Research and Evaluation Considerations

Multiple Measures Assessment Project

March 29, 2017

http://rpgroup.org/All-Projects/ctl/ArticleView/mid/1686/articleId/118/Multiple-Measures-Assessment-Project-MMAP
Overview

- Baseline report
- Planning comparisons
- Outcome metrics/reporting intervals
  - Initial placement changes
  - Course success rates
  - Sequence completion
  - Long-term outcomes
- Disaggregation of outcomes
- Student and faculty surveys
- Performance of overall assessment system
- Other useful analyses/evaluation to plan

- Don’t forget to submit your placement, self-report, and NCV data for inclusion in the statewide analysis!
Baseline reporting & key categories

• Develop a baseline report prior to implementation
  – proportion of students who place into each level
  – proportion of students who enroll into each level
  – success rates, by level
  – sequence completion, by cohort and by initial placement

• Develop method/plan for identifying students placed via:
  – Overlap group  
    (MM and Test)
  – Multiple measures  
    (MM only or MM only with overlap group)
  – Test placement  
    (Test only or Test only with overlap group)
  – Entire Group
  – Total of 6 possible combinations
The six groups

- All students
- All Test
- Test only
- MMAP only
- All MMAP
- Both test & MMAP
Planning Comparisons

• Students from prior terms
  – Identify students who would have been eligible for MMAP using local criteria (e.g., first-time students, high school, etc.)
  – Make sure to use comparable terms (e.g., fall vs. fall)
  – Retrospective datafile available:
    • useful to help identify students who would have been eligible
    • good for propensity score matching, logistic regression, etc.

• Ineligible or students w/o available data in same term

• Additional comparisons for specific outcomes:
  – Placements: what placements MMAP-eligible students would have received
  – Throughput rates: students who have progressed through sequence (no. of gateway completers / no. of those initially enrolled)
Early Outcome Metrics

• Proportion of incoming students placed at transfer-level compared to:
  – how they would have been placed otherwise (if available)
  – comparable students in previous terms

• Course enrollment rate and success rates
  – Part 1 - MMAP-placed student performance
    • Students placed by MMAP (do not separate until Part 2) vs. typical success rates in course
  – Part 2 - By method of placement into transfer level
    • Overlap group (MM and Test)
    • Multiple measures (MM only or MM only with overlap group)
    • Test placement (Test only or Test only with overlap group)
    • Entire Group

• Successful completion of transfer-level course in first year
Math Transfer Level Caveat

• Double-check that students taking transfer-level math courses were actually eligible for that specific course per MMAP decision rules

• Implications if condition above not met:
  – Pass rates will not be at the expected level
  – Suggested Comparison: Throughput Rates
    • Throughput rates may still be higher
Survey Students and Faculty

• Consequential validity survey
  • Sample consequential validity questions (see p. 9)

Which of the following is most true of your placement?
  1. I should be in a course higher (more advanced) than this one.
  2. I am in the right class.
  3. I should be in a class lower (less advanced) than this one.

• Potential multiple administrations of survey
  (e.g.: before course, beginning, and end of course)
  – advantage: data on students who drop, evidence of change through semester
Potential Important Survey Limitations

• Self-reported satisfaction with assessment by instructors and students may have significant methodological flaws:
  • Selection bias
  • Confirmation bias
  • Effort justification
  • System justification
  • Self-fulfilling prophecy effects and stereotype threat
  • Relative invisibility of underplacement
  • Abstract/overall assessments also problematic
    –Grounded in pre-existing beliefs rather than experiences
Survey Students and Faculty

- ESL survey for additional multiple measures evidence
- Focus Groups
- Interviews
- Other implementation/satisfaction surveys of students, faculty, and staff (some samples at www.lbcc.edu/PromisePathways)
Assessing Disproportionate Impacts

- Disaggregate placement, success and throughput by equity categories
  - Ethnicity, gender, DSPS status, Foster Youth, EOPS, CalWorks, SES, Veterans, etc.
  - 80% Rule
  - Percentage gap method
  - Proportionality index
- Compared to other assessment methods does multiple measures reduce DI?
Long-term Outcome Metrics

• Enrollment & success rates in next course in sequence
• Transferable units attempted/completed in first semester/year
• Persistence to second semester/year
• Behavioral intent to transfer
• Completion of unit milestones (30, 60)
• Degree, certificate, transfer
Placement Error

- **Overplacement**: Student is placed above their ability to succeed. Highly visible.
- **Underplacement**: Student could have been successful at a higher level than where placed. Tends to be invisible.

- Current placement systems tend to result in much greater underplacement error.
- Total placement error is minimized when over- and underplacement are balanced.
Establish common set of metrics that tell us about placement system performance

- **Accuracy**: proportion of students correctly predicted to be successful or to be unsuccessful.
- **PPV**: Positive predictive value, the number of passing students (i.e., true positives) divided by the number of students predicted to succeed
- **NPV**: Negative predictive value, the number of passing students (i.e., true positives) divided by the number of students predicted to succeed
- **Sensitivity**: Correctly identify true positives \([\frac{TP}{TP+FP}]\)
- **Specificity**: Correctly identify true negatives \([\frac{TN}{TN+FN}]\)
Information that can be used to evaluate placement systems

<table>
<thead>
<tr>
<th></th>
<th>Predicted to Fail</th>
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<tbody>
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NPV
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Sensitivity
Additional Resources

- Sample research plan: http://bit.ly/2mUNxkL
- Long Beach City College Example Plan: http://bit.ly/2mSzGat
- California Acceleration Project Data Template: http://bit.ly/2nEQwhF
  - Using DI Methods to Identify Equity Gaps: https://prolearningnetwork.cccco.edu/ask-resource/disproportionate-impact/
Return Your Data to the MMAP Team

• The research team is collecting pilot college data in order to analyze the results and determine how well the models are working.
  – Assessment data for students placed by MMAP and all other methods for comparison
  – Self-reported transcript data
  – Non cognitive variable data

– Resources on returning your data on the “returning your pilot college data” tab: http://bit.ly/2my3J73
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Validating student effort/performance may attract students to our courses and colleges.

## Transfer Level Fall Outcomes: English Success Rates – Part 1

<table>
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<tr>
<th>Group</th>
<th>Cohort</th>
<th>Count</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accuplacer Only (Includes Local MM)</td>
<td>1041</td>
<td>707</td>
<td>68%</td>
</tr>
<tr>
<td>MMAP</td>
<td>197</td>
<td>155</td>
<td>79%</td>
</tr>
<tr>
<td>Other (EAP, SAT, ACT, etc.)</td>
<td>757</td>
<td>523</td>
<td>69%</td>
</tr>
<tr>
<td>Sequence (completed one-level below)</td>
<td>1,802</td>
<td>1,259</td>
<td>70%</td>
</tr>
<tr>
<td>Total</td>
<td>3,797</td>
<td>2,644</td>
<td>70%</td>
</tr>
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</table>
## Transfer Level Fall Outcomes: English Success Rates – Part 2

<table>
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<tr>
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<th>Cohort</th>
<th>Count</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accuplacer Only (Includes Local MM)</td>
<td>1,012</td>
<td>689</td>
<td>68%</td>
</tr>
<tr>
<td>Accuplacer (MMAP lower)</td>
<td>29</td>
<td>18</td>
<td>62%</td>
</tr>
<tr>
<td>Placed by both MMAP and Accuplacer</td>
<td>81</td>
<td>66</td>
<td>81%</td>
</tr>
<tr>
<td>MMAP Only (Accuplacer lower)</td>
<td>116</td>
<td>89</td>
<td>77%</td>
</tr>
<tr>
<td>Other (EAP, SAT, ACT, etc.)</td>
<td>757</td>
<td>523</td>
<td>69%</td>
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Spring 2016 English Pilot

Placement into Transfer-Level English

<table>
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<tr>
<th>Group</th>
<th>Previous Cohort</th>
<th>MMAP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall</td>
<td>57%</td>
<td>71%</td>
</tr>
<tr>
<td>African American</td>
<td>44%</td>
<td>58%</td>
</tr>
<tr>
<td>Hispanic</td>
<td>42%</td>
<td>62%</td>
</tr>
<tr>
<td>Asian</td>
<td>66%</td>
<td>76%</td>
</tr>
<tr>
<td>PI</td>
<td>47%</td>
<td>63%</td>
</tr>
<tr>
<td>White</td>
<td>69%</td>
<td>83%</td>
</tr>
</tbody>
</table>
Transfer-Level English Success rate by year/placement type

- S2013: 63%
- S2014: 64%
- S2015: 66%
- S2016 - Old: 66%
- S2016 - MMAP: 69%
Additional resources on DI

• Using DI Methods to Identify Equity Gaps
  – [https://prolearningnetwork.cccco.edu/ask-resource/disproportionate-impact/](https://prolearningnetwork.cccco.edu/ask-resource/disproportionate-impact/)

• Assessing and Mitigating Disproportionate Impact in Matriculation Services

• Assessment Validation Project
  – [http://rpgroup.org/content/assessment-validation-project](http://rpgroup.org/content/assessment-validation-project)

• Matriculation Evaluation: Student Resources
  – [http://rpgroup.org/content/matriculation-evaluation-evaluation-student-resources](http://rpgroup.org/content/matriculation-evaluation-evaluation-student-resources)
Additional Potential Supportive Analyses

• Regression discontinuity designs
  – Or simple version - compare students on either side (+/- ~5-6 points) of cutscore
  – Sequence completion, persistence, graduation/transfer, units completed at 3 and 4 years

• Transfer-rate comparisons based on grade in first course in sequence
Students who get a C in transfer-level course are more likely to transfer.

Hayward & Fagioli (in preparation) Irvine Valley College Multiple Measures Research: First course enrolled in, Spring 2000 to Fall 2011 - transfer within 4 years of course