LEVERAGING PREDICTIVE ANALYTICS TO SUPPORT STUDENT SUCCESS

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University of Maryland, Baltimore County

(Much of the work today has been done with our colleague John Fritz, Associate Vice President for Instructional Technology)
Evaluate Sessions and Win!

- Download and open OLC Conferences mobile app
- Navigate to specific session to evaluate
- Select “Evaluate Session” on session details screen (located under session type and track)
- Complete session evaluation*

*Each session evaluation completed (limited to one per session) = one contest entry

**Five (5) $25 gift cards** will be awarded to five (5) individuals
Must submit evals using the OLC Conferences mobile app or website
http://tiny.cc/GoRetrievers

Or text THOMASPENNIS515 to 22333 once to join
That words come to mind when you think about "predictive analytics"?
About UMBC

- Founded: 1966
- Located 10 minutes from Baltimore, Maryland and 30 minutes from Washington, DC
- Student Enrollment, Fall 2018
  - Undergraduate: 11,260
  - Graduate: 2,507
  - Total: 13,767
  - Roughly 50% of students are transfers
  - Slightly less than 50% enter as STEM majors
- Carnegie Classification – Doctoral Universities (Higher Research Activity, approximately $100 million per year in funded research)
Time for Everyone's Favorite Game

*Who's Paying Attention!*

Get ready to compete!
What of the following is *not* true of UMBC?
What of the following is not true of UMBC?

- It's a midsized Mid-Atlantic University
- It's men's basketball team was the first 16 over 1 seed win in the NCAA men's basketball tournament
- Its mascot is a Raven
- It is roughly half transfer students

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What of the following is not true of UMBC?

- It's a midsized Mid-Atlantic University
- It's men's basketball team was the first 16 over 1 seed win in the NCAA men's basketball tournament
- Its mascot is a Raven
- It is roughly half transfer students

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Today’s presentation

• The strategic environment facing higher education
• Using analytical and communications tools as an ecosystem to support student success
  – Some early results and pilots
  – How we’re combining different tools and information to achieve results
• A general strategy for building on early pilots
• And, as always, it’s not the tools; it’s what you do with them that matters
The Strategic Environment Facing Public Higher Education
Our federal funding is going to dry up

Age-based spending (driven by demographic trends and low fertility rates common to many countries) will put pressure on federal budgets.
Our state funding is going to dry up

• These same forces will put pressure on state budgets

THE WALL STREET JOURNAL.

The Pension Hole for U.S. Cities and States Is the Size of Germany’s Economy

Many retirement funds could face insolvency unless governments increase taxes, divert funds or persuade workers to relinquish money they are owed
It’s already happening

- Funding for public higher education is flat or has declined in 47 of 50 states and is unlikely to recover to its former path.
- Percent change in state spending per student, inflation adjusted 2008-17 (source: Center on Budget and Policy Priorities)
We can’t continue to raise prices

- Because our costs are relatively fixed when funding goes down, prices go up and access and affordability go down.
- The average growth rate of tuition and fees is twice that of median family income in the US over the past ten years.

![Chart showing annual percentage change in tuition and fees versus funding per FTE student from 1985-86 to 2015-16.](image.png)
The value of a degree has never been higher

- But only if students finish!
- Those with some college earn 13 percent more than those with none.
- Those who finish earn 68 percent more (over their lifetime).
- A degree is worth a million dollars
Our base of traditional “customers” will shrink

- Similar age-based demographic trends exist in much of the US, it will just take longer in some regions than in others
The bottom line: change or be changed

• Prices are rising more rapidly than family incomes, threatening access to degrees that are ever more valuable
  • With higher prices comes more accountability
• We face pressures from the marketplace. The pool of students is shrinking
• We graduate too few students (US average = 60%) leaving many with large debt and without access to higher paying jobs
• Improving our performance is both a business and a moral imperative
Find the *True* Statement
Find the True Statement

Poll locked. Responses not accepted.

Federal and state funding is here to stay

The percentage of "traditional" students is decreasing

Raising tuition is always an option

Change isn't necessary
Find the True Statement

Poll locked. Responses not accepted.

Federal and state funding is here to stay

The percentage of "traditional" students is decreasing

Raising tuition is always an option

Change isn't necessary

✓ 0%
Big bets on analytics

• We have established an advanced data and analytics group split between IT and Academic Affairs divisions (in addition to a separate IR office)

• The component parts:
  • A Data Science Team (comprised mostly of students!)
  • A Business Intelligence and Student Success Technologies Group
  • And colleagues that constitute ”a coalition of the willing”

• We conduct analysis for prediction and assessment, design academic innovations, support planning, and construct advanced visualizations for improved decision support

• Our overarching goals are to lower the cost of using information by
  • Making information easier to find
  • Making data easier to understand
  • Make information easier to act on
  • Designing and deploying academic innovations
Using Our Analytics and Student Support Ecosystem
Step 1: Choosing a lever to pull – UMBC’s first year alert program

• The First Year Intervention Program (FYI) notifies students in their first year at UMBC that they are in danger of receiving a D or F in a course
• The alert has a very sterile tone, and provides students with links to resources to improve their grade in that course
• Faculty are encouraged to submit alerts via an web form at approximately the 6th week of a fifteen week semester
Many things must happen for FYI’s to be an effective treatment

• Faculty participation is critical
• Students must be identified as being “at risk” with an appropriate degree of accuracy
• Students must receive the information with enough time to seek assistance or make the appropriate corrections
• The assistance or corrections must lead to an improved outcome
Faculty participation rates

• Over the past three years,
• Between 68 and 78 percent of all course sections with an “FYI eligible” student enrolled participated in the program by submitting a report
• Approximately 35 percent of FYI eligible students received an alert indicating potential academic difficulty
• Our coverage can be improved in terms of both participation and expansion of the program to students beyond the first year
Our Blackboard Predict pilot

• In addition to expanding coverage, we ask:
  • Do we properly identify students at risk?
  • Can we improve the program by giving students alerts prior to week 6?
Why did UMBC proceed with this data-informed intervention?
Why did UMBC proceed with this data-informed intervention?

When poll is active, respond at PollEv.com/thomaspennis515

Big bets on Analytics

Institutional history with First Year Intervention Program

Improve identification and cast a wider net

All of the above
Why did UMBC proceed with this data-informed intervention?

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Big bets on Analytics

Institutional history with First Year Intervention Program

Improve identification and cast a wider net

All of the above  ✔️ 0%
Step 2 of the pilot: model validation

• We selected 10 different classes in seven different subject areas
  • For us to select a course the instructor must be an active user of the LMS
    • Sharpens the predictions of the model
  • We call a prediction of a grade lower than C as a “predicted fail”
• We defined the probability of failing a course as p.
  • If a student has $p > p^*$ (where $p^*$ is a threshold probability failing the course) then Blackboard Predict predicts “fail.”
• We chose an initial value of $p^* > 0.50$
Validation results

• Our project timeline called for validating results from Blackboard Predict against the existing FYI program for the Fall 2017 term

• The next three slides show the performance of
  • The existing FYI program alone
  • Blackboard Predict alone (week 7 predictions)
  • A combination of using the existing FYI program in conjunction with Blackboard Predict
A quick refresher

• Remember the distinction between type I and type II errors:
Pass rates for FYI alerts

- The percentage is the pass rate for the number of students in the cell (that is, 26% of the 76 students receiving an FYI in CHEM 101 passed the course)

- FYI alerts are reasonably good at detecting students likely to fail, but the low pass rates for students who do not receive FYI alerts are indicative of type II errors...false negatives)

Course pass rate by FYI Alert status.
Number of students per category is shown below the category's pass rate.

<table>
<thead>
<tr>
<th>Received FYI Alert</th>
<th>BIOL 302L</th>
<th>PHYS 111</th>
<th>PSYC 100</th>
<th>PSYC 100</th>
<th>CHEM 352</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>90%</td>
<td>77%</td>
<td>97%</td>
<td>95%</td>
<td>79%</td>
</tr>
<tr>
<td></td>
<td>91</td>
<td>164</td>
<td>108</td>
<td>113</td>
<td>114</td>
</tr>
<tr>
<td>Yes</td>
<td>0%</td>
<td>33%</td>
<td>55%</td>
<td>75%</td>
<td>0%</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>12</td>
<td>42</td>
<td>16</td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Received FYI Alert</th>
<th>CHEM 101</th>
<th>GES 110</th>
<th>MATH 150</th>
<th>MATH 152</th>
<th>SCI 100</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>77%</td>
<td>82%</td>
<td>76%</td>
<td>75%</td>
<td>91%</td>
</tr>
<tr>
<td></td>
<td>214</td>
<td>118</td>
<td>67</td>
<td>140</td>
<td>99</td>
</tr>
<tr>
<td>Yes</td>
<td>26%</td>
<td>25%</td>
<td>25%</td>
<td>.</td>
<td>0%</td>
</tr>
<tr>
<td></td>
<td>76</td>
<td>16</td>
<td>12</td>
<td>.</td>
<td>1</td>
</tr>
</tbody>
</table>
Pass rates for Bb Predict

• Blackboard Predict does a good job predicting students who will pass. However, our initial choice of \( p^* > 0.50 \) appears too conservative (High actual pass rates for students predicted to fail, false positives, or type I errors).

Course pass rate by Bb Predict prediction for 7th week of SP 2017 semester.
Number of students per category is shown below the category’s pass rate.

<table>
<thead>
<tr>
<th>Course</th>
<th>BIOL 302L</th>
<th>PHYS 111</th>
<th>PSYC 100</th>
<th>PSYC 100</th>
<th>CHEM 352</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Predicted Pass</strong></td>
<td>91%</td>
<td>97%</td>
<td>93%</td>
<td>98%</td>
<td>92%</td>
</tr>
<tr>
<td>Number of students</td>
<td>54</td>
<td>78</td>
<td>99</td>
<td>86</td>
<td>71</td>
</tr>
<tr>
<td><strong>Predicted DFW</strong></td>
<td>87%</td>
<td>55%</td>
<td>71%</td>
<td>81%</td>
<td>54%</td>
</tr>
<tr>
<td>Number of students</td>
<td>38</td>
<td>98</td>
<td>51</td>
<td>43</td>
<td>46</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Course</th>
<th>CHEM 101</th>
<th>GES 110</th>
<th>MATH 150</th>
<th>MATH 152</th>
<th>SCI 100</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Predicted Pass</strong></td>
<td>90%</td>
<td>93%</td>
<td>90%</td>
<td>99%</td>
<td>94%</td>
</tr>
<tr>
<td>Number of students</td>
<td>51</td>
<td>72</td>
<td>39</td>
<td>68</td>
<td>81</td>
</tr>
<tr>
<td><strong>Predicted DFW</strong></td>
<td>58%</td>
<td>55%</td>
<td>47%</td>
<td>53%</td>
<td>74%</td>
</tr>
<tr>
<td>Number of students</td>
<td>239</td>
<td>62</td>
<td>40</td>
<td>72</td>
<td>19</td>
</tr>
</tbody>
</table>
Using the two processes together increases accuracy

Green and red shaded categories show "agreement" between FYI Alert and BbPredict on expected pass or expected failure in a course.

<table>
<thead>
<tr>
<th>BIOL 302L</th>
<th>PHYS 111</th>
<th>PSYC 100 (2060)</th>
<th>PSYC 100 (2061)</th>
<th>CHEM 352</th>
</tr>
</thead>
<tbody>
<tr>
<td>Predicted DFW</td>
<td>Predicted DFW</td>
<td>Predicted DFW</td>
<td>Predicted DFW</td>
<td>Predicted DFW</td>
</tr>
<tr>
<td><strong>Received FYI Alert</strong></td>
<td><strong>No</strong></td>
<td><strong>Yes</strong></td>
<td><strong>No</strong></td>
<td><strong>Yes</strong></td>
</tr>
<tr>
<td><strong>No</strong></td>
<td>91%</td>
<td>89%</td>
<td>97%</td>
<td>59%</td>
</tr>
<tr>
<td></td>
<td>54</td>
<td>37</td>
<td>77</td>
<td>87</td>
</tr>
<tr>
<td><strong>Yes</strong></td>
<td>.</td>
<td>0%</td>
<td>100%</td>
<td>27%</td>
</tr>
<tr>
<td></td>
<td>.</td>
<td>1</td>
<td>1</td>
<td>11</td>
</tr>
</tbody>
</table>

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<thead>
<tr>
<th>CHEM 101</th>
<th>GES 110</th>
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<tr>
<td>Predicted DFW</td>
<td>Predicted DFW</td>
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<td>Predicted DFW</td>
<td>Predicted DFW</td>
</tr>
<tr>
<td><strong>Received FYI Alert</strong></td>
<td><strong>No</strong></td>
<td><strong>Yes</strong></td>
<td><strong>No</strong></td>
<td><strong>Yes</strong></td>
</tr>
<tr>
<td><strong>No</strong></td>
<td>95%</td>
<td>72%</td>
<td>94%</td>
<td>67%</td>
</tr>
<tr>
<td></td>
<td>44</td>
<td>170</td>
<td>69</td>
<td>48</td>
</tr>
<tr>
<td><strong>Yes</strong></td>
<td>57%</td>
<td>23%</td>
<td>67%</td>
<td>14%</td>
</tr>
<tr>
<td></td>
<td>7</td>
<td>69</td>
<td>3</td>
<td>14</td>
</tr>
</tbody>
</table>
Model Validation was...
Model Validation was...

When poll is active, respond at PollEv.com/thomaspennis515

- Ignored
- Intended to identify pregnancy
- Based on adding Type I Errors with Type II Errors to make Type III Errors
- Rigorous, and based on comparison with historic FYI results
Model Validation was...

When poll is active, respond at PollEv.com/thomaspennis515

Ignored

0%

Intended to identify pregnancy

Based on adding Type I Errors with Type II Errors to make Type III Errors

Rigorous, and based on comparison with historic FYI results
Step 3: Designing a trial intervention

• Our project plan called for working with a few instructors and departments to send analytics-based alerts.
• Because of type I errors, these alerts are gentle and empathetic; more in the nature of a behavioral nudge.
• We implemented more direct alerts for students receiving both an FYI and an analytics-based predicted fail.
• The alerts are sent to the student over their instructors’ signature.
Which course to choose?

• Here, we got lucky. Not only did we have a willing faculty partner who is “LMS-active” and teaches a large class, but that class is also important.

• How do we know? From results obtained from another part of our analytics ecosystem.

• Civitas Learning is one of our partners. We used Illume-Courses to help guide our selection of Psych 100 for the initial pilot.
• Psych 100 is a yellow flag course and has the highest grade signal at UMBC
What do you believe is the best way to support behavioral modification?

- Positive Reinforcement (Reward)
- Negative Reinforcement (Loss Aversion)
- Punishment
Step 4: Delivering the nudge

• Students with only a predictive alert (no FYI)

Dear {{user.first_name}},

I know this time of year can be busy and stressful, and while the end of the semester seems like it may take forever to get here, it’ll arrive before you know it. I’m checking in with you to make sure that you’re OK, and to offer you some resources or support if you need them.

Prior successful students have told me and my colleagues that one of the most useful steps they took was to talk to their professor during office hours or after class or to see their advisor.

I also want to let you know about the LRC’s Action Resource Center web page for ways that can help you with your classes and offer support if you need it. Don’t be reluctant to use it! Thousands of students take advantage of these resources every semester. They work.

If you’re doing well and want to do better, follow the link to Identifying Your Strengths to build on them. If you feel like something’s wrong but you don’t know how to fix it, try following the link to Explore Your Obstacles.

{{instructors name and contact information}}

• Students with both a predictive alert and an FYI

Dear {{user.first_name}},

I’m writing to follow up on the FYI that you received from my class. I know this time of year can be busy and stressful anyway, and an FYI alert can add to it. Many people have received alerts in many UMBC classes and have gone on to pass them. You’re not alone. The purpose of an FYI is to let you know that it’s important to make an adjustment while there’s time to improve your grade. Don’t delay making that adjustment.

UMBC has many resources to support you in succeeding in my class and in others. Past students have found that one of the most useful steps they took was to talk to their professor or to see their advisor. Please make time to talk to one or both of us.

I also want to let you know about the Action Resource Center web page for ways that can help you with your classes and offer support if you need it. Don’t be reluctant to use it! Thousands of students take advantage of these resources every semester. They work.

A good strategy is to build on what you do well and improve the things you do less well. Follow the link to Identifying Your Strengths to build on them. If you feel like something’s wrong but you don’t know how to fix it, try following the link to Explore Your Obstacles.

My colleagues and I are here to help if you need it.

{{instructors name and contact information}}
UMBC has around 65% read rates for its nudge campaigns. How does this rate compare with what you would expect at your own institution?

- UMBC's are higher
- UMBC's are lower
- Ours are fairly similar
- Not sure
Please select the *incorrect* conclusion for the following sentence: The Pilot design
Please select the *incorrect* conclusion for the following sentence: The Pilot design

- When poll is active, respond at PollEv.com/thomaspennis515

- worked along side the existing FYI system

- used nudge messaging stressing to students how hopeless their academic situation was

- had sampling informed through Civitas signal

- had voluntary participation
When poll is active, respond at PollEv.com/thomaspennis515

\[ 0\% \]

Please select the incorrect conclusion for the following sentence: The Pilot design worked along side the existing FYI system used nudge messaging stressing to students how hopeless their academic situation was had sampling informed through Civitas signal had voluntary participation
Step 5: Assessing the pilot results

• 6-course sections participating in this pilot (1 SP18; 5 FA18), totaling 873 unique students
• 38 students identified by Bb Predict as at-risk and subsequently received nudge messaging.
• 16 were not identified by the FYI system; the other 22 students received both notifications.
• 19% of students in the participating courses received at least one early intervention notification
• 51 peer courses were added to the Bb Predict data pull, totaling 2,406 unique students
• A total of 57 courses including 3,065 unique students comprise the full sample
Step 5: Assessing the pilot results

• 78 total students predicted to receive a DFW (2.25%) using Bb Predict alone (10% of the observed DFWs)

• Consistent with the model validation, FYI alerts were more accurate at predicting failure
  • Students predicted to receive a DFW were 7x more likely to ultimately earn DFW, and those receiving an FYI alone were 10x more likely (p<.001)

• Also consistent with the model validation, using the two systems together increased accuracy
  • Those identified by both systems were nearly 14x more likely to earn a DFW (p<.001), and they received a DFW 78% of the time

• Students who received only the Bb intervention failed relatively less (only 5x more likely to earn a DFW)

• Of students predicted to earn a DFW, those receiving a Bb Predict-informed intervention earned fewer DFWs compared with students that did not (15.6%; p <.01).
The pilot’s bottom line

• The nudge messaging informed through a combination of these machine and human intelligences improved student success

• The two systems working together are accurate nearly 80% of the time in predicting a DFW

• There is a statistically significant decrease in the chances of a negative outcome for students who received a nudge informed by the Bb Predict algorithm
Which of the following statements most true
Which of the following statements most true

- We were able to successfully deploy a pilot during the semester
- The two systems working together are accurate nearly 80% of the time in predicting a DFW
- The nudge campaign appears to not hurt students, and may be improving their chances of academic success
- All of the above
Which of the following statements most true

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- We were able to successfully deploy a pilot during the semester
- The two systems working together are accurate nearly 80% of the time in predicting a DFW
- The nudge campaign appears to not hurt students, and may be improving their chances of academic success

All of the above 0%
Scaling, deepening, and broadening our work

• We have expanded the pilot to additional courses this term. Currently, we’re working with 3 distinct courses and 8 sections, totalling 635 students
• We’re adopting a bottom up strategy for innovations (a coalition of the willing)
  • We’re asking to do things for faculty, rather than asking faculty to do things for us
  • This strategy was certainly helped from our first participant who wrote to colleagues saying:

  “I thought I'd throw a pitch here......it really did not deter from my usual mode of alerting students when they needed FYI alerts or a nudge that they were not passing at midterm. [This] simply enhance[s] my usual alert.

  I just tell students they will get multiple alerts and they need to pay attention and take action. No more work on my part. However, really interesting data on retention at UMBC. If it gets the student to take action....all the better. I have 600 students in fall and 400 in spring....so I appreciate the extra set of eyes!”
Deepening our research and our work

• We’re working to build a next generation learning records store to integrate more information streams to sharpen our predictions and create more tailored interventions

• A very interesting and promising component of this work involves gathering information from electronic textbooks
Relationship between (VitalSource + Learn Actions), and Class Final Grades
Broadening our work

• We’re looking for other courses that represent progression barriers for our students.

• A low passing grade in Precalculus represents one of those barriers
Dear [student first name]

We've noticed that you're repeating Math <NUMBER> this fall. You're not alone. Math courses can be challenging, and many people have retaken them on the way to successfully completing their degrees.

We have a very effective, free, resource to help you. The Math Lab, located on the first floor of the library, is a place where you can get help. Using the Math Lab makes your study time more productive.

Did you know that students repeating 100-level math classes who use the Math Lab increase their chances of passing with a C or better by nearly 20 percent?

We wish you the best of luck in all your classes this term. Keep reminding yourself that hard work and perseverance will pay off in the end.

To see the schedule for tutoring in your class visit http://umbc.edu/go/mathlab.

Math Lab Nudge Results

- One out of three people taking a foundational math class will fail it
- One out of two people repeating it will fail it again
- One out of five people sitting in a foundational math class is a repeater
- But only one out of ten people taking a class (for the first time or as a repeater) will use math tutoring

Our evidence suggests that using math tutoring can reduce the chances of failing for a repeater somewhere between 10 and 20 percent

In addition to the nudge you see here, students who respond by using math tutoring receive a second nudge reinforcing their choice

Positive reinforcements matter
### Organizing our work: Right Time, Right Message, Right Person

#### Student Agency

<table>
<thead>
<tr>
<th>Week 1 (thru add/drop)</th>
<th>Week 4</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Syllabus Quiz</strong></td>
<td></td>
</tr>
<tr>
<td><strong>PSCY100</strong>: Since SP17, students who didn't take SQ were 4x more likely to earn DFW ($p&lt;.001$, $n=1,455$)</td>
<td></td>
</tr>
<tr>
<td><strong>ECON122</strong>: Students req'd to take SQ before submitting 1st assignment for credit. Class earns 20% higher grade on dept. common final exam.</td>
<td></td>
</tr>
<tr>
<td><strong>Nudging Course Repeaters</strong>: Go to the Math Lab! It works.</td>
<td></td>
</tr>
<tr>
<td><strong>High Credit, Low GPA Nudge</strong>: “Are you sure?”</td>
<td></td>
</tr>
<tr>
<td><strong>Digital Tool Usage</strong></td>
<td></td>
</tr>
<tr>
<td><strong>LMS &amp; eTextbooks</strong>: 70-98% predicting $\geq$C final grades ($p&lt;.005$, $n=986$ in 5 FA17 courses)</td>
<td></td>
</tr>
<tr>
<td><strong>Check My Activity</strong>: Students can compare LMS activity w/anonymouse summary of course peers earning same, higher or lower grade on any assignment -- if instructors post grades</td>
<td></td>
</tr>
<tr>
<td><strong>High Credit, Low GPA Nudge</strong>: “Here’s where other students have gone to get help, if you need it.”</td>
<td></td>
</tr>
</tbody>
</table>

#### Intrusive Advising

<table>
<thead>
<tr>
<th>Week 6-8</th>
<th>Week 12 &amp; beyond</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Midterm Alerts &amp; Nudges</strong></td>
<td><strong>Finish/Start Strong</strong></td>
</tr>
<tr>
<td><strong>First Year Intervention (FYI) alert</strong> asks faculty to ID students in jeopardy of D/F “if semester ended tomorrow.” (~60% go on to get $\geq$C)</td>
<td></td>
</tr>
<tr>
<td><strong>Bb Predict</strong>: 87% accurate predicting $\geq$C by week 4, AYs 16-18).</td>
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<td><strong>Two Empathetic Nudges</strong>: 1) to predicted DFW and 2) to predicted DFW &amp; FYI (slightly different but key is “talk to your instructor” &amp; seek tutoring).</td>
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<td><strong>2nd Nudge of Course Repeaters</strong> to use the math lab. “You’ve made a good choice. Keep going!”</td>
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<td><strong>Early Registration</strong>: 50% of non-persisting students enroll for the next term less than 40 days before 1st day of classes.</td>
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<tr>
<td><strong>Countdown Timer &amp; Checklist</strong></td>
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<tr>
<td>- Verify Declared Degree</td>
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<tr>
<td>- Schedule Advisor Meetings</td>
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<tr>
<td>- Review course options</td>
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<tr>
<td>- Meet with advisor</td>
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<td>- Register for classes</td>
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<tr>
<td><strong>Last Day to Withdraw</strong> (Week 11)</td>
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<tr>
<td><strong>Course Repeat Policy</strong></td>
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</table>
Wrapping up

• What does an analytics ecosystem look like in 10 years?
  • Scale and synthesis: It’s time to stop saying that “analytics is not a silver bullet” and start building ecosystems to build a better mousetrap (sorry)

• Addressing organizational challenges
  • Student success requires coordinated actions across many areas of the university, which is in fundamental tension with decentralized governance
  • Given the strategic environment, how does this get resolved? Either top level intervention to centralize functions, a budgetary model, or key performance indicators that provide accountability and incentives
  • If we don’t do this proactively, our external stakeholders may insist

• Change or be changed
What's not on our list of to-dos?
What's not on our list of to-dos?

When poll is active, respond at PollEv.com/thomaspennis515

- Apply lessons learned to other domains
- Improve the predictive validity of existing models
- Further pilots, scale, and iteration
- Skynet
What's not on our list of to-dos?

When poll is active, respond at PollEv.com/thomaspennis515

Apply lessons learned to other domains

Improve the predictive validity of existing models

Further pilots, scale, and iteration

Skynet 0%
Evaluate Sessions and Win!

- Download and open OLC Conferences mobile app
- Navigate to specific session to evaluate
- Select “Evaluate Session” on session details screen (located under session type and track)
- Complete session evaluation*

*Each session evaluation completed (limited to one per session) = one contest entry

**Five (5) $25 gift cards** will be awarded to five (5) individuals
Must submit evals using the OLC Conferences mobile app or website