Riding the Data Wave: Using Predictive Analytics and LMS Data to Support Student Success

PRESENTED BY:
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With thanks to our Campus Partners:
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Marc Pastor and Maureen Guarcello (San Diego), and Andrew Roderick (San Francisco)
Session Outcomes

▪ Identify conditions for investing in predictive analytics
▪ Define strategies for a successful implementation, including course and faculty selection considerations
▪ Share high-impact practices that are likely to translate predictive analytics into student success
▪ Understand how LMS learning data could advance student success goals, increase graduation rates
▪ Obtain practical information about capitalizing on LMS data to increase student success
System Demographics

- 23 campuses
- 474,600 students
- 49,000 faculty & staff
- Most ethnically, economically, and academically diverse student body in the nation
- One of the most affordable universities in the U.S.
Grad Initiative 2025 | Learning Data

- Graduation Initiative 2025 is the CSU's latest initiative to increase graduation rates for all students while eliminating opportunity and achievement gaps.

- The LMS data is the ONLY “live” learning data that can be mined during a term to develop interventions that can prevent students from dropping or failing the course.
  - An opportunity to redesign key courses
  - Initiate a culture of data analytics in academic offerings

- Engaging together to develop capacity, community and knowledge base in the CSU on the use of learning analytics for student success.

CSU The California State University
Working for California
Blackboard Predict and XRay Learning Analytics

Blackboard Predict
- Blackboard Predict uses data from your existing student information and learning management systems to build a predictive model that provides clear, actionable early alerts to faculty and advisors.

LMS AGNOSTIC – WORKS WITH CANVAS

X-Ray Learning Analytics
- X-Ray Learning Analytics provides deep insight into learner behaviors and identifies trends that affect achievement within Moodle. At the institutional level, X-Ray analyzes cross-course results to uncover trends.
Blackboard Predict

How it works
- Aggregate student activity data
- Present risk report to faculty/advisors

Predictive Model
- Current class activity from LMS
- Past student information from SIS
Chico State’s Pilot Goals

1. To assess the usefulness of Bb Learn Predict as an “early warning system”
2. To work with faculty, faculty advisors, and staff (academic advisors) to assess receptivity to this approach
3. Explore student lens, capturing student feedback on value of the tool
4. Empower faculty with course data to support enhanced teaching and learning
5. To reduce D,F,W,WU&I grades in the high challenge/bottleneck courses
Blackboard Predict uses student information from PeopleSoft and course information from Blackboard to build a predictive model for actionable early alerts to faculty and advisors. The data is delivered through Blackboard Learn as part of a Risk Report.
Faculty Dashboard - Student View

Student Details

Ryan Cerney
005934527 | U | Bus Inf Sys: Mgmt Inf Sys (BS)

Performance

Student Performance

- Probability of Passing: Medium
- Current Grade: 89%
- Average Activity Level: 0:41 hour/day

Graph: Probability of Getting a Passing Course Grade

- High Probability
- Medium Probability
- Low Probability
**Student Dashboard**

### Grade Projection

Projections based on your previous grades in the course

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>If you get all maximum grades</td>
<td>98%</td>
</tr>
<tr>
<td>If you keep the same pace</td>
<td>86%</td>
</tr>
<tr>
<td>If you get all minimum grades</td>
<td>10%</td>
</tr>
</tbody>
</table>

**Course Outcomes Based on Future Grades**

![Graph showing course outcomes based on future grades]

- Graded Assignments
- Max Possible Grade
- Pace Grade
- Min Possible Grade
## Advisor Dashboard

<table>
<thead>
<tr>
<th>Name</th>
<th>GPA</th>
<th>Degree</th>
<th>First Gen</th>
<th>Academic Load</th>
<th>Pell Eligible</th>
<th>Probability of Passing</th>
<th>Courses</th>
</tr>
</thead>
<tbody>
<tr>
<td>June Alexander</td>
<td>2.75</td>
<td>BS</td>
<td>NO</td>
<td>YES</td>
<td>44%</td>
<td></td>
<td>ENGL0101, PHYS0101, GERM0101</td>
</tr>
<tr>
<td>Paula Allen</td>
<td>2.76</td>
<td>BA</td>
<td>NO</td>
<td>NO</td>
<td>34%</td>
<td></td>
<td>ENGL0101, PHYS0101, GERM0101</td>
</tr>
<tr>
<td>Julie Alligood</td>
<td>2.66</td>
<td>BS</td>
<td>--</td>
<td>--</td>
<td>49%</td>
<td></td>
<td>ENGL0101, PHYS0101, GERM0101</td>
</tr>
<tr>
<td>Katherine Anth...</td>
<td>2.77</td>
<td>BS</td>
<td>--</td>
<td>NO</td>
<td>48%</td>
<td></td>
<td>CHEM0101, NURS0101, PHYS0101</td>
</tr>
<tr>
<td>Carmelo Arroyo</td>
<td>2.77</td>
<td>BS</td>
<td>NO</td>
<td>NO</td>
<td>40%</td>
<td></td>
<td>CHEM0101, NURS0101, PHYS0101</td>
</tr>
</tbody>
</table>
Relative Activity Compared to Other Students in Class

Dots represent student activity. Bigger dots indicate more activity.
CSU Learning Analytics Collab
Pilot Campuses

**Blackboard Predict**

- **Chico State**
  - Fall 2016 FTE: 16,343
  - LMS: Bb Learn ‘17 Q2, CU1, Self-Hosted
  - SIS: PeopleSoft
  - 13 Faculty
  - 1500 Student Pilot

- **San Diego State**
  - Fall 2016 FTE: 30,798
  - LMS: Bb Learn, Managed Hosted
  - SIS: Custom
  - 11 Faculty
  - 5400 Student Pilot

**X-Ray Learning Analytics**

- **San Francisco State**
  - Fall 2016 FTE: 24,107
  - LMS: Moodle, Self-Hosted
  - SIS: PeopleSoft
  - TBD # of faculty

- **Sonoma State**
  - Fall 2016 FTE: 9,500
  - LMS: Moodle, Self-Hosted
  - SIS: PeopleSoft
  - < 10 faculty/courses
XRAY Pilot at Sonoma State

- Pilot run as a faculty development project using a faculty learning community model
- Detailed analysis was done to select pilot courses based on LMS use, frequency of offerings, and DFW rate
- Campus in the midst of standing up a student’s affairs and advising unit, so plan was to use student assistants working with pilot instructors.
XRAY Pilot at Sonoma State

- Problems encountered with version of PHP used in their on-premise Moodle instance - Updated and improved version of XRAY could not be used.
  - Campus decided to do an LMS review, and leaning now toward Canvas
  - The XRAY pilot has been put on hold, pending the LMS decision
- In the future, use of gradebook is crucial, with instructors having recorded assessments many times each month
XRAY Pilot at San Francisco State

- Evaluate XRAY for all LMS users, as opposed to a number of course sections.
  - Courses need to be better designed, particularly in use of gradebooks, before implementing a risk model.
- Sees value in a more robust and detailed dashboard, more so than in the risk model and predictive aspect.
- Working with XRAY to improve its dashboard for faculty use.
16 courses

- Faculty (non)confidence in predictions
- What is causing the prediction that this student will fail? Multivariate factors
- First 4 weeks is critical for accurate prediction
- Choosing the kind of intervention to consider once a student is identified at risk?
- Gradebook usage - calculated columns, weighted columns
Organic Chemistry - Traditionally difficult course

▪ “Early Warning” - Can you give a reasonable prediction before week 4 of a semester?
▪ 75% of students at high risk in week 4
  ▪ That’s not going to lead faculty into engaging an “early warning” conversation with each student
Bb Predict Pilot @San Diego State Spring 2018

- 4 courses and 2000 students
- Faculty were in CSU “Course Redesign” program
- Supplemental Instruction is being used as an intervention to difficult courses like these
- Working closely with an Instructional Designer for best LMS/Gradebook usage
  - ...who is also a researcher
Summary of Lessons Learned

- Choice of courses
  - Got LMS Data? Using Gradebook? Columns?
  - Consider using Instructional Designers
- Non-typical cross-campus project with big intersection of stakeholders
  - Mixing enterprise data (SIS, LMS, IR, Warehouse)
  - Mixing advisors, faculty, fac dev, ID, technologists
- So you got some predictions, now what?
  - Who does what action to reach out to students?
  - Why are the students predicted to fail?
  - So what’s the intervention?
Takeaways from the Session

- What did you learn in this session that you can take back to your campus and put into action?
- Based on this discussion, do you have specific action(s) you will take when you return back to campus?
  - Interested in a learning analytics pilot group?
  - Who will you talk to on your campus in order to begin the learning analytics campaign?
- Do you think your campus is ready for a learning analytics project?
  - Do you think you might have a champion?
  - How broad is the LMS use amongst faculty?
  - What is the depth of that LMS use?
  - Do you have instructional design capacity?
  - Does your campus have a centralized advising structure?
  - How is the relationship between IT, Faculty development, Academic Technology support, Advising and Institutional Research?
Contact and Resources

Session slides available @ http://tiny.cc/ELI2018LA

CSU Course Redesign with Technology @ http://calstate.edu/courseredesign