Multiple Measures Assessment Project (MMAP)

CAI Regional Meeting
July 29, 2016
Loris Fagioli, PhD

http://www.rpgroup.org/projects/multiple-measures-assessment-project
MMAP Project Overview

Collaboration
- CAI
- Cal-PASS+
- RP Group
- >45 CCs
- University of Michigan

Model Development
- English
- Math
- ESL
- Reading
- Chemistry
- Biology
- Non-cognitive
- Self-reported
- Etc.

Engagement
- Local replication
- Webinars
- PDs
- Support to CCs
- Local Replication
- Pilot results

bit.ly/MMAP2015
Figure 2. Statewide progression of students from three levels below transfer to transfer-level math from fall 2010 through spring 2013.
Classical Test Theory

Observed score = True score + error

\[
O = T + e
\]

GPA/Achievement

\[
N(0, 1)
\]
Predictive validity of Tests
(transfer level)

<table>
<thead>
<tr>
<th>Test</th>
<th>Correlation with Grade Point</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accuplacer – English</td>
<td>.10</td>
</tr>
<tr>
<td>Accuplacer – Math</td>
<td>.09 - .19</td>
</tr>
</tbody>
</table>

![Graph showing scatter plot with fitted line](image)
Growing body of evidence

- **Weak relationship** between assessment tests and college course outcomes: bit.ly/CCRCAssessment

- **Incredible variability** in cut scores: CCs often use HIGHER cut scores than 4-year: bit.ly/NAGB2012

- **Underestimates** students of color, women, first generation college students, low SES: bit.ly/DefiningPromise

- **Long thread of research in the CCCs**
  - Hetts, Fuenmayor, & Rothstein, 2012 http://www.lbcc.edu/PromisePathways
Why Multiple Measures?

• Tests have been under-placing students
• Multiple measures
  • provide a more complete picture of student ability
  • provide a way to increase the accuracy of placement, particularly reducing underplacement
  
• are required by law

Effort (HW, on time …)
Time management
Life-Work balance
Etc.

\[ O = T + e \]

Observed score = True score + error

GPA/Achievement
### Predicting transfer-level grades

**Test vs GPA**

<table>
<thead>
<tr>
<th>Test</th>
<th>Correlation with GPs</th>
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<td>Accuplacer – English</td>
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</tr>
<tr>
<td>Accuplacer – Math</td>
<td>.09 - .19</td>
</tr>
<tr>
<td>11(^{th}) Grade GPA - English</td>
<td>.37</td>
</tr>
<tr>
<td>11(^{th}) Grade GPA – Math</td>
<td>.38</td>
</tr>
</tbody>
</table>
Variables Explored in the MMAP Models

- High School Cumulative GPA
- Grades in high school courses
- CST scores
- Advanced Placement course taking
- Taking higher level courses (math)
- Delay between HS and CCC (math)
- etc.
## Transfer Level Rule Sets

<table>
<thead>
<tr>
<th>Transfer Level Course</th>
<th>Direct Matriculant</th>
<th>Non-Direct Matriculant</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>College Algebra</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Passed Algebra II (or better)</td>
<td>HS 11 GPA &gt;=3.2</td>
<td>HS 12 GPA&gt;=3.2</td>
</tr>
<tr>
<td></td>
<td>HS 11 GPA &gt;=2.9 AND Pre-Calculus C (or better)</td>
<td>HS 12 GPA&gt;=3.0 AND Pre-Calculus C (or better)</td>
</tr>
<tr>
<td>N=216,420</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Statistics</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Passed Algebra I (or better)</td>
<td>HS 11 GPA &gt;= 3.0</td>
<td>HS 12 GPA &gt;= 3.0</td>
</tr>
<tr>
<td></td>
<td>HS 11 GPA &gt;= 2.3 AND Pre-Calculus C (or better)</td>
<td>HS 12 GPA &gt;= 2.6 AND Pre-Calculus C (or better)</td>
</tr>
<tr>
<td>N=216,420</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>English</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>HS 11 GPA &gt;= 2.6</td>
<td>HS 12 GPA &gt;= 2.6</td>
</tr>
<tr>
<td>N=347,332</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Potential Statewide Impact

English Transfer:
- Historic: 37%
- MMAP disjunctive: 59%

Math Transfer:
- Historic: 26%
- MMAP disjunctive: 37%
Potential Impact on Equity (Math Transfer Level)
Common Concerns about MMAP

- Students placed via MMs will not be successful
- Our courses will have lower pass rates
- Our test is different
- Students would be better off in remedial coursework
- We are only looking at GPA
- Students will only get a “C” in transfer-level work
- Students who get a “C” in transfer-level won’t be able to transfer
- High school GPA is only good for recent graduates
Success Story: Sierra College

- Fall 2011: 72%
- Fall 2012: 73%
- Fall 2013: 70%
- Fall 2014 - Accuplacer: 73%
- F14 HS Data: 79%
Success Story: Cañada College

<table>
<thead>
<tr>
<th></th>
<th>Compass</th>
<th>MMAP + Compass</th>
</tr>
</thead>
<tbody>
<tr>
<td>English Transfer</td>
<td>N = 66</td>
<td>N = 170</td>
</tr>
<tr>
<td>Math Transfer</td>
<td>N = 70</td>
<td>N = 116</td>
</tr>
<tr>
<td>Success Rate</td>
<td>75%</td>
<td>78%</td>
</tr>
<tr>
<td>Math Success Rate</td>
<td>68%</td>
<td>67%</td>
</tr>
</tbody>
</table>
Success Story: Bakersfield

Success Rate at Transfer Level

<table>
<thead>
<tr>
<th>Course</th>
<th>Test placed</th>
<th>MIH placed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engl Transfer</td>
<td>69%</td>
<td>77%</td>
</tr>
<tr>
<td>Math Transfer</td>
<td>60%</td>
<td>68%</td>
</tr>
</tbody>
</table>
Success Story: San Diego

Pass rates in transfer level Math

- College Algebra: 58% (District) vs. 67% (MMAP)
- Statistics: 64% (District) vs. 61% (MMAP)
- Trigonometry (Pre-calc): 51% (District) vs. 63% (MMAP)
- Liberal Arts Math: 67% (District) vs. 67% (MMAP)

Legend:
- Orange: District pass rates (Spring 2015)
- Green: MMAP pass rates (entire sample) - Fall 2015
Our tests are different – IVC Tests
(correlations with transfer level grade point)

<table>
<thead>
<tr>
<th>Test</th>
<th>Uncorrected $r$</th>
<th>Corrected $r$</th>
</tr>
</thead>
<tbody>
<tr>
<td>CTEP Grammar</td>
<td>.10</td>
<td>.16</td>
</tr>
<tr>
<td>CTEP Reading</td>
<td>.06</td>
<td>.09</td>
</tr>
<tr>
<td>CTEP Syntax</td>
<td>.08</td>
<td>.12</td>
</tr>
<tr>
<td>Math Assessment Test</td>
<td>.21</td>
<td>.29</td>
</tr>
<tr>
<td>11th Grade GPA - English</td>
<td>.37</td>
<td>.38</td>
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Remedial courses are better for students

Belfield & Crosta (2012): Given the frequency of underplacement, the poor predictive validity of assessment tests and the lack of positive outcomes for student placed into remediation, it would be statistically defensible and really quite reasonable to just put all students into transfer-level work.
We are only looking at GPA
Will only get a “C” in transfer course
Will only get a “C” in transfer course

Distribution of Statistics Node 8
Transfer-oriented students are better off in remediation than getting a “C” in transfer-level

Irvine Valley College, first course enrolled in, Spring 2000 to Fall 2011 who took an English course. N= 28,279, transfer within 4 years.
High school GPA is only good for recent graduates

Decay function for the predictive utility of HSGPA on English grades
High school GPA is only good for recent graduates

Decay function for the predictive utility of HSGPA on Math grades

Correlation between Predictor and 1st CC Math Grade

Semesters of Delay (approx. 6 months each)
Some lessons learned
(pilot colleges)

• MMAP rules performing as expected
• Implementation of MM rules is nuanced, requiring careful compliance with details
• Communication to students should specify which math classes they are recommended for
• Carful consideration if communication of placement includes MMAP and Test information.
• Projected impact of statewide MMAP rules based on scenario of little or no existing MM policies
• Outreach to local high schools
• Change takes time, or does it?
Goodies for the Breakout sessions

Looking at

• how rules were developed
• specific rules and trees
• impact on placement
• what is “disjunctive”? 
• how do I get started?
• Q & A
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