ALABAMA
GATEWAY MATH OPTIONS GROUP

W. Gary Martin, Auburn University

Panel discussion, Complete College Alabama
“Moving Forward: Game Changers Strategic Planning”

July 20, 2021
Membership

- Megan Good (Auburn), Chair
- Bethany Barnes (Jefferson County Schools)
- Bruce Crawford (Lawson State)
- Brad Fricks (ACCS)
- Hal Fulmer (Troy)
- Jim Gleason (Alabama)
- Michael Green (Shelton State)
- Chuck Holbrook (Calhoun)
- Gary Martin (Auburn/STAMP)
- Robin McGill (ACHE)
- Lora Merchant (Auburn)
- Madhuri Mulekar (South Alabama)
- Shannon Nichols (AGSC/STARS)
- Adrienne Parham (Alabama A&M)
- Eddie Pigg (Southern Union State)
- Keith Roblee (Troy)
- Keith Sessions (AGSC/STARS)
- Wubishet Tadesse (Alabama A&M)
- Shawanda Thomas (Lawson State)
- Sara Wheeler Gadsden State)
AGSC Math Subcommittee

SHARED GOAL

Provide students with an opportunity to learn the quantitative reasoning skills necessary to thrive in the 21st century, that are better aligned with students’ future uses of mathematics

STRATEGY

Give students more quantitative choices in Area III
• Mathematical reasoning skills are needed in the 21\textsuperscript{st} century and should be a central goal for students’ postsecondary mathematics preparation.

• Meanwhile, MTH 112 – Precalculus Algebra is the most commonly-taken mathematics course to meet requirements, even when it is not required by a major.
  • The contribution of that course to developing mathematical reasoning skills is tenuous at best.
  • Moreover, it appears to be a bottleneck for many students.
MTH 098
Elementary Algebra
(Developmental)

MTH 100
Intermediate Algebra
(Satisfies AAS Math Requirement)

MTH 112
Precalculus Algebra
(Satisfies AS Area III Requirement)

MTH 113
Precalculus Trig

MTH 115
Precalculus Algebra & Trig
(Satisfies AS Area III Requirement)

MTH 120
Business Calculus

MTH 125
Calculus I

MTH 125
Calculus I

MTH 231 and/or
MTH 232
Math for Elem Tchrs
(Area V)

MTH 265
Elementary Statistics
(Area V)

MTH 110
Finite Math
(Satisfies AS Area III Requirement)
MTH 112 FOR ACCS STUDENTS

64-70% • The success rate (earned A, B, or C divided by total enrollment) over the last three academic years.

13-14% • Of students who take MTH 112 in an academic year, the percentage that repeat the course at least once within two academic years.

26-27% • Of students who are successful in MTH 112, the percentage that go on to enroll in MTH 113 (Precalculus Trigonometry).

54% • Of students who are successful in MTH 112, the percentage for whom MTH 112 is the final course.
ORIGINAL CHARGE
(August 2020)

• Create new pathways with syllabi and concrete recommendations by the end of the Spring 2021 semester

• Possible way forward:
  • Consider and commit to alternate pathways
  • Create sub-groups to work on specific pathway materials
Committee Musings

Undertook extensive analysis and discussion of the current pathways, alternative approaches in other states, and other ways to better students’ development of relevant mathematical knowledge.

Led to consideration of two major questions:

1. Why are students taking MTH 112 over MTH 110, Finite Math, which would be more useful for many students?
2. What additional courses might be offered? How might they fit in?
   - A new statistics or data literacy course that does not require MTH 100
   - Newly-designed MTH 108, Quantitative Reasoning
   - Redesigned MTH 110
Subgroup 1. Promoting the value of MTH 110

• An initial proposal to rebrand/rename the course name was not well-received.
• Instead, they have embarked on a publicity campaign to inform advisors and students about the benefits of taking Finite Math in those transfer programs that will accept it.
Subgroup 2. Survey of students’ mathematical needs

- The committee had many different ideas of what new courses might be needed based on what has been done elsewhere, but no consensus emerged.
- A similar group in Arkansas conducted a study of the mathematical needs of students in different majors and used the results to propose changes in what initial credit-bearing courses were required for different majors.
  ○ However, they did not reconsider what courses were offered.
- Thus, a subgroup was charged with designing and implementing a survey to better understand the mathematical needs of students in non-mathematics based majors.
Survey Procedure

Step 1. Academic leaders at all two- and four-year IHEs in Alabama were asked to provide a contact name for each degree/certificate program in ACHE’s list of degree for which calculus is not a prerequisite.

- 29 of 38 have fully responded, 4 are nearly complete, and 5 have not responded.

Step 2. A survey was sent out to each contact asking them to rate the importance of a wide range of mathematics concepts, skills, and processes for students in their program.

- Wave 1 went out July 7 to 743 respondents, with a reminder July 14
- Wave 2 went out July 13 to 276 respondents, with a reminder scheduled for July 21.
- Wave 3 will go out July 21 to another 100+ respondents, depending on further responses to Step 1.

Recipients have an opportunity to redirect the survey if they are not the correct contact.
- They can also indicate whether there are tracks within the degree that have different mathematical requirements.
Preliminary Results

As of July 20, 2021, the overall response rate is around 20%. Early results include:

• Less than 25% of the respondents rated algebra, functions, geometry, and set theory as very important for students in their degree program.

• Statistics was rated as more important, with over 45% of the respondents rating several areas of statistics as very important.

• Among mathematical practices, computation rated lowest, while quantitative reasoning and applications were highest.
Next Steps

1. Continue to follow up on data collection through the beginning of August.

2. Analyze the data, looking for distributions of priority mathematical needs across meta-majors and majors.
   * We need more responses to do these kinds of detailed analyses.

3. The committee will then review the results in order to make recommendations on the mathematics courses offered to Alabama’s students:
   a. Are new courses needed?
   b. Should existing courses be refocused or reorganized?
WE NEED YOUR HELP!

We need higher responses rates in order to get a useful data set!