Enhanced Multiple Measures for Placement: The Multiple Measures Assessment Project (MMAP)

Strengthening Student Success Conference
October 8, 2015

http://www.rpgroup.org/projects/multiple-measures-assessment-project
Pin the success rate on the student

• In 2014, ACT conducted a study to demonstrate the validity and utility of the Compass test in predicting success in Math and English (Westrick and Allen, 2014)

• Based on their research, they generated success rates for students at different combinations of Compass score and GPA
Pin the success rate on the student

- Each of you have a set of success rates for transfer-level English based on their research
  - 23%, 28%, 32%, 43%, 49%, 55%, 65%, 70%, 75%
- Around the room you will find 9 categories of students with different combinations of scores on the COMPASS and HSGPA
  - Compass scores ranges from low of 30 to high of 90
  - HSGPA ranges from 2.0 to 4.0
- Your job is to correctly match success rates to students.
- Name and email on first slip – most accurate responses will receive their choice of:
  - Redesigning America's Community Colleges (Bailey et al, 2015)
  - Mindware: Tools for Smart Thinking (Nisbett, 2015)
Community college student transition

• Community colleges rely nearly entirely on standardized assessment (WestEd, 2011)

• Majority of students placed below college-level
  – Significant barrier to completion (Bailey, Jeong, & Cho, 2010)
  – 50-60% of equity gap in completions (Stoup, 2015)

• What does this mean?
  – First interaction is to tell students they don’t belong
  – Imply most students not ready for college and likely to fail
Growing body of evidence

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

• Incredible variability in cutscores; CCs often use HIGHER cutscores 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?

• Historically, tests alone have had relatively low predictive validity

• Multiple measures
  • provide a more complete picture of student ability
  • provide a way to increase the accuracy of placement, particularly reducing underplacement
    • http://bit.ly/CCRCPlacementAccuracy
  • are required by law
MMAP Project Overview

• Collaborative effort of CCCC0 Common Assessment Initiative (CAI) designed to develop, pilot, and assess implementation of placement tool using multiple measures through joint efforts of Cal-PASS Plus, RP Group and now 28 CCCs

• Develop multiple measures models for English and Mathematics and, in 2015-2016, Reading and ESL

• Identify, analyze and validate multiple measures data, including high school transcript data, non cognitive variable data, and self-reported HS transcript data

• Engage pilot colleges to conduct local replications, test models and pilot their use in placement, and provide feedback

Variables that predict CC success

**English**
- Cumulative HS GPA
- C+ or better in AP English class
- Score on English CST

**Math**
- Cumulative HS GPA
- Grades in Algebra II, Statistics, Trigonometry
- Enrollment in Calculus, Algebra I
- Taking a challenging CST
- Score on math CST
- Delay between HS and CCC
Level of and Success in First College Math for Students whose Last High School Course was Algebra 2 with Grade of B or Better (n=35,806)

Level of First Community College (CC) Course

- **Pre-Algebra/Elementary Algebra** (back one or more levels)
  - URM=69%
  - Male=37%
  - CST=275
  - Acc=57%

- **Intermediate Algebra** (repeating same level)
  - URM=58%
  - Male=42%
  - CST=301
  - Acc=84%

- **Transfer Level** (moved up 1+ levels)
  - URM=44%
  - Male=49%
  - CST=334
  - Acc=97%

College Success Rate  Percent Enrolled at CC Level
Transfer Level Placement

- **English**
  - Current: 38%
  - Disjunctive MM: 61%
  - Sample Size: (n=103,510)

- **Math**
  - Current: 31%
  - Disjunctive MM: 42%
  - Sample Size: (n=143,253)
Transfer Level Placement by Student Service

<table>
<thead>
<tr>
<th>Service</th>
<th>Current</th>
<th>Disjunctive MM</th>
</tr>
</thead>
<tbody>
<tr>
<td>English DSPS</td>
<td>23%</td>
<td>52%</td>
</tr>
<tr>
<td>English EOPS</td>
<td>26%</td>
<td>50%</td>
</tr>
<tr>
<td>English Fin Aid</td>
<td>18%</td>
<td>40%</td>
</tr>
<tr>
<td>Math DSPS</td>
<td>21%</td>
<td>30%</td>
</tr>
<tr>
<td>Math EOPS</td>
<td>27%</td>
<td>31%</td>
</tr>
<tr>
<td>Math Fin Aid</td>
<td>27%</td>
<td>39%</td>
</tr>
</tbody>
</table>
Transfer Level Placement by Gender

- **English**
  - Male: 39%
  - Female: 58%

- **English**
  - Male: 39%
  - Female: 64%

- **Math**
  - Male: 34%
  - Female: 42%

- **Math**
  - Male: 43%
  - Female: 28%
How long is High School GPA good for?

Decay function for the predictive utility of HSGPA on English grade

Semesters of delay (approx. 6 months each)

Correlation between HSPGA and 1st CC English grade

$y = -0.0076x + 0.342$
$R^2 = 0.62012$

$y = -0.0116x + 0.3631$
$R^2 = 0.83361$

HS 11 GPA
HS 12 GPA
Accuplacer
Linear (HS 11 GPA)
Linear (HS 12 GPA)

<table>
<thead>
<tr>
<th>Course</th>
<th>Compass Test</th>
<th>Compass</th>
<th>HSGPA</th>
<th>HSGPA + Compass</th>
</tr>
</thead>
<tbody>
<tr>
<td>English 1</td>
<td>Writing Skills</td>
<td>.31</td>
<td>.57</td>
<td>.62</td>
</tr>
<tr>
<td>Arithmetic</td>
<td>Pre-Algebra</td>
<td>.57</td>
<td>.34</td>
<td>.66</td>
</tr>
<tr>
<td>Algebra</td>
<td>Pre-Algebra</td>
<td>.36</td>
<td>.65</td>
<td>.80</td>
</tr>
<tr>
<td>Intermediate Algebra</td>
<td>Algebra</td>
<td>.47</td>
<td>.66</td>
<td>.84</td>
</tr>
<tr>
<td>College Algebra</td>
<td>Algebra</td>
<td>.41</td>
<td>.76</td>
<td>.88</td>
</tr>
<tr>
<td>College Algebra</td>
<td>College Algebra</td>
<td>.51</td>
<td>.76</td>
<td>.94</td>
</tr>
</tbody>
</table>
Multiple bodies of work showing higher student capacity

- Lowering cut scores

- 2-4X transfer-level course completion
- Comparable or higher success rates
- Works across demographic group
- Reduces equity gaps substantially
CAP: Completion of transfer-level math for traditional and accelerated pathways by ethnicity

Comparison

<table>
<thead>
<tr>
<th>Ethnicity</th>
<th>10%</th>
<th>20%</th>
<th>30%</th>
<th>40%</th>
<th>50%</th>
</tr>
</thead>
<tbody>
<tr>
<td>African American</td>
<td>10%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asian American</td>
<td>23%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hispanic</td>
<td>14%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>18%</td>
<td></td>
<td></td>
<td></td>
<td>44%</td>
</tr>
</tbody>
</table>

Acceleration
MMAP Phase 1 Pilot College

• June MMAP Pilot College Survey
  – 9 colleges still in initial planning/discussion
  – 12 replicating the statewide work
  – 8 completed implementation plans aiming for S16
  – 5 implementing right now in F15

• Early MM adopter (RP conf): bit.ly/RPMMEarly

SDCCD F2015 Pilot (N = ~1000)

- English: 24% Accuplacer, 58% Accuplacer + MM
- Math: 28% Accuplacer, 68% Accuplacer + MM
Sierra College F2014 Transfer-Level English Success Rates

- Fall 2011: 72%
- Fall 2012: 73%
- Fall 2013: 70%
- Fall 2014 ALL: 73%
- Fall 2014 - Accuplacer: 73%
- F14 HS Data: 79%
- F14 Other: 71%

Two-year rates of achievement F2012 Promise Pathways vs. Fall 2011 LBUSD comparison

<table>
<thead>
<tr>
<th>Category</th>
<th>F2012 Promise Pathways (N=933)</th>
<th>F2011 LBUSD (N=1654)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Successfully Completed Transfer Math</td>
<td>52%</td>
<td>23%</td>
</tr>
<tr>
<td>Successfully Completed Transfer English</td>
<td>52%</td>
<td>24%</td>
</tr>
<tr>
<td>Successful Completion of English 3</td>
<td>20%</td>
<td>3%</td>
</tr>
<tr>
<td>Behavioral Intent to Transfer</td>
<td>54%</td>
<td>31%</td>
</tr>
</tbody>
</table>
Equity impact: F2011 Baseline Equity Gaps for 2-year rates of achievement

- Transfer Math Successful Completion: 4% (African Americans), 12% (Hispanic), 18% (Asian), 21% (White)
- Transfer English Successful Completion: 13% (African Americans), 25% (Hispanic), 24% (Asian), 21% (White)
- English 3 Successful Completion: 2% (African Americans), 3% (Hispanic), 1% (Asian), 6% (White)
- Behavioral Intent to Transfer: 15% (African Americans), 32% (Hispanic), 33% (Asian), 41% (White)
Equity impact: F2012 2-year rates of achievement

- Transfer Math Successful Completion: 12% (F12 African American), 26% (F12 Hispanic), 21% (F12 Asian), 36% (F12 White)
- Transfer English Successful Completion: 39% (F12 African American), 51% (F12 Hispanic), 64% (F12 Asian), 66% (F12 White)
- English 3 Success: 18% (F12 African American), 17% (F12 Hispanic), 23% (F12 Asian), 28% (F12 White)
- Behavioral Intent to Transfer: 52% (F12 African American), 59% (F12 Hispanic), 42% (F12 Asian), 66% (F12 White)
Bakersfield College

Making It Happen

(MIH fulfilling our SEP, SSSP, ATD and BSI mandates)
Overview of Intervention

- Identify cohort traditionally known to require support (CalSOAP)
- Examine & institute Multiple Measures
- Examine Testing Practices
- Recruit and train mentor personnel (faculty, staff & administrators)
- Require frequent and proactive contact with mentees (relationship development)
- Evaluate data
ENGLISH PLACEMENT 2012-13

English (7323 placed)

- Academic Development ACDV 201 (9% placed)
- ACDV 65 2 units 37% placed
- English 60 4 units 7% placed
- English 50 4 units 18% placed

18% placed

Potential UNITS Cost to get all to English 1A
$1,677,552
3 semesters 10 units

29% placed

Potential UNITS Cost to get all to English 1A
$1,084,682
2 semesters 6 units

42% placed

English 1A Transfer, Degree and Certificate

Potential UNITS Cost to get all to English 1A
$208,851
1 semester 4 units

57% placed

New Placement based on HS GPA and HS English Grades

English 53 Accelerated 65% placed into this series 4 units in one semester

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High School Testing

- Some shocking information – Students test better at the high schools than in a foreign location – a lot better
- Challenge for BC, we have 41 feeder high schools
- Previous testing was not web-based, therefore changed to Accuplacer – a web-based (more easily delivered) test which promised BC automatically applied multiple measures and branched (smart) testing.
- Accuplacer also provided writing exam versus multiple choice for English
Placement Changes as a Result of Multiple Measures Implementation 2013 compared to 2014

<table>
<thead>
<tr>
<th>Percent Placed at transfer level and below for Math and Writing</th>
<th>2013 Writing (n=2171)</th>
<th>2014 Writing (n=2175)</th>
<th>2013 Math (n=2581)</th>
<th>2014 Math (n=2489)</th>
</tr>
</thead>
<tbody>
<tr>
<td>below 4 levels</td>
<td>11%</td>
<td>8%</td>
<td>35%</td>
<td>33%</td>
</tr>
<tr>
<td>below three levels</td>
<td>37%</td>
<td>35%</td>
<td>35%</td>
<td>35%</td>
</tr>
<tr>
<td>below two levels</td>
<td>6%</td>
<td>6%</td>
<td>21%</td>
<td>30%</td>
</tr>
<tr>
<td>below one level</td>
<td>17%</td>
<td>19%</td>
<td>6%</td>
<td>6%</td>
</tr>
<tr>
<td>level Transfer</td>
<td>29%</td>
<td>31%</td>
<td>7%</td>
<td>3%</td>
</tr>
</tbody>
</table>

N=2766 for Math and Writing, N=2960 for Math
2015 over 2111 semesters saved by multiple measures & testing
It is not just measuring them up and in importance of First Semester Course - taking pattern

- Previous data predicted better success if students took:
  a. Math first semester
  b. English first semester
  c. Had a full load of 12 or more units

- IT DID NOT PREDICT $a + b + c = $ better success

- Changed strategy - Math and Reading or English and Reading

- Communicate better with students about making choices but be directive ASEP
## Focusing on Successful Completion: MIH – Scaling up

<table>
<thead>
<tr>
<th>Enrolled</th>
<th>Previous 3 cohorts (n=484)</th>
<th>2014 MIH cohort (n=467)</th>
<th>2015 MIH cohort (1635)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percent with multiple measures</td>
<td>0%</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>Percent enrolled</td>
<td>55.7% (270)</td>
<td>70% (326)</td>
<td>88% (1433)</td>
</tr>
<tr>
<td>Enrolled in English first semester</td>
<td>38% (100)</td>
<td>76% (248)</td>
<td>87% (1243)</td>
</tr>
<tr>
<td>Enrolled in Math first semester</td>
<td>41% (108)</td>
<td>75% (246)</td>
<td>82% (1175)</td>
</tr>
</tbody>
</table>
What we have learned from the data

<table>
<thead>
<tr>
<th>MIH Group</th>
<th>Math (college-wide)</th>
<th>English (college-wide)</th>
<th>Reading (college-wide)</th>
<th>Total students enrolled from each cohort</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011</td>
<td>64% (50.5%)</td>
<td>57% (58.7%)</td>
<td>62% (67.8%)</td>
<td>73</td>
</tr>
<tr>
<td>2012</td>
<td>59% (52.7%)</td>
<td>64% (61.7%)</td>
<td>75% (67.1%)</td>
<td>92</td>
</tr>
<tr>
<td>2013</td>
<td>64% (53.9%)</td>
<td>61% (62.2%)</td>
<td>59% (67.3%)</td>
<td>99</td>
</tr>
<tr>
<td>2014</td>
<td>49% (52.2%)</td>
<td>60% (63.1%)</td>
<td>62% (65.9%)</td>
<td>326</td>
</tr>
<tr>
<td>2015</td>
<td>71%</td>
<td>59.5%</td>
<td>80%</td>
<td>1635</td>
</tr>
<tr>
<td>Summer only</td>
<td>N=83</td>
<td>N=37</td>
<td>(N=24)</td>
<td></td>
</tr>
</tbody>
</table>
BC Philosophy behind MMs and Assessment

- Tests aren’t always the best measures
- Tests alone are TERRIBLE measures
- The goal is to predict success
- More information provides better placement
- We need to simplify the algorithm – junior year grades
- Not perfect, iterative – don’t wait
- Thousands of reasons to START NOW
Multiple Measures Success Fall 2014 English MIH Cohort

<table>
<thead>
<tr>
<th>Course</th>
<th>Not Bumped</th>
<th>Bumped</th>
<th>BC overall</th>
<th>MIH Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACDV B65</td>
<td>82%</td>
<td>75%</td>
<td>74%</td>
<td>81%</td>
</tr>
<tr>
<td>ENGL B60</td>
<td>58%</td>
<td>68%</td>
<td>50%</td>
<td>65%</td>
</tr>
<tr>
<td>ENGL B53</td>
<td>50%</td>
<td>57%</td>
<td>50%</td>
<td>54%</td>
</tr>
<tr>
<td>ENGL B50</td>
<td>47%</td>
<td>50%</td>
<td>60%</td>
<td>48%</td>
</tr>
<tr>
<td>ENGL B1A</td>
<td>67%</td>
<td>58%</td>
<td>63%</td>
<td>64%</td>
</tr>
</tbody>
</table>
Multiple Measures Success Fall 2014 in Remedial Math MIH Cohort

<table>
<thead>
<tr>
<th></th>
<th>ACDV B77</th>
<th>ACDV B72</th>
<th>Math B50</th>
<th>Math B60</th>
<th>Math B70</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not bumped</td>
<td>41%</td>
<td>41%</td>
<td>73%</td>
<td>61%</td>
<td>31%</td>
</tr>
<tr>
<td>Bumped</td>
<td>100%</td>
<td>67%</td>
<td>100%</td>
<td>59%</td>
<td>40%</td>
</tr>
<tr>
<td>BC overall</td>
<td>60%</td>
<td>36%</td>
<td>58%</td>
<td>48%</td>
<td>48%</td>
</tr>
<tr>
<td>MIH overall</td>
<td>44%</td>
<td>44%</td>
<td>80%</td>
<td>61%</td>
<td>35%</td>
</tr>
</tbody>
</table>
Gateway English and Math

Success in English Gateway Course

<table>
<thead>
<tr>
<th></th>
<th>2009-10 to 2012-13</th>
<th>2011-12 to 2013-14</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALL</td>
<td>69%</td>
<td>76%</td>
</tr>
<tr>
<td>AFRICAN AMERICAN</td>
<td>77%</td>
<td>73%</td>
</tr>
<tr>
<td>HISPANIC</td>
<td>64%</td>
<td>69%</td>
</tr>
</tbody>
</table>

Gap is being mitigated as success increases

Success in Math Gateway Course

<table>
<thead>
<tr>
<th></th>
<th>2009-10 to 2012-13</th>
<th>2011-12 to 2013-14</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALL</td>
<td>59%</td>
<td>57%</td>
</tr>
<tr>
<td>AFRICAN AMERICAN</td>
<td>68%</td>
<td>67%</td>
</tr>
<tr>
<td>HISPANIC</td>
<td>43%</td>
<td>57%</td>
</tr>
</tbody>
</table>

African American gap is being closed

Hispanic gap is being closed
• Partnerships—Public-Private
  
  Dr. Fulks (MIH – BC), Dr. Sherley KHSD Director of Ed Services, Vickie Spanos KHSD Director of Instruction, Dr. Mimms CSUB AVP of Enrollment Management, Kristy Fraley KHSD Resource Counselor, Lesley Bonds BC MIH Program Director
Pin the success rate on the student - II

• Same success rates, same students
  – Try again

• Same prize for most improved accuracy

<table>
<thead>
<tr>
<th>High School GPA</th>
<th>Compass Score (30 extremely low to 90 extremely high)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>30</td>
</tr>
<tr>
<td>2.00</td>
<td>23%</td>
</tr>
<tr>
<td>3.00</td>
<td>43%</td>
</tr>
<tr>
<td>4.00</td>
<td>65%</td>
</tr>
</tbody>
</table>
Contacts

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