Strategic Redesign of Gateway Mathematics

Prof. Loretta Blanchette, Sr. Associate Professor, MDC Hialeah Campus
Dr. Roger Isaac Blanco, Director of Pedagogy, First in the World Math Grant
Prof. Lourdes España, Sr. Associate Professor, MDC North Campus
### Key Areas of Strategic Redesign

<table>
<thead>
<tr>
<th>Area</th>
<th>Strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scaling of non-algebra pathway</td>
<td>• MAT0029/MGF1106</td>
</tr>
<tr>
<td></td>
<td>• MGF1107/MGF1106</td>
</tr>
<tr>
<td>Redesign of Intermediate Algebra (MAT1033)</td>
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## Key Areas of Strategic Redesign

| Scaling of non-algebra pathway | MAT0029/MGF1106  
|                               | MGF1106/MGF1107 |
| Redesign of Intermediate Algebra (MAT1033) |  
| Additional redesign of MAT1033 with contextualized and co-requisite curriculum |  
|                                               | Active classroom learning  
|                                               | Embedded learning assistants  
|                                               | Early Alerts and Intervention strategies  
|                                               | Contextualized Curriculum  
|                                               | Embedded Instructional Learning Assistants (ILAs)  
|                                               | Early Alerts and Intervention Strategies |
Which students will the Non-Algebra Pathways serve?

• Students with **programs of study that do not** require College Algebra for degree, transfer / baccalaureate
Non-Algebra = MGF
Mathematics, General & Finite
Sequences That Work

MAT 0029
- Algebra Topics
- No Credit

MGF 1106
- Liberal Arts I
- 3 Credits

MGF 1107
- Liberal Arts II
- 3 Credits

STAT 2023
- Statistics
- 3 Credits

MGF 1107
- Liberal Arts II
- 3 Credits

MGF 1106
- Liberal Arts I
- 3 Credits

STA 2023
- Statistics
- 3 Credits
## Pass Rates in Gateway Mathematics

<table>
<thead>
<tr>
<th>Course</th>
<th>Fall 13 Pass Rate</th>
<th>Fall 14 Pass Rate</th>
<th>Fall 15 Pass Rate</th>
<th>Fall 16 Pass Rate</th>
<th>Fall 17 Pass Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAT0029 Developmental</td>
<td>90.8%</td>
<td>78.0%</td>
<td>83.1%</td>
<td>80.2%</td>
<td>82.0%</td>
</tr>
<tr>
<td>MGF1106 Required for Degree</td>
<td>70.4%</td>
<td>70.0%</td>
<td>72.0%</td>
<td>70.9%</td>
<td>70.0%</td>
</tr>
</tbody>
</table>

*Gateway math: MAT0029, MGF1106  
Pass rate = (A+B+C)/(All Grades)  
Source: MDC Institutional Research analysis using OBIEE data retrieved on 01/08/18
Statistics STA2023

• 3.0 Credits
• Following Semester
• Healthy Enrollment
• Mix of Algebra & Non-Algebra Majors
## Pass Rates in Statistics (STA2023)

<table>
<thead>
<tr>
<th>Course</th>
<th>Fall 13 Pass Rate</th>
<th>Fall 14 Pass Rate</th>
<th>Fall 15 Pass Rate</th>
<th>Fall 16 Pass Rate</th>
<th>Fall 17 Pass Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>STA2023</td>
<td>72%</td>
<td>72%</td>
<td>73%</td>
<td>72%</td>
<td>73%</td>
</tr>
</tbody>
</table>

Pass rate = (A+B+C)/(All Grades)

Source: MDC Institutional Research analysis using OBIEE data retrieved on 01/08/18
My Organizations

Organizations where you are: Participant

CIOL Design Your Own Spring Break: Technology

CIOL Workshop and User Group Org
Announcements:
› BBL2000-46– Blackboard Grade Center Workshop, Saturday, April 7, 2018, Wolfson Campus, 9:00 AM - 12:00 PM

Fulbright Scholars Programs

MAT0029/MTF1106 BBL ORG. (Math to Stats)

Mathematics Repository ORG.

Office of International Education

Institution Discussion Boards

No Discussion Boards have been selected for display.

Organization Catalog

Campus Communities
Content Area

MATH-TO-STATS Training Agenda 8-17-16

Training PPT: Math to Stat Pathway

MAT 0029 MGF 1106 Syllabus - Update 8-2016

MAT 0029 Material

MGF 1106 Material
# Key Areas of Strategic Redesign

<table>
<thead>
<tr>
<th>Area</th>
<th>Details</th>
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<tbody>
<tr>
<td>Scaling of non-algebra pathway</td>
<td>- MAT0029/MGF1106&lt;br&gt;  - MGF1106/MGF1107</td>
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<td>- Active classroom learning&lt;br&gt; - Embedded learning assistants&lt;br&gt; - Early Alerts and Intervention strategies</td>
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<td>Additional redesign of MAT1033 with contextualized and co-requisite</td>
<td>- Contextualized Curriculum&lt;br&gt; - Embedded Instructional Learning Assistants (ILAs)&lt;br&gt; - Early Alerts and Intervention Strategies</td>
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</table>

**Note:** The table above outlines the key areas of strategic redesign with specific examples of implementation strategies.

**Source:** Miami Dade College
## MAT1033 Performance Data

<table>
<thead>
<tr>
<th>Redesign Status and Session Code</th>
<th>Fall 2016</th>
<th></th>
<th></th>
<th>Fall 2017</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number of Sections</td>
<td>Sum of Headcount</td>
<td>(A+B+C)/Headcount</td>
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<td>(A+B+C)/Headcount</td>
</tr>
<tr>
<td>Redesigned</td>
<td>80</td>
<td>2,578</td>
<td>63.5%</td>
<td>99</td>
<td>2,984</td>
<td>61.7%</td>
</tr>
<tr>
<td>1</td>
<td>80</td>
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<tr>
<td>Traditional</td>
<td>156</td>
<td>4,470</td>
<td>56.0%</td>
<td>205</td>
<td>5,214</td>
<td>55.2%</td>
</tr>
<tr>
<td>1</td>
<td>90</td>
<td>2,830</td>
<td>56.1%</td>
<td>122</td>
<td>3,666</td>
<td>52.6%</td>
</tr>
<tr>
<td>12W</td>
<td>13</td>
<td>366</td>
<td>47.8%</td>
<td>16</td>
<td>282</td>
<td>48.9%</td>
</tr>
<tr>
<td>14W</td>
<td>3</td>
<td>59</td>
<td>40.7%</td>
<td>4</td>
<td>125</td>
<td>53.6%</td>
</tr>
<tr>
<td>8W1</td>
<td>7</td>
<td>139</td>
<td>71.9%</td>
<td>7</td>
<td>139</td>
<td>66.2%</td>
</tr>
<tr>
<td>8W2</td>
<td>40</td>
<td>981</td>
<td>56.4%</td>
<td>49</td>
<td>852</td>
<td>66.0%</td>
</tr>
<tr>
<td>WKD</td>
<td>3</td>
<td>95</td>
<td>65.3%</td>
<td>7</td>
<td>150</td>
<td>60.0%</td>
</tr>
<tr>
<td>Grand Total (Redesigned + Traditional)</td>
<td>236</td>
<td>7,048</td>
<td>58.7%</td>
<td>304</td>
<td>8,198</td>
<td>57.5%</td>
</tr>
</tbody>
</table>

Source: MDC Institutional Research analysis using OBIEE data retrieved 01/30/18
Need for Gateway Course
MAT1033 Redesign

<table>
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<th>Highest enrollment math course with highest failure rate</th>
<th>Pass rates dropped significantly after Florida’s SB1720 passed in 2014</th>
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<tr>
<td>Approximately half of MAT1033 students are repeaters</td>
<td>Passing math is essential for retention, success and completion</td>
</tr>
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</table>
MAT1033 REDESIGN Strength

Professional Development of Course Materials & Syllabus

Streamlined Curriculum

Students Engaged in Active Learning
MAT1033 REDESIGN
MAT1033 REDESIGN Support

Math Lab Component

One Assigned LEARNING ASSISTANT

Common Syllabus Allows for Common TEST REVIEW (Mastery Sessions) in Lab
MASTERY Review in Math Lab
MAT1033 REDESIGN Key

Early Alerts & Interventions

Technology Assistance

Professor & Learning Assistant Collaborate to Provide Individual Remediation
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</tr>
<tr>
<td><strong>MAT1033 Total</strong></td>
<td><strong>57.3%</strong></td>
<td><strong>50.5%</strong></td>
<td><strong>52.8%</strong></td>
<td><strong>58.7%</strong></td>
<td><strong>57.5%</strong></td>
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<tr>
<td>MAT1033 Non-Redesign</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>53.6%</td>
<td>56.0%</td>
<td>55.2%</td>
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<td></td>
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*Gateway math: MAT0029, MGF1106, MAT1033
Pass rate = (A+B+C)/(All Grades)
Source: MDC Institutional Research analysis using OBIEE data retrieved on 01/08/18
Assessing Success of MAT1033 Overall

Before Senate Bill
57.3% Passing

After Senate Bill
50.5% Passing

Year 4
57.5% Passing
Assessing Success of MAT1033 REDESIGN

Before Senate Bill
57.3% Passing

After Senate Bill
50.5% Passing

REDESIGN Year 3
61.7% Passing
Impact of MAT1033 REDESIGN

- 7 Campuses
- 150+ Faculty Trained
- 3,000 students/Fall Semester
- ~1,000 more students pass/year

Scaled College-wide
Good Practices of MAT1033
Transfers to . . .

Other math courses
Gateway Chemistry
General Accounting
Further, Possible Impact of MAT1033 REDESIGN

• Other high enrollment, low pass rate courses may be similarly redesigned
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Research Basis for CONTEXTUALIZATION

Facilitating Student Learning
Perin (2011)

Transfer of Deep Learning

Quantitative Reasoning
Boursema (2011)
Curriculum CONTEXTUALIZED

High Enrollment Majors

- Team Meetings
- Writing in Pairs
- Publish & Use

Cyclical Mastery—Consumable Course Materials:

- Student Text
- Co-Requisites
- Performance Tasks
- College Algebra-Ready
Professor + ILA

• PLANNING Content & Delivery (up to 1 hour/wk)

• Division of Labor
  • for Projection
  • Use of Formative Assessment (Excel files)

• Quizzes or Plickers or Review Activities
Professor + ILA

- Embedded in Classroom
- Roving During “Gradual Release”
- Noting Whose Attention Flags at Which Content
- Assisting Students Whom the Professor Identifies as High Demand
RECITATION HALL
Intermediate Algebra Lab

• WHAT IT LOOKS LIKE
  • Field Questions Based on What Was Just Taught by Professor
  • Collaboration on Co-requisite Material
  • Student Defends Process & Solution(s)
  • Out of Their Seats at Boards

• Fun, but Forced Practice
• Retrieval
RECITATION HALL
Intermediate Algebra Lab

• GOALS: True Competency for College Algebra-Ready & Beyond
• Academic Belonging
• Informal Cohort
• Public Confidence
• Entity Mindset
Student Success

Advisor: EARLY ALERT

ILA: INTERVENTION

Professor & Grant Staff
Multiple Approaches & Multiple Methods for Feedback

Whole Class -> Group Learning -> One-on-One Tutoring

Practice Tests -> Scores -> Remediation
## Pass Rates in Gateway Mathematics

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<td>72.0%</td>
<td>70.9%</td>
<td>70.0%</td>
</tr>
<tr>
<td>MAT1033 Total</td>
<td>57.0%</td>
<td>58.3%</td>
<td>52.8%</td>
<td>58.7%</td>
<td>51.4%</td>
</tr>
<tr>
<td>MAT1033 Non-Redesign</td>
<td></td>
<td>53.6%</td>
<td>56.0%</td>
<td>55.2%</td>
<td></td>
</tr>
<tr>
<td>MAT1033 Redesign</td>
<td></td>
<td></td>
<td>51.8%</td>
<td>63.0%</td>
<td>61.7%</td>
</tr>
<tr>
<td>MAT1033 Contextualized</td>
<td></td>
<td></td>
<td></td>
<td>73.9%</td>
<td></td>
</tr>
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*Gateway math: MAT0029, MGF1106, MAT1033  
Pass rate = (A+B+C)/(All Grades)  
Source: MDC Institutional Research analysis using OBIEE data retrieved on 01/08/18*
Preliminary results of MAT1033 CONTEXTUALIZED are promising . . .

• In the Fall of 2017, our study looked at a total of 337 Business Majors.

• Students were enrolled by randomized selection into one of 12 sections, 6 Control and 6 Intervention at the Kendall Campus of Miami Dade College.

• Instructors, a mixture of full and part-time faculty, were also randomly assigned.

• Overall, students in the Intervention Classes who received the contextualized curriculum, the embedded ILA, and the Recitation Hall had a significantly higher pass rate.
### Fall 2017 (2177) MAT1033 Performance

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>F</th>
<th>Pass Rate</th>
<th>Success Rate</th>
<th>Retention Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intervention Group</td>
<td>38</td>
<td>50</td>
<td>34</td>
<td>10</td>
<td>26</td>
<td>73.9%</td>
<td>77.2%</td>
<td>95.8%</td>
</tr>
<tr>
<td>Control Group</td>
<td>33</td>
<td>36</td>
<td>35</td>
<td>19</td>
<td>24</td>
<td>66.2%</td>
<td>70.7%</td>
<td>93.6%</td>
</tr>
<tr>
<td>Kendall Campus</td>
<td>550</td>
<td>527</td>
<td>538</td>
<td>228</td>
<td>642</td>
<td>60.1%</td>
<td>65.0%</td>
<td>92.6%</td>
</tr>
<tr>
<td>College-wide</td>
<td>1,560</td>
<td>1,520</td>
<td>1,612</td>
<td>715</td>
<td>1,682</td>
<td>57.5%</td>
<td>67.0%</td>
<td>88.0%</td>
</tr>
</tbody>
</table>

Pass Rate: \(\frac{(A+B+C)}{\text{Total Grades}}\)
Success Rate: \(\frac{(A+B+C+S)}{\text{Total Grades} - \text{Withdrawals}}\)
Retention Rate: \(\frac{(A+B+C+D+F+S+P+U+I)}{\text{Total Grades}}\)

I: Incomplete
P: Progress
W: Withdraw
S: Success
U: Unsatisfactory

#### 2177_MAT1033 Performance Comparison

- **Pass Rate**
  - Intervention Group: 73.9%
  - Control Group: 66.2%
  - Kendall Campus: 77.2%
  - College-wide: 57.5%

- **Success Rate**
  - Intervention Group: 77.2%
  - Control Group: 70.7%
  - Kendall Campus: 55.0%
  - College-wide: 67.0%

- **Retention Rate**
  - Intervention Group: 95.8%
  - Control Group: 93.6%
  - Kendall Campus: 92.6%
  - College-wide: 88.0%
# Pass Rates in Gateway Mathematics

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</tr>
<tr>
<td>MGF1106 Non-algebra</td>
<td>70.4%</td>
<td>70.0%</td>
<td>72.0%</td>
<td>70.9%</td>
<td>70.0%</td>
</tr>
<tr>
<td>MAT1033 OVERALL</td>
<td>57.3%</td>
<td>50.5%</td>
<td>52.8%</td>
<td>58.7%</td>
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<td>MAT1033 Redesign</td>
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<td>61.7%</td>
</tr>
<tr>
<td>MAT1033 Contextualized</td>
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# MAT1033 Performance Data

<table>
<thead>
<tr>
<th>Redesign Status and Session Code</th>
<th>Fall 2016</th>
<th></th>
<th>Fall 2017</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number of Sections</td>
<td>Sum of Headcount</td>
<td>(A+B+C)/Headcount</td>
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<td>Redesigned</td>
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<td>2,578</td>
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Source: MDC Institutional Research analysis using OBIEE data retrieved 01/30/18
Questions?
To continue the conversation . . .

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Prof. Lourdes España
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