Guiding a System along a Pathways' Journey

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Tennessee Board of Regents
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Creating a Clear Path to Success
REALIGNMENT OF MATHEMATICS PATHWAYS

Now affirmed by the Conference Board of Mathematical Sciences
ARCHITECTED PROGRAM CHOICE
Now watch them decide a major…
Enrollment Patterns for Incoming University Freshmen

Freshmen 2013-14
- Declared: 68%
- Undeclared: 32%

Freshmen 2015-16
- Declared: 83%
- Undeclared: 17%
How did the existence of academic foci affect student program choice?

**Why did you pick your program or academic focus?**

- 78% My interests lie in this area
- 7% I know someone who majored or works in this field
- 5% My parents or an advisor suggested this choice
- 6% The salary potential is attractive to me
- 3% I have not selected a final major yet
- 1% I had to pick something
Focus Courses
The effect of course enrollments in the first year on Community College graduation rates

- 1st yr - Did not attempt 9hrs in focus area
- 1st yr - Attempted 9hrs in focus area
- 1st yr - Earned 9hrs in focus area

6 yr Graduation Rates:
- 16%
- 34%
- 40%

0% 10% 20% 30% 40% 50%
The effect of course enrollments in the first year on the University graduation rates

- **1st yr - Did not attempt 9hrs in focus area**: 30%
- **1st yr - Attempted 9hrs in focus area**: 46%
- **1st yr - Earned 9hrs in focus area**: 53%

6 yr Graduation Rates

0% 15% 30% 45% 60%
10,000 Community College Students

5,000 who attempted 3 focus courses in their first year and 5,000 who did not.
10,000 Community College Students

5,000 who attempted 3 focus courses in their first year and 5,000 who did not.
## Perceived Purpose of Coursework

<table>
<thead>
<tr>
<th></th>
<th>Low Perception</th>
<th>High Perception</th>
<th>Difference</th>
<th>Effect size</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Math Class Success Rate</strong></td>
<td>60.2%</td>
<td>66.5%</td>
<td>6.3pp</td>
<td>2.08</td>
</tr>
<tr>
<td><strong>Writing Class Success Rate</strong></td>
<td>61.3%</td>
<td>70.8%</td>
<td>9.5pp</td>
<td>3.73</td>
</tr>
<tr>
<td><strong>Earned Hour%</strong></td>
<td>65.1%</td>
<td>72.5%</td>
<td>7.4pp</td>
<td>4.85</td>
</tr>
<tr>
<td><strong>Fall to Spring Retention Rate</strong></td>
<td>72.4%</td>
<td>77%</td>
<td>4.6pp</td>
<td>2.62</td>
</tr>
</tbody>
</table>
Since 2013...

- Community College 3yr Graduation Rate: 42%
- University 4yr Graduation Rate: 26%
Since 2013...

Community College 3yr Graduation Rate: 88%

University 4yr Graduation Rate: 51%

Under-represented Minority Students
System-wide Math Completion for students beginning in Developmental Mathematics

ACT Math Subscores

Prepare for Credit Model
System-wide Math Completion for students beginning in Developmental Mathematics

ACT Math Subscores

- 10 Standard Deviations
- Prepare for Credit Model
- Direct Credit
Co-requisite Remediation

PROTOTYPE

Mathematics - 9 Community Colleges 1019 students
Writing - 7 Community Colleges, 957 students
Coherence
not Uniformity
Co-requisite Remediation

Full System Implementation
Fall 2015
Completion of Gateway Math by ACT Sub-score
Community College Pre-requisite Model vs. Co-requisite Model

Results of TBR Co-requisite Full Implementation

<table>
<thead>
<tr>
<th>Sub-score</th>
<th>Pre-requisite Model</th>
<th>Co-requisite Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;14</td>
<td>2.7%</td>
<td>2.7%</td>
</tr>
<tr>
<td>14</td>
<td>3.8%</td>
<td>3.8%</td>
</tr>
<tr>
<td>15</td>
<td>6.8%</td>
<td>6.8%</td>
</tr>
<tr>
<td>16</td>
<td>11.5%</td>
<td>11.5%</td>
</tr>
<tr>
<td>17</td>
<td>19.7%</td>
<td>19.7%</td>
</tr>
<tr>
<td>18</td>
<td>25.6%</td>
<td>25.6%</td>
</tr>
<tr>
<td>No ACT</td>
<td>13.1%</td>
<td>13.1%</td>
</tr>
<tr>
<td>Total</td>
<td>51.7%</td>
<td>51.7%</td>
</tr>
</tbody>
</table>

9479 Students

7422 Students
Completion of Gateway Math by ACT Sub-score
University “MATH1000” Model vs. Co-requisite Model

Results of TBR Co-requisite Full Implementation

- Full Implementation - Fall 2015
- Full Implementation Fall & Spring 2015-16

<table>
<thead>
<tr>
<th>Year</th>
<th>Full Implementation - Fall 2015</th>
<th>Full Implementation Fall &amp; Spring 2015-16</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;14</td>
<td>32.1%</td>
<td>59.6%</td>
</tr>
<tr>
<td>14</td>
<td>44.6%</td>
<td>47%</td>
</tr>
<tr>
<td>15</td>
<td>56%</td>
<td>52%</td>
</tr>
<tr>
<td>16</td>
<td>55.7%</td>
<td>63%</td>
</tr>
<tr>
<td>17</td>
<td>70.4%</td>
<td>72%</td>
</tr>
<tr>
<td>18</td>
<td>79.1%</td>
<td>82.5%</td>
</tr>
<tr>
<td>Total</td>
<td>75.0%</td>
<td>67%</td>
</tr>
</tbody>
</table>

3335 Students vs. 2803 Students
Co-requisite Remediation

Disaggregation
Completion of Gateway Math by ACT Sub-score
Community College Pre-requisite Model vs. Co-requisite Model

Results of TBR Co-requisite Full Implementation - URM Students
Completion of Gateway Math by ACT Sub-score
Community College Pre-requisite Model vs. Co-requisite Model

Results of TBR Co-requisite Full Implementation - Adult

- <14: 4.5% (Full Implementation - Fall 2015), 11.0% (Full Implementation Fall & Spring 2015-16)
- 14: 47.1% (Full Implementation - Fall 2015), 45.3% (Full Implementation Fall & Spring 2015-16)
- 15: 39.2% (Full Implementation - Fall 2015), 48.9% (Full Implementation Fall & Spring 2015-16)
- 16: 59.1% (Full Implementation - Fall 2015), 64.5% (Full Implementation Fall & Spring 2015-16)
- 17: 23.6% (Full Implementation - Fall 2015), 72.5% (Full Implementation Fall & Spring 2015-16)
- 18: 20.7% (Full Implementation - Fall 2015), 69.0% (Full Implementation Fall & Spring 2015-16)
- No ACT: 6.5% (Full Implementation - Fall 2015), 44.6% (Full Implementation Fall & Spring 2015-16)
- Total: 52.3% (Full Implementation - Fall 2015), 57.6% (Full Implementation Fall & Spring 2015-16)
Completion of Gateway Math by ACT Sub-score

University Pre-requisite Model vs. Co-requisite Model

Results of TBR Co-requisite Full Implementation - URM Students

<table>
<thead>
<tr>
<th></th>
<th>Pre-requisite Model AY 2012-13</th>
<th>Full Implementation Fall &amp; Spring 2015-16</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;14</td>
<td>22.2%</td>
<td>57.0%</td>
</tr>
<tr>
<td>14</td>
<td>52.5%</td>
<td>63.0%</td>
</tr>
<tr>
<td>15</td>
<td>52.8%</td>
<td>62.0%</td>
</tr>
<tr>
<td>16</td>
<td>62.2%</td>
<td>69.0%</td>
</tr>
<tr>
<td>17</td>
<td>74.0%</td>
<td>79.0%</td>
</tr>
<tr>
<td>18</td>
<td>77.3%</td>
<td>81.0%</td>
</tr>
<tr>
<td>Total</td>
<td>64.0%</td>
<td>73.0%</td>
</tr>
</tbody>
</table>
Completion of Gateway Math by ACT Sub-score
Community College Pre-requisite Model vs. Co-requisite Model
Community College students who passed a Math class in their 1st Year

Fall to Fall Retention

- Pre-requisite Model: 47%
- Co-requisite Model: 63%

Earned Credit Hours

- Pre-requisite Model: 19.1 SCH
- Co-requisite Model: 22.6 SCH

Pre-requisite Model: 18%
Co-requisite Model: 33%
Average Community College Instructional Cost per Successful Student in Mathematics

<table>
<thead>
<tr>
<th></th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-requisite Model</td>
<td>$3,088.00</td>
</tr>
<tr>
<td>Co-requisite Model</td>
<td>$1,536.00</td>
</tr>
</tbody>
</table>

Is Corequisite Remediation Cost-Effective? Early Findings From Tennessee Belfield, Davis & Lahr, Community College Research Center, Columbia University
Students who Failed Both Courses

Earned Hours

Hours Earned by Full Time Students

<12 12 13 14 15 16 17 18 No ACT

0hrs 1-3hrs 4-6hrs 7-9hrs 10-12hrs 13-15hrs 16-18hrs 19-21hrs 22+hrs
What steps towards implementing Math Pathways have you already begun?
What barriers do you face to implement **Math Pathways** in your institution?
What would you need to know about co-requisite remediation to consider it for your students?
Thank you

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