BRINGING INTENTIONAL INSTRUCTION INTO THE ADAPTIVE LEARNING ENVIRONMENT

OLC INNOVATE CONFERENCE

APRIL 19, 2018
Overview

- Data, data everywhere
- What’s the problem?
- Faculty buy in
- What data is available?
- Caution: Data Ahead
- What can we learn from data?
- Data and interventions: What’s the connection
- Curriculum vs. instructional interventions
- Let’s examine some data!
Data Overload

History of data collection
Can’t see the forest for the trees
How do we determine the importance of the data?
Can this be applied to adaptive learning?
Issues faced by Adaptive Learning Faculty

• Improving pass rates
• Providing the proper resources
• Engaging with students
• Motivating students
• Increasing the engagement in the later assignments
• Working with snails vs. hares, how to work with different groups of students
Faculty Buy-In

• What can an institution do to help faculty embrace the adaptive learning environment?

   ❖ Training

   - Builds Confidence
   - Provides Tools for Success
   - Demonstrates how to use data from their own classes
   - Creates a collaborative environment
Faculty Buy-In

• What can an institution do to help faculty embrace the adaptive learning environment?
  
  ❖ Provide data showing the increase in retention and passing rate in adaptive learning versus non-adaptive learning
  ❖ Provide support to faculty to help create the best learning environment
Some of the data available to faculty for their class in adaptive learning environment:

- Pass rate per class
- Completion rate per class
- Average grade per class
- Average grade per lesson or unit
- Average time spent by lesson
- Percent of times a particular question is answered correctly
Data available to Institution

• Grade distribution by faculty
• Pass and completion rate trends
• Data for faculty across different classes
• Information regarding each lesson
• Statistics about each type of question
• Statistics about each question
Caution: Data Ahead

- Keep in mind that you should not take data at face value, it must be combined with other information to get the big picture.
- One session of data is not enough to make an analysis, rather look at trends.
- What is the frame of reference? Is the data being compared to a goal, session over session or some other metric?
- Examine the sample size
- What is the standard deviation?
What can we learn from data?

• Completion and Passing Rate Trends:
  - Administrators can look for any decreasing or increasing trends and investigate the cause
  - Care must be taken to see if there are any confounding variables that may have caused the trend
  - A complete analysis of the data is needed to determine the cause of any trend
What can we learn from data?

• Average Time Per Lesson:
  ❖ This is data that instructors can check as well as the institution and they can be a primary source for the information.
  ❖ If a lesson consistently has a longer average time than other lessons, an analysis of the lesson is warranted.
    ❖ Do additional resources need to be provided to students?
    ❖ Are there particular questions that are contributing to the length of time?
    ❖ Is this the mean or the median?
  ❖ If a lesson has a lower average than similar lessons, it also needs to be analyzed.
    ❖ Are individual questions the major contributor to the low average?
What can we learn from data?

• Re-taker Rate
  ❖ Does re-taker rate increase or decrease historically occur during the same session each year?
  ❖ An analysis should be performed to determine which faculty perform the best with this population.
  ❖ Should the re-takers be grouped together in sections or spread out uniformly throughout all sections?
What can we learn from data?

• Grade distribution by faculty trends
  ❖ Are faculty paired with the course(s) where they are most successful?
  ❖ Are certain faculty’s classes consistently among the top pass rate and average grades?
    ❖ What can we learn from these faculty and how can we use that information to help other faculty?
  ❖ Are certain faculty’s classes consistently below the average in pass rate and/or average grade?
    ❖ What resources and support can we provide to these instructors?
Determining the best faculty/course match

- Use a matrix to determine the best course and faculty match
  - Choose the most important criteria
    - Passing rate
    - Average course grade
    - Course observations
    - Retention rate
  - Determine which faculty perform best in a particular course
  - Determine which course that a particular faculty performs best
## Initiatives to Use

<table>
<thead>
<tr>
<th>Instructional</th>
<th>Curricular</th>
</tr>
</thead>
<tbody>
<tr>
<td>Additional training for faculty</td>
<td>Replace/reword specific question</td>
</tr>
<tr>
<td>Mentoring instructors</td>
<td>Inform faculty which topics need additional explanations</td>
</tr>
<tr>
<td>Provide extra resources to use in the classroom</td>
<td>Rearrange faculty courses</td>
</tr>
<tr>
<td>Collaboration</td>
<td>Regroup re-takers</td>
</tr>
<tr>
<td>Additional Outreach</td>
<td>Look at scope and sequence of pre-requisite classes</td>
</tr>
</tbody>
</table>
### FACULTY MATRIX

<table>
<thead>
<tr>
<th>Math xyz</th>
<th>Term</th>
<th>Completion rate</th>
<th>Pass Rate</th>
<th>Retention Rate</th>
<th>Classroom Observation</th>
<th>Preference</th>
<th>Sum of rates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jane Doe</td>
<td>Q1 - 2016</td>
<td>0.8</td>
<td>0.909</td>
<td>0.87</td>
<td>0.87</td>
<td>0.88</td>
<td>3.398272058</td>
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<tr>
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<td>Q2 - 2016</td>
<td>0.83333</td>
<td>0.9375</td>
<td>0.92</td>
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<tr>
<td></td>
<td>Q3 - 2016</td>
<td>0.536585366</td>
<td>0.733333333</td>
<td>0.731707317</td>
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<tr>
<td></td>
<td>Q4 - 2016</td>
<td>0.769230769</td>
<td>0.888888889</td>
<td>0.865384615</td>
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<td>0.85</td>
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<tr>
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<td>Q1 - 2017</td>
<td>0.9</td>
<td>0.9375</td>
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<td>0.88</td>
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</tr>
<tr>
<td></td>
<td>Q2 - 2017</td>
<td></td>
<td>0.881244444</td>
<td>0.865198386</td>
<td>0.884</td>
<td>0.884</td>
<td>3.478115956</td>
</tr>
<tr>
<td>John Doe</td>
<td>Q1 - 2016</td>
<td>0.728813559</td>
<td>0.811320755</td>
<td>0.898305085</td>
<td>0.79</td>
<td>0.79</td>
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<tr>
<td></td>
<td>Q2 - 2016</td>
<td>0.854166667</td>
<td>0.911111111</td>
<td>0.9375</td>
<td>0.87</td>
<td>0.87</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Q3 - 2016</td>
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<td>0.926829268</td>
<td>0.854166667</td>
<td>0.82</td>
<td>0.82</td>
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<tr>
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<td>Q4 - 2016</td>
<td>0.8113</td>
<td>0.8958</td>
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<td>Q1 - 2017</td>
<td>0.8983</td>
<td>0.9464</td>
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<tr>
<td></td>
<td>Q2 - 2017</td>
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<td>0.816849379</td>
<td>0.90897435</td>
<td>0.854</td>
<td>0.854</td>
<td>3.478115956</td>
</tr>
</tbody>
</table>

Data did not come from an actual course.
# Sample data 1 – Math XYZ

<table>
<thead>
<tr>
<th>Session</th>
<th>Population</th>
<th>Pass Rate</th>
<th>Completion Rate</th>
<th>Pass rate times completion rate</th>
<th>Average grade for nonpassing students</th>
<th>Average grade for passing students</th>
<th>Retaker rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spring 2017</td>
<td>109</td>
<td>70.1%</td>
<td>90.1%</td>
<td>63.2%</td>
<td>32.4%</td>
<td>79.2%</td>
<td>15.1%</td>
</tr>
<tr>
<td>Summer 2017</td>
<td>65</td>
<td>61.3%</td>
<td>78.6%</td>
<td>48.2%</td>
<td>25.1%</td>
<td>67.1%</td>
<td>27.1%</td>
</tr>
<tr>
<td>Fall 2017</td>
<td>134</td>
<td>73.3%</td>
<td>88.9%</td>
<td>65.2%</td>
<td>39.4%</td>
<td>78.4%</td>
<td>9.1%</td>
</tr>
<tr>
<td>Winter 2017</td>
<td>110</td>
<td>64.4%</td>
<td>86.4%</td>
<td>55.6%</td>
<td>44.1%</td>
<td>81.2%</td>
<td>17.3%</td>
</tr>
</tbody>
</table>

What can we learn from this set of data?

Data did not come from an actual course
Sample data 1

• The summer rates are lower, but the population is smaller and the retaker rate is higher. Can not be sure those rates are statistically significant.

• The average grade for nonpassing students in the summer session is lower than the other sessions. Could be due to higher rate of students who quit participating during the class.
<table>
<thead>
<tr>
<th>Unit</th>
<th>Average time per unit (HRS)</th>
<th>Average grade per unit</th>
<th>Percent of students that did not complete this unit</th>
<th>Number of lessons per unit</th>
<th>Total number of questions per unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>5.06</td>
<td>90.78%</td>
<td>8.9%</td>
<td>9</td>
<td>89</td>
</tr>
<tr>
<td>2</td>
<td>6.08</td>
<td>89.34%</td>
<td>9.7%</td>
<td>10</td>
<td>94</td>
</tr>
<tr>
<td>3</td>
<td>11.25</td>
<td>78.45%</td>
<td>14.1%</td>
<td>11</td>
<td>123</td>
</tr>
<tr>
<td>4</td>
<td>7.85</td>
<td>87.45%</td>
<td>12.1%</td>
<td>9</td>
<td>82</td>
</tr>
<tr>
<td>5</td>
<td>5.98</td>
<td>80.34%</td>
<td>13.9%</td>
<td>8</td>
<td>78</td>
</tr>
</tbody>
</table>

Data did not come from an actual course
Sample Data 2

• Big change in unit 3
  – Is the drop in performance due to the larger number of questions in the unit?
    • The average amount of time per question ranges from 3.4 minutes in unit 1 to over 4.5 minutes in units 3 and 4.
  – The percent of students completing each unit is significantly lower in Unit 3.
  – The growing incompletion rate in units 4 and 5 indicate that additional outreach may be needed.
Your turn!

- Use the data in the handout to determine what interventions you think are needed in each of these classes.
- Divide into groups and discuss your decisions.
- We will convene afterwards and hear what ideas each group has.
Questions?
Contact Information

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