Welcome to AMATYC

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Math Pathways: The Intersection of Policy and Practice

Learners' success in mathematics is essential for obtaining a credential at a community college, and there are promising initiatives underway to support learners' success. Nationwide trends to abandon developmental mathematics courses have affected policy and practice. Attendees will learn how math pathways affected policy and practice within a state system.
History of College Placement

For much of the 20th century, rigid policies with mandates for placement were accompanied by course prerequisite policies, academic probation and progression policies, and other requirements associated with entrance and graduation.
History of College Placement

By the 1970’s, the popularity of such policies was declining and some argued that adult students should have the right to make their own decisions regarding course placement, even if this resulted in failing courses.

By the 1980’s, issues with standardized tests were being debated (IQ tests) on the grounds that they didn’t reflect academic capabilities.

As a result, additional concern regarding placement of disadvantaged groups lead to discussing unintended consequences of placement exams.
History of College Placement

The National Assessment Governing Board (NAGB) has completed several studies regarding standardized tests for math and English. In 2010, a survey of community colleges revealed that 100 percent reported using a standardized test for math and 94 percent for reading placement. This report also noted that the most common placement tools included SAT, ACT, ACCUPLACER and Compass.
History of College Placement

In 2010, the National Center for Higher Education Management Systems completed a 50-state survey of assessment practices and found that only 15 states had a common set of placement tests.
History of College Placement

For any given placement test, there is substantial variation in the cut scores institutions use to identify students as college-ready.

A recent study by Education Commission of the States (March, 2019) concluded that students with similar academic preparation can be assessed and placed differently due to the lack of common criteria for college-course placement and common standards for college-readiness across the states.
History of College Placement

Research focusing on accurate placement has continues. The literature suggests that entry assessments used as a sole measure for course placement are not highly correlated with success in initial college-level courses.

The introduction of pre-degree coursework does not improve college completion rates, but rather extends the time and costs to earn post-secondary credentials.
Emerging Practices

Placing students correctly is crucial – incorrect placement – under placement have unintended consequences to the student.

Used for the sole measure of placement, tests incorrectly place many incoming students and they do not identify non-cognitive factors that may influence student success in college.
Emerging Practices

Research focusing on accurate placement continues. The literature suggests that entry assessments used as a sole measure for course placement are not highly correlated with success in initial college-level courses.

The introduction of pre-degree coursework does not improve college completion rates, but rather extends the time and costs to earn post-secondary credentials.
Emerging Practices

Colleges and college systems have options beyond commonly available placement tests. Based on recent research, options include employing alternative measures, the use of multiple measures and broader conceptions of placement.

Traditional & alternative placement tests, non-cognitive assessments, High school GPA, high school course transcripts, standardized tests (ACT/SAT).
Emerging Practices

Non-cognitive assessments seek to measure students’ psychosocial characteristics. These tests allow colleges to gather information about students that might lead to improved placement and provide students with additional support services.
Emerging Practices

All placement systems require a decision on what constitutes college-readiness. Incorporating various approaches requires analysis to predict the probability of student success in a college-level course using available data (institutional and or system level).
Emerging Issues

A great deal of reform is currently taking place in higher education motivated by concerns about graduation rates, equity, and the costs and benefits of a college education. Changes in assessment and placement practices intersect with other initiatives in ways that can increase both opportunities and challenges.
Emerging Issues – Dev Ed

There is a growing consensus that developmental sequences are too long, with multiple opportunities for students to exit before becoming eligible to enter a college course.

Developmental education reform has impacted course content and pedagogy to promote student engagement and better learning outcomes. These changes will require assessment methods to adapt.
Emerging Issues – Math Pathways

Due to the number of students that fail traditional algebra courses and due to the questions about the relevance of algebra to many students’ goals, math course sequences are changing.

Some would argue that, while all students should possess numeracy skills, many more students would benefit more from quantitative reasoning or statistics courses than a traditional college algebra course.
Emerging Issues – Guided Pathways

Guided pathways are today more normative. Designed to encourage students to choose a specific curricular pathway, general education courses and discipline specific courses align within the same meta-major. Outside of the specific meta-major, mathematic and science courses may differ.
Emerging Issues – Super Scores

Beginning in September 2020, ACT will allow students dissatisfied with their ACT scores to retake a selected portion of the college admission test without having to repeat the entire exam.

Students must take the full ACT exam before they can choose a partial retake of one or more sections.
Emerging Issues – ACT Scores

Beginning in September 2020, ACT will allow students to choose to send colleges an official score report.

**OPTION 1**
ACT Score

Send the most recent Composite score.

**OPTION 2**
ACT Superscore

Send the Superscore (the average of all your best section scores).
Emerging Issues – Policy

Different definitions of college readiness can lead to confusing messages for K-12 educators, students and their parents.

The more decentralized the policy decisions about assessment and placement, the more likely there will be diverse ways of thinking about and measuring college readiness.
Implications

Bracco, Dadgar, Austin, Klarin, Broek, Finklestien, Mundry and Bugler, 2014 stated

“The choice to broaden placement policy to include multiple measures become a single standardized test score involves trade-offs, including potential trade-offs between precision and costs, test validity and face validity, and local policy variation and uniform statewide implementation.”
Oklahoma’s State System Reforms

Oklahoma State Regents for Higher Education have identified college completion as their No. 1 goal and are working to increase the number of degrees and certificates earned in Oklahoma by 67 percent by 2023.

Multiple initiatives:
- Institutional Degree Completion Plans/Academic Plans
- Complete to Compete
- 15 to Finish
- Math Success Initiative
- Reverse Transfer
- Cooperative Agreement Programs
In 2012, OSRHE held a Remedial Reform Summit and Mathematics Faculty Conference to discuss success rates in remedial and gateway mathematics courses.

- Remediation:
  - 40% of post-secondary students require remediation.
  - 60% of students entering community colleges require remediation.
  - 23% of students complete gateway course within two years.
  - 11% of students graduate within three years.
The Mathematics Success Group, which consists of 35 mathematics faculty, department chairs and teacher educators, began meeting in 2013 to develop a strategic plan and obtained feedback from state and national groups. Priorities of the strategic plan included:

1. Improve preparation of high school students and college transition;
2. Reform remediation;
3. Improve course placement; and
4. Create multiple math pathways based upon metmajors
Math Options

In November 2015, the Mathematics Pathways to Completion program of the University of Texas Charles A. Dana Center invited Oklahoma to join five other states and receive support and consultation in pursuing math pathways for the State System.

- Oklahoma drafted a statewide, multi-year plan to guide long-term implementation of math pathways;
- Oklahoma math faculty successfully created four gateway general education courses;
- 100% of higher education institutions have implemented at least two math pathways; and
- Continued efforts are in place such that at least 50% of programs will be aligned to the appropriate math pathways.
Gateway Courses

Each institution has implemented its own variant of multiple mathematics pathways, building from its particular history, program offerings, and institutional priorities.

• Oklahoma mathematics faculty successfully developed four gateway mathematics courses that will more efficiently serve all students.

• Making college algebra the default introductory math course was a disservice both to students who needed higher-level math in their STEM majors and to students whose programs required statistics or math reasoning skills.

• College mathematics requirements are changing in response to the evolving needs of students, the economy, and society at large. For decades, the traditional algebra- and calculus-based sequences were regarded as the best route for almost all students in higher education, regardless of their major. Today, that is no longer the case.
Advising Strategies

Each institution has had to rethink student advising practices and policies. Efforts to develop degree maps that clearly define prescribed curriculums vs exploratory majors is ongoing work.

- In 2015, OSRHE approved a revised assessment and remediation policy with two significant changes from previous policies.
  1. Identify assessments that more accurately describe a student’s chance at success in entry-level courses.
  2. Allow remediation to be offered through a variety of mechanisms, including the co-requisite model.
Co-Requisite Models

OK public institutions of higher education have meet the following goals:

- **100%** of all public institutions of higher education offer at least one co-requisite mathematics course;
- Oklahoma public institutions of higher education have incorporated the **use of multiple measures** to adequately support students with curricular deficiencies in mathematics; and
- Completion rates in gateway Math/English courses will continue to be studied and analyzed for potential modifications.
Meta-Majors

Although there is universal support of mathematics pathways, Oklahoma needs assistance with developing structures that will yield collaboration across institutions and develop into normative practice.

Our goal is to develop a clear alignment of mathematics pathways to degrees (across institutions leading to state wide alignment). Identify one default or recommended gateway math requirement based on the meta-majors determined by the regional university/college.
Results

Course pass rates for College Algebra have held steady. Overall enrollments have dropped to suggest more students are being placed in alternative general education mathematics courses.

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<tbody>
<tr>
<td>Pass Rate</td>
<td>70.1%</td>
<td>71.0%</td>
<td>71.1%</td>
<td>72.5%</td>
<td>70.6%</td>
<td>71.7%</td>
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<td>Total Enrollments</td>
<td>25,651</td>
<td>25,461</td>
<td>26,899</td>
<td>26,932</td>
<td>23,208</td>
<td>17,635</td>
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Results

Although the existing data is new and represents just 7 institutions, the course pass rates for co-requisite models is promising – near 70%. Enrollment numbers suggest more students are completing a college-level course without the need of traditional remediation.

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<tr>
<th>Co-Requisite Math Course Pass Rates (not the lab component)</th>
<th>2018-2019</th>
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<tbody>
<tr>
<td>College Algebra</td>
<td>68.7%</td>
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<tr>
<td>General Education</td>
<td>66.6%</td>
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<tr>
<td>Math Statistics</td>
<td>78.8%</td>
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<tr>
<td>Total Pass Rate</td>
<td>69.4%</td>
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<tr>
<td>Total Enrollments</td>
<td>2,396</td>
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Results

Although the course pass rates for traditional remediation courses and remains flat near 60%. Enrollment numbers suggest more students are not required to complete traditional remediation course.

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<tr>
<td>Pass Rate</td>
<td>58.2%</td>
<td>59.9%</td>
<td>60.5%</td>
<td>61.0%</td>
<td>61.4%</td>
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<td>Total Enrollments</td>
<td>32,329</td>
<td>29,386</td>
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<td>19,563</td>
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Discussion and Questions
Thank you for joining me today.

Dr. Rachel Bates

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