** | **15 week average** |
| **MML Homework Assignments** | **70** | **280 minutes per week****approx. 4.5 hours per week** |
| **Prerequisite Skills Check Test** | **3** | **20 minutes per week****Saturday or Sunday** |
| **Chapter Review Quiz** | **10** | **67 minutes per week****approx. 1 hour per week** |
| **Monday Mathematics** | **Not tracked** | **2 sessions at 1.5 hours each** |
| **Thursday Labs** | **Not tracked** | **2 hours** |

**Key Findings**

Historically, for every college credit that a student takes the student should be prepared to spend at least 3 hours outside of the classroom studying and/or working on class assignments or projects. This is a 4 credit class, thus students would need at minimum 12 hours per week to be successful.

The numbers above for Math 102 are based on those students that completed the course (n = 29) of which 86% passed (25/29). Students would need to put in 7 hours per week with homework, 15 minutes on the week-end doing the prerequisite skills check test, 2 hours per week on the weekly quiz, 1 hour 30 minutes in one of the Monday Math sessions and 2 hours in the Thursday lab session. The total comes to 12 hours 45 minutes per week.

The numbers above for Math 108 are based on those students that completed the course in 2 sections (n = 23) of which 87% (20/23) passed. Students would need to put in 4.5 hours per week with homework, 20 minutes on the week-end doing the prerequisite skills check test, 1 hour per week on the weekly quiz, 1 hour 30 minutes in one of the Monday Math sessions and 2 hours in the Thursday lab session. The total comes to 9 hours 20 minutes.

The requirements for both courses are within what is expected of a first year college student. And the time on task includes attending both a session of Monday Mathematics and the Thursday Lab. Many students are fine with just one of those supplemental sessions.

It should be noted that the Monday Mathematics and Thursday Lab session are open and students may come and go as they please. They are to stay for as long as they wish to receive needed assistance of the Math Specialists and tutors.

**Summary**

Students that show up to class, sign into their MyMathLab and to do the work, are persistent, and develop consistent study habits and skills, pass their math courses. The few students who do not show these traits and behaviors do not make it. These preliminary data suggest that the math redesign will be a success, removing a barrier exit-course and shortening students’ time to major declaration without sacrificing rigor and learning.