Multiple Measures Assessment Project: From Pilot to Paradigm

The Strengthening Student Success Conference
October 12, 2017

http://rpigroup.org/All-Projects/ctl/ArticleView/mid/1686/articleId/118/Multiple-Measures-Assessment-Project-MMAP
\[ y = f(x) \]
MMAP Project Overview

Collaboration
- CAI
- CCCC
- Cal-PASS
- RP Group
- 64+ CCCs

Model Development
- English
- Math
- ESL
- Reading
- Non-cognitive Variables
- Self-reported transcript data

Engagement
- Local replication
- Webinars
- Professional development
- Support
- Pilot results inform statewide implementation
Pilot College Implementation Overview

- 65 pilot colleges have signed a data sharing agreement
- 13+ additional colleges have received informal assistance
- ≈20 colleges implemented a pilot in fall 2015 or spring 2016 (or prior) mostly as small pilots to serve as a trial run
- Approximately 25 colleges reported they piloted in fall 2016 or planned to in spring 2017
- Approximately 17 are still in the planning phase
- Results from more than 12 colleges for English and 7 in math with more results being analyzed currently
The Models
Data Set for the Models

- CCC students enrolled in an English, Math, Reading or ESL class with matching high school data in Cal-PASS Plus
  - ≈1 M cases for Math & English; ≈200k for Reading & ESL
- Bulk of first CCC enrollments from 2008 through 2014
- Rules used students with 4 years of high school data (≈25% of sample)
- Used rpart, a machine learning algorithm, to create decision trees
- Local researchers trained to replicate models locally
- MMAP code
  

- R4IR Tutorial
  
  [https://drive.google.com/drive/folders/0Bz-jqwGzLQjJajA5YUIxUjdETzA?usp=sharing](https://drive.google.com/drive/folders/0Bz-jqwGzLQjJajA5YUIxUjdETzA?usp=sharing)
Variables Explored in the Models

- High School Unweighted Cumulative GPA
- Grades in high school courses
- CST scores
- Advanced Placement course taking
- Taking higher level courses (math)
- Delay between HS and CCC (math)
- HS English types (expository, remedial, ESL)
- HS Math level (Elem Algebra, Integrated Algebra, Pre-Calculus)
## Transfer-Level Placement Recommendations

<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 (STEM)</strong> (Passed Algebra II or better)</td>
<td>HS 11 GPA &gt;= 3.2 OR</td>
<td>HS 12 GPA &gt;= 3.2 OR</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 or Statistics (C or better)</td>
</tr>
<tr>
<td><strong>Statistics (General Education/ Liberal Arts)</strong> (Passed Algebra I or better)</td>
<td>HS 11 GPA &gt;= 3.0 OR</td>
<td>HS 12 GPA &gt;= 3.0 OR</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><strong>English</strong></td>
<td>HS 11 GPA &gt;= 2.6</td>
<td>HS 12 GPA &gt;= 2.6</td>
</tr>
</tbody>
</table>

Results from the Field
Pilot Summary

- MMAP rules performing as expected
- Messaging should be done once with a single voice and specifically state the recommended course
- Implementation of MMAP rules is nuanced
  - For example, don’t use statistics rules to place into calculus
- MMAP started new conversations within and across departments and services that did not occur prior
- Collaboration between high schools and colleges has increased and is an important element of success
Success Rates in Transfer-level English

- Sierra, 2014F: 73% Other, 79% MMAP
- Shasta, 2015S: 68% Other, 67% MMAP
- San Diego CCD, 2015F: 60% Other, 79% MMAP
- Norco, 2016F: 69% Other, 69% MMAP
- MiraCosta, 2016S: 65% Other, 67% MMAP
- MiraCosta, 2016F: 68% Other, 80% MMAP
- Merritt, 2015M-2016S: 50% Other, 56% MMAP
- Las Positas, 2016F: 75% Other, 77% MMAP
- Laney, 2015M-2016S: 76% Other, 71% MMAP
- Irvine Valley, 2016F: 77% Other, 85% MMAP
- College of Alameda, 2015M-2016S: 78% Other, 76% MMAP
- Canada, 2014F/2015F: 62% Other, 73% MMAP
- Berkeley, 2015M-2016S: 73% Other, 73% MMAP

Success Rates in Transfer-level Math

- San Diego CCD, 2015F: 60% Other, 50% MMAP
- Merritt, 2015M-2016S: 69% Other, 71% MMAP
- Norco, 2016F: 59% Other, 69% MMAP
- Laney, 2015M-2016S: 75% Other, 77% MMAP
- College of Alameda, 2015M-2016S: 75% Other, 76% MMAP
- Canada, 2014F/2015F: 46% Other, 70% MMAP
- Berkeley, 2015M-2016S: 51% Other, 46% MMAP

"Under our previous policies, African American and Latino students were far less likely to place into transfer-level math. Under the new policies, African American students’ access to transfer-level math increased eight-fold, Latino students’ access increased four-fold, and the disproportionate impact in placement was eliminated for all racial groups."
- Cuyamaca College

"There are thousands of reasons to do this; each one has a name."
- Bakersfield College

"MMAP is a COMPLETION initiative, not a SUCCESS initiative."
- Santa Monica College
Getting Help from Cal-PASS Plus
Maximizing High School Data -- Cal-PASS Plus

- Increasing participation in Cal-PASS Plus
- Web services -- API (New!)
- Transcript review
Increasing Local Participation in Cal-PASS Plus

- Check local district participation and completeness
  - Complete member list here: [https://www.calpassplus.org/calpass/join/members](https://www.calpassplus.org/calpass/join/members)

- Work with Cal-PASS PLUS to verify and update MOUs and data

- Identify primary outreach contact(s) from college to work with Cal-PASS PLUS
  - Name, college, role, contact info to Ken Sorey, [ken@edresults.org](mailto:ken@edresults.org)
<table>
<thead>
<tr>
<th>District Name</th>
<th>Most Recent Data</th>
<th>MOU</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alameda Unified</td>
<td>2015-2016</td>
<td>Yes</td>
</tr>
<tr>
<td>Albany City Unified</td>
<td>2015-2016</td>
<td>Yes</td>
</tr>
<tr>
<td>Antioch Unified</td>
<td>2015-2016</td>
<td>Yes</td>
</tr>
<tr>
<td>Aspire Public Schools</td>
<td>2012-2013</td>
<td>Yes</td>
</tr>
<tr>
<td>Berkeley Unified</td>
<td>2015-2016</td>
<td>Yes</td>
</tr>
<tr>
<td>Castro Valley Unified</td>
<td>2015-2016</td>
<td>Yes</td>
</tr>
<tr>
<td>Dublin Unified</td>
<td>2015-2016</td>
<td>Yes</td>
</tr>
<tr>
<td>Academic Year</td>
<td>Student</td>
<td>Course</td>
</tr>
<tr>
<td>---------------</td>
<td>---------</td>
<td>--------</td>
</tr>
<tr>
<td>2006-2007</td>
<td>22,133</td>
<td>18,945</td>
</tr>
<tr>
<td>2007-2008</td>
<td>21,277</td>
<td>36,981</td>
</tr>
<tr>
<td>2008-2009</td>
<td>20,862</td>
<td>52,045</td>
</tr>
<tr>
<td>2009-2010</td>
<td>21,263</td>
<td>63,731</td>
</tr>
<tr>
<td>2010-2011</td>
<td>22,325</td>
<td>138,986</td>
</tr>
<tr>
<td>2011-2012</td>
<td>19,831</td>
<td>84,611</td>
</tr>
<tr>
<td>2012-2013</td>
<td>20,960</td>
<td>135,343</td>
</tr>
<tr>
<td>2013-2014</td>
<td>20,956</td>
<td>134,897</td>
</tr>
<tr>
<td>2014-2015</td>
<td>20,874</td>
<td>49,353</td>
</tr>
<tr>
<td>2015-2016</td>
<td>20,058</td>
<td>184,593</td>
</tr>
</tbody>
</table>
Increasing Local Participation in Cal-PASS Plus

• Step 2: Strategies and tools for engaging local K-12 districts and stakeholders
  • Identify opportunities to engage partners in work
    • Superintendent and principal breakfasts/coffees (etc.)
    • Leadership phone calls/check ins
    • Outreach letters (sample included in FTP)
  • Use opportunities to share what this could mean for students from that district and for supporting local college readiness and completion efforts
    • Local Impact analysis
    • Other value-add data tools on the system
  • Cal-PASS Plus ready, willing, and able to support any and all of those outreach opportunities
Share Local Impact Analysis: MMAP

  - Overall
  - By College
  - By Math and English

- Limitations:
  - Does not include self-reported data
  - Based on students with Cal-PASS Plus data
  - Retrospective projections
  - Placement vs. Enrollment
Increasing Local Participation in Cal-PASS Plus

• Additional support material available to help K-12 districts get started
  – Benefits to participation
  – What data to upload
  – Citrus College outreach example:
    • http://bit.ly/MMAPCitrusOutreach
New Web Services from Cal-PASS Plus

• Current practice: frequent uploads of SFTP files with matching then return with data and placements
• API: real-time matching of data to CPP through data “calls” using a statewide ID for each student
• More secure and removes need to pass files
• What is returned
  – Transcript
    • Used for local Institutions to apply local models
  – Placement
    • Statewide Multiple Measures rules applied to student

Looking for Pilot Colleges to Implement
Local transcript review

- One backup strategy for students from K-12 districts with missing data or for out of state students
  - Can be resource intensive but tools can support use
  - College-developed resources
# Up to 11th grade transcript available
(formerly Direct Matriculant)

<table>
<thead>
<tr>
<th>GPA ≥ 3.6</th>
<th>GPA ≥ 3.4</th>
<th>GPA ≥ 3.3</th>
<th>GPA ≥ 3.2</th>
<th>GPA ≥ 3.0</th>
<th>GPA ≥ 2.9</th>
<th>GPA ≥ 2.8</th>
<th>GPA ≥ 2.6</th>
<th>GPA ≥ 2.4</th>
<th>GPA ≥ 2.3</th>
<th>GPA ≥ 2.0</th>
<th>GPA &lt; 2.0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calculus 1 (C or better)</td>
<td>Calc</td>
<td>Calc</td>
<td>Calc</td>
<td>Calc</td>
<td>Pre-Calc</td>
<td>Pre-Calc</td>
<td>Pre-Calc</td>
<td>Pre-Calc</td>
<td>Stats</td>
<td>Stats</td>
<td>Pre-Alg</td>
</tr>
<tr>
<td>Calculus 1 (enrolled)</td>
<td>Calc</td>
<td>Calc</td>
<td>Calc</td>
<td>Calc</td>
<td>Pre-Calc</td>
<td>Pre-Calc</td>
<td>Pre-Calc</td>
<td>Pre-Calc</td>
<td>Stats</td>
<td>Stats</td>
<td>Pre-Alg</td>
</tr>
<tr>
<td>Pre-Calculus (C+ or better)</td>
<td>Calc</td>
<td>Calc</td>
<td>Calc</td>
<td>Calc</td>
<td>Trig</td>
<td>Col Alg</td>
<td>Stats</td>
<td>Stats</td>
<td>Stats</td>
<td>Stats</td>
<td>Pre-Alg</td>
</tr>
<tr>
<td>Trigonometry (C or better)</td>
<td>Calc</td>
<td>Pre-Calc</td>
<td>Trig</td>
<td>Trig</td>
<td>Trig</td>
<td>Alg 2</td>
<td>Alg 2</td>
<td>Alg 1</td>
<td>Alg 1</td>
<td>Alg 1</td>
<td>Pre-Alg</td>
</tr>
<tr>
<td>Algebra 2 (B or better)</td>
<td>Pre-Calc</td>
<td>Pre-Calc</td>
<td>Col Alg</td>
<td>Col Alg</td>
<td>Stats</td>
<td>Alg 2</td>
<td>Alg 2</td>
<td>Alg 1</td>
<td>Alg 1</td>
<td>Alg 1</td>
<td>Pre-Alg</td>
</tr>
<tr>
<td>Algebra 1 (C or better)</td>
<td>GE Math</td>
<td>GE Math</td>
<td>GE Math</td>
<td>Stats</td>
<td>Stats</td>
<td>Alg 2</td>
<td>Alg 2</td>
<td>Alg 1</td>
<td>Alg 1</td>
<td>Alg 1</td>
<td>Pre-Alg</td>
</tr>
</tbody>
</table>

### Legend
- **Calc**: Calculus 1
- **Pre-Calc**: Pre-Calculus
- **Trig**: Trigonometry, College Algebra, GE Math, Statistics
- **Col Alg**: College Algebra, GE Math, Statistics
- **GE Math**: GE Math, Statistics
- **Stats**: Statistics
- **Alg 2**: Intermediate Algebra
- **Alg 1**: Elementary Algebra
- **Pre-Alg**: Pre-Algebra
- **Arith**: Arithmetic

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1. **Total non-weighted GPA**: Do not include weighted, academic, term-based, or yearly GPA.
2. **Highest math course taken in high school by increasing difficulty**.
3. **Grade received in course**.
4. **Student enrolled in Calculus 1 (no grade requirement)**.
Multiple Measures and ESL
ESL Findings

- Most HS ESL go into CC English
- Most Credit ESL students do not come from NC
- High School origin does not generally relate to college outcomes
- Multiple measures for ESL will benefit from extra questions on application
Other ESL Measures

- Questions on intake forms such as:
  – Years speaking English
  – Years of formal education
  – Self rating of writing, reading, speaking, listening
- TOEFL Scores
- Other tests or credentials
More Results from the Field
Implementing and Improving Our Multiple Measures Process:
How Cuyamaca College Transformed Basic Skills
September 26, 2017
Katie Cabral
Brianna Hays
Tammi Marshall
<table>
<thead>
<tr>
<th>Incoming Students</th>
<th>Fall 2015 Transfer Math</th>
<th>Fall 2016 B-STEM (w/ or w/out support)</th>
<th>Fall 2016 Statistics (w/ or w/out support)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asian</td>
<td>36%</td>
<td>79%</td>
<td>90%</td>
</tr>
<tr>
<td>Black</td>
<td>9%</td>
<td>49%</td>
<td>73%</td>
</tr>
<tr>
<td>Hispanic</td>
<td>21%</td>
<td>62%</td>
<td>85%</td>
</tr>
<tr>
<td>White</td>
<td>27%</td>
<td>62%</td>
<td>84%</td>
</tr>
<tr>
<td>All</td>
<td><strong>24%</strong></td>
<td><strong>62%</strong></td>
<td><strong>84%</strong></td>
</tr>
</tbody>
</table>
Success Rates Disaggregated by Ethnicity (First-Time Students)

<table>
<thead>
<tr>
<th>Incoming Students</th>
<th>Fall 2013 Cohort Transfer Math in Two Years</th>
<th>Fall 2016 Cohort Transfer Math with support</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asian</td>
<td>1-9</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>33%</td>
<td>75%</td>
</tr>
<tr>
<td>Black</td>
<td>16</td>
<td>29</td>
</tr>
<tr>
<td></td>
<td>6%</td>
<td>55%</td>
</tr>
<tr>
<td>Hispanic</td>
<td>173</td>
<td>144</td>
</tr>
<tr>
<td></td>
<td>15%</td>
<td>65%</td>
</tr>
<tr>
<td>White</td>
<td>141</td>
<td>142</td>
</tr>
<tr>
<td></td>
<td>16%</td>
<td>76%</td>
</tr>
<tr>
<td>All</td>
<td>360</td>
<td>356</td>
</tr>
<tr>
<td></td>
<td>15%</td>
<td>69%</td>
</tr>
</tbody>
</table>
Implementation of the Multiple Measures Assessment Project at Imperial Valley College

Office of Institutional Research
September 26, 2017
Imperial Valley College
Challenges in Implementation

• Low participation in CalPassPlus
• No electronic transcript system in place
• Little awareness of MMAP campus-wide
• Limited IR Staff
• “Our students are different” and dealing with skepticism
Fall 2016 MMAP Implementation - English

Transfer English - Success Rates

N= 704
58.80%

N= 109
71.60%

Non-MMAP

MMAP
Fall 2016 MMAP Implementation - Math

Transfer Success Rates

Non-MMAP: N=673, 62.70%
MMAP: N=44, 70.50%
Recommendations

• Promote MMAP awareness campus-wide
  – Involve IT, IR, SSSP, Faculty, Enrollment Management and Counseling
  – Share Data!

• Work with local high schools
  – Form articulation agreements, dual-enrollment, etc.
  – Report back to your feeder schools

• Training with IT and SSSP/Assessment on record keeping
• Training with Counselors on interpreting recommendations
VC: % Assessed into ENGL V01A by Ethnicity

Success Rate Increased from 73.3% to 74.4%

Fall 2012 | Fall 2015 | Fall 2016 | 80% of 2016 White Placement
---|---|---|---
ALL | 27 | 33 | 43
African American | 8 | 18 | 37
Asian | 21 | 30 | 45
Hispanic | 18 | 23 | 34
White | 46 | 53 | 65

+23%
Ventura College English

More students, higher success rate

- Success rates of 1st-Time fall 2016 students are compared to those of 1st-Time fall 2015 students.

<table>
<thead>
<tr>
<th>CTEP Score Group</th>
<th>Fall 2016</th>
<th></th>
<th></th>
<th>Fall 2015</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Enrollments</td>
<td>Successful</td>
<td>Success Rate</td>
<td>Enrollments</td>
<td>Successful</td>
<td>Success Rate</td>
</tr>
<tr>
<td>78 or Higher</td>
<td>311</td>
<td>250</td>
<td>80%</td>
<td>317</td>
<td>244</td>
<td>77%</td>
</tr>
<tr>
<td>74 to 77</td>
<td>112</td>
<td>87</td>
<td>78%</td>
<td>46</td>
<td>35</td>
<td>76%</td>
</tr>
<tr>
<td>73 or Less</td>
<td>142</td>
<td>115</td>
<td>81%</td>
<td>55</td>
<td>43</td>
<td>78%</td>
</tr>
<tr>
<td>No CTEP</td>
<td>54</td>
<td>44</td>
<td>81%</td>
<td>40</td>
<td>34</td>
<td>85%</td>
</tr>
<tr>
<td><strong>Total Av. Rate</strong></td>
<td><strong>619</strong></td>
<td><strong>496</strong></td>
<td><strong>80%</strong></td>
<td><strong>458</strong></td>
<td><strong>356</strong></td>
<td><strong>78%</strong></td>
</tr>
</tbody>
</table>
Multiple Measures at Mira Costa

*3.0 or above OR 2.5 GPA plus a B in English course, self-reported transcripts. N=1,329 for MMAP
Success by Placement Type at Mira Costa for Transfer-Level English

- Pre-Reform
- Post_Reform
- Compass
- MMAP
- EAP

- S2016
  - Pre-Reform: 65% (n=1,094)
  - Post_Reform: 69% (n=179)
  - Compass: 64% (n=179)
  - MMAP: 71% (n=179)
  - EAP: 67% (n=179)

- F2016
  - Pre-Reform: 68% (n=498)
  - Post_Reform: 75% (n=1,150)
  - Compass: 70% (n=1,150)
  - MMAP: 80% (n=1,150)
  - EAP: 72% (n=1,150)
Fall 2015: Cañada College

Cañada College Transfer-level Placements

<table>
<thead>
<tr>
<th></th>
<th>Compass</th>
<th>MMAP</th>
</tr>
</thead>
<tbody>
<tr>
<td>F2014 Math</td>
<td></td>
<td>191</td>
</tr>
<tr>
<td>F2015 Math</td>
<td>190</td>
<td>53</td>
</tr>
<tr>
<td>F2014 English</td>
<td></td>
<td>123</td>
</tr>
<tr>
<td>F2015 English</td>
<td>123</td>
<td>134</td>
</tr>
</tbody>
</table>

Rule set: English = 2.3 AND B- or better; Math = 3.2 AND C or better

Cañada College Transfer-level Success Rates

<table>
<thead>
<tr>
<th></th>
<th>Compass</th>
<th>MMAP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Math</td>
<td>65%</td>
<td>68%</td>
</tr>
<tr>
<td>English</td>
<td>78%</td>
<td>75%</td>
</tr>
</tbody>
</table>

bit.ly/MMAPPilotLessons
Self-Reported Transcript Data and Non Cognitive Variables
Self-reported high school transcript data

- 69 community colleges are now collecting self-reported data through the Open CCCApply application – this includes a mix of pilot and non-pilot colleges

- The team is currently trying to get access to these data to analyze the validity of self-reported data. – however preliminary data from the pilot colleges shows reliability between self-reported transcript data and actual transcripts
Preliminary Self-Report Data

- Overall strong correlation between self-reported high school GPA and actual GPA observed: \( r(12,048) = 0.707 \)

- Students with lower overall GPA somewhat less likely to report accurately

- Correspondence could be improved by
  - encouraging students to bring/consult transcripts at beginning of application and/or
  - making clear that inaccurate information could invalidate application
    - (though it would rarely be in college’s or student’s best interest for college to follow through on that threat).
14 pilot colleges have reported they are in the process of collecting Social-psychological (noncognitive variables) data
   the team is currently following up to try to get access to these data
   these include: Grit, Hope, Mindset, Conscientiousness, Teamwork Scale, Academic Self-Efficacy Scale, College Identity Scale

Preliminary results from a few colleges have not shown consistent relationships between the measured variables and course outcomes, but this could be due to many factors:
   timing of survey (during testing, application, etc.)
   length of survey
   frame of reference
MMAP Research Team

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