DIGITAL AND ADAPTIVE LEARNING: WHAT TO DO AND WHAT ARE THE RESULTS?

RICK MIRANDA, PROVOST, COLORADO STATE UNIVERSITY
What is Adaptive Learning?

“As an approach to creating a personalized learning experience for students, adaptive learning takes a sophisticated, data-driven, and in some cases, non-linear approach to instruction and remediation, adjusting to a learner’s interactions and demonstrated performance level and subsequently anticipating what types of content and resources learners’ need at a specific point in time to make progress.”

APLU Accelerating the Adoption of Adaptive Courseware Grant

CROSS-INSTITUTION COLLABORATION

- Targeting similar programs and courses
- Adopting from a list of approved adaptive courseware suppliers and products
- Sharing information within the cohort by campus-based program managers
- Common reporting requirements

FACULTY ENGAGEMENT METHODS

- Incentives (money, time, teaching support)
- Training and instructional design support
- Department-level adoption decisions
- Peer learning communities
- Senior leadership investment and recognition
RESULTS:
Course Content

After Six Months:
22,000 enrollments

- Humanities, 12%
- Other Disciplines, 10%
- Biology/Life Sciences, 12%
- Business, 6%
- Chemistry, 16%
- Mathematics, 13%
- Physics, 13%
- Economics, 10%
- Psychology, 8%
Comparison of Courseware Adoption from Fall 2016 to Spring 2017

2016: 6
2017: 12
Commitment to Student Success

Six-year graduation rate of 80% for Fall 2020 cohort
Eliminate all success gaps

Adaptive Courseware Grant Course Targets

- High-enrollment
- High D/F/W rate
- High number of Pell-eligible students
- General education
- Gateway courses within a discipline area
- CSU Top 10 First Year Courses that predict graduation
Implementation Progress to Date

Goal 12,300-16,300 enrollments

**YEAR 1**
- First Year French I
- First Year French II
- First Year German I
- First Year German II
- First Year Spanish I
- First Year Spanish II
- General Physics I
- General Physics II
- Principles of Microeconomics

**Anticipate 3,124 enrollments**

**YEAR 2**
- First Year French I
- First Year French II
- First Year German I
- First Year German II
- First Year Spanish I
- First Year Spanish II
- General Physics I
- General Physics II
- Principles of Microeconomics

**Anticipate 8,300 enrollments**

**YEAR 3**
- First Year French I
- First Year French II
- First Year German I
- First Year German II
- First Year Spanish I
- First Year Spanish II
- General Physics I
- General Physics II
- Principles of Microeconomics

**Anticipate 15,000-22,000 enrollments**

**Currently Recruiting**
- American Government & Politics
- Biology of Organisms - Animals & Plants
- General Chemistry series
- General Psychology
- General Sociology
- Introduction to Financial Accounting
- Introduction to Managerial Accounting
- Media in Society
- Moral and Social Problems (Philosophy)
- Physics for Scientists & Engineers I
- Physics for Scientists & Engineers II

**3,124 enrollments**

**Designing / Piloting**
- Appreciation of Philosophy
- Attributes of Living Systems
- Fundamentals of Accounting
- Introduction to Astronomy
- Introduction to Mechanical Engineering
- Humans and Other Animals
- Principles of Human Biology
- Principles of Macroeconomics

**11/13/2017**

THE PERSONALIZED LEARNING CONSORTIUM AT APLU
## Courseware Redesign Process

<table>
<thead>
<tr>
<th>Phase</th>
<th>Activities</th>
</tr>
</thead>
</table>
| (Re)Design    | • Courseware selection  
                 • Courseware integration  
                 • Backward design & principles of learning science  
                 • High Impact Practices  
                 • Assessment techniques for large classes  
                 • Community of Practice |
| Implementation| • Instructional Designers troubleshoot  
                 • Courseware hiccups  
                 • Active learning strategies  
                 • Community of Practice |
| Revision      | • Open door  
                 • Community of Practice |
Experienced, persuasive faculty = Evidence of success + Trust + Influence

• Leverage faculty allies to capitalize on successful relationships
  • Previous redesign partners

• Instructional innovators
  • Technology “power users” – LMS, clickers, mobile learning, etc.
  • Strong attendance at professional development events
  • Already have dabbled with adaptive platforms

• Identify courses with the greatest potential for successful outcomes
  • Greatest need based on student performance
  • Close match with targeted courses (DFW, Pell eligible, etc.)

• Evidence supporting success of adaptive courseware and high impact teaching practices
  • Evidence-based practices with discipline
Faculty Adoption = quality content + functionality + ease of use + student cost

amount of time faculty can allocate to the process

- Negotiation skills require patience, persistence and creativity
- Flexible scaling strategy – Full vs partial implementation
  - Pilot sections
- Plan for sustainability – potential for staffing changes after implementation
- Don’t underestimate the power of departmental culture
  - Faculty autonomy -- *one* section vs *all* the sections...
  - Regular check-ins are needed to keep up departmental staffing changes
- Formalize the recruitment and implementation process
  - Share expectations and MOU early in the process
- Support adaptive courseware, high-impact practices *and access to active learning classrooms*
Looking Forward

- Showcase faculty and their successes
  [http://tinyurl.com/CSU-AdaptiveCourse](http://tinyurl.com/CSU-AdaptiveCourse)
- Stay the course
  - Continue to recruit faculty participants
  - Transition faculty from participants to champion/recruiter
ARTHUR BLAKEMORE
VICE PROVOST FOR ACADEMIC SUCCESS, ARIZONA STATE UNIVERSITY
Adaptive-Active Learning

Progress to Date
## Redesign of General Education to an Entire Major

### Redesign of Gateway Classes

<table>
<thead>
<tr>
<th>MATH</th>
<th>Total Students Served</th>
</tr>
</thead>
<tbody>
<tr>
<td>- College Algebra (at scale)</td>
<td></td>
</tr>
<tr>
<td>- College Mathematics (at scale)</td>
<td>AY 16-17</td>
</tr>
<tr>
<td>- Pre-calculus (pilot)</td>
<td>6,200</td>
</tr>
<tr>
<td>- The Living World (at scale)</td>
<td>8,600</td>
</tr>
<tr>
<td>- Introductory Chemistry (at scale)</td>
<td>17,000 +</td>
</tr>
<tr>
<td>- Introduction to Psychology (scaling)</td>
<td></td>
</tr>
<tr>
<td>- Introduction to Physics (scaling)</td>
<td></td>
</tr>
<tr>
<td>- American History I (scaling)</td>
<td></td>
</tr>
<tr>
<td>- American History II (pilot)</td>
<td></td>
</tr>
<tr>
<td>- Macroeconomic Principles (pilot)</td>
<td></td>
</tr>
<tr>
<td>- Microeconomic Principles (pilot)</td>
<td></td>
</tr>
<tr>
<td>- AST (I and II) (planned)</td>
<td></td>
</tr>
<tr>
<td>- BIO Major (under development)</td>
<td></td>
</tr>
</tbody>
</table>
Goals

• Improve student success in the course

Promote higher learning skills – critical thinking & problem solving

Improve student success in subsequent courses

Improve retention and graduation

Build a community of universities and educators that share best practices, innovations, etc.

DO ALL OF IT AT SCALE
Flipped and Synced

Optimize high-tech (adaptive) and high-touch (active) learning

Active Learning in class

Adaptive Learning before class

Bloom’s Taxonomy
Beyond Adaptive: Interactive
<table>
<thead>
<tr>
<th>Subject</th>
<th>Delivery</th>
<th>C or better</th>
<th>A/B</th>
<th>Prefer system to other formats?</th>
<th>Deeper understanding</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PSY</strong></td>
<td>Lecture</td>
<td>73%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Adaptive-active</td>
<td>88%</td>
<td>83%</td>
<td>81% (Agree)</td>
<td>84% (Agree)</td>
</tr>
<tr>
<td><strong>ECON</strong></td>
<td>Lecture</td>
<td>57%</td>
<td>22%</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Adaptive-active</td>
<td>81%</td>
<td>50%</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>BIO</strong></td>
<td>Lecture</td>
<td>76%</td>
<td>53%</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Adaptive-active</td>
<td>92%</td>
<td>64%</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Col. Algebra</strong></td>
<td>Lecture</td>
<td>69%</td>
<td>38%</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Adaptive-active</td>
<td>78%</td>
<td>62%</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Low placement</strong></td>
<td>Lecture</td>
<td>31%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Adaptive-active</td>
<td>74%</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Same instructor; same assessments. Average over three semesters.

** Same instructor; same assessments. Results of first two midterms.

*** Developmental math students mainstreamed.
SUSANA RIVERA-MILLS
VICE PROVOST, ACADEMIC PROGRAMS AND LEARNING INNOVATION,
OREGON STATE UNIVERSITY
Why Adaptive Learning? Why Now?

- **Focus**
- **Alignment**
- **Impact**

**Potential Impact:**

- 16,798 Students
- 20% of Gen Ed Enrollment

- Math
- Psychology
- Chemistry
- Economics
- Statistics

11/13/2017

THE PERSONALIZED LEARNING CONSORTIUM AT APLU
Adaptive Learning as a Mechanism for Course Transformation

Flexible Policies
Course Structure
Class Size
Faculty Roles

Faculty & Department

Adaptive Learning Project

Sustainable Course Transformation
Promising Early Results in Math & Psychology

**College Algebra**
- Withdraw rate decreased from 17% to 10%
- DFWU* rate decreased from 40% to 38%
- Best metrics in last 5 years

**General Psychology**
- Historic DFWU rate of 26%
- DFWU rates range 2% to 6% for redesigned course (which includes many changes in addition to adaptive learning).

*DFWU Rate includes course withdraws as well as grades of D, F, or Unsatisfactory received*
Pre-term, mid-term, & post-term student surveys measuring motivation, learning approach, satisfaction, and perceived value.

I have become much more confident in doing math. I still make mistakes, but I can catch and correct them.

I got a deeper understanding of mathematical topics that I had struggled with in the past.

The OSU Math Department has really stepped up their game when it comes to the format and learning tools!

This class was engaging, interactive, and educational.
Disaggregated Assessment

Average Grade

<table>
<thead>
<tr>
<th>Category</th>
<th>Average Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Students</td>
<td>2.21</td>
</tr>
<tr>
<td>In-State Residents</td>
<td>2.31</td>
</tr>
<tr>
<td>First-Generation</td>
<td>1.86</td>
</tr>
<tr>
<td>Female</td>
<td>2.15</td>
</tr>
<tr>
<td>Male</td>
<td>2.27</td>
</tr>
<tr>
<td>US Minority</td>
<td>2.02</td>
</tr>
<tr>
<td>International</td>
<td>2.11</td>
</tr>
<tr>
<td>URM</td>
<td>1.83</td>
</tr>
</tbody>
</table>

DFWU Rate

<table>
<thead>
<tr>
<th>Category</th>
<th>DFWU Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Students</td>
<td>36%</td>
</tr>
<tr>
<td>In-State Residents</td>
<td>33%</td>
</tr>
<tr>
<td>First-Generation</td>
<td>37%</td>
</tr>
<tr>
<td>Female</td>
<td>31%</td>
</tr>
<tr>
<td>Male</td>
<td>41%</td>
</tr>
<tr>
<td>US Minority</td>
<td>40%</td>
</tr>
<tr>
<td>International</td>
<td>49%</td>
</tr>
<tr>
<td>URM</td>
<td>43%</td>
</tr>
</tbody>
</table>
What We’ve Learned

- Faculty are the best champions for scaling adaptive learning on campus.
- Build faculty teams with diverse perspectives.
- Organize implementation as a faculty and department driven process.
- Engage faculty with patience and allow flexibility with implementation process.
NOEL WILKIN

PROVOST AND EXECUTIVE VICE PRESIDENT FOR ACADEMIC AFFAIRS,
UNIVERSITY OF MISSISSIPPI
1. Our 5-pronged approach
2. Accomplishments
3. Challenges/ What we have learned
1. Identify and showcase early adopters

Writing instructors, Karen Forgette, Guy Krueger, and Andrew Davis collaborated with peers at Georgia State University, Montclair State University, and the University of Georgia to build out adaptive modules for English Composition in a 2015 APLU grant.

Dr. Kerri Scott, Instructional Assistant Professor of Chemistry, has worked with Pearson since 2012 to develop Mastering for Chemistry.

Julia Bussade, Director of the Basic Spanish Program has worked with Pearson since 2014 to develop adaptive features in MySpanishLab.

All of these faculty had previous relationships with courseware vendors and were familiar with adaptive products.
2. Identify and support new users

Course materials search

Outreach to courseware reps

Capitalize on course materials decisions already made by faculty

Frame courseware as a way to solve problems, not as a top-down initiative.
3. Shift the focus from adaptive learning to active learning

Create a grant oversight program that emphasizes teaching as well as learning.

Collaborate with CETL to provide faculty development programming emphasizing active learning, flipped classroom strategies, and teaching critical thinking skills.
4. Promote the grant program

- Internal and external presentations and PR
- Faculty development programs
- Awards ceremony to show administrative support for faculty-led efforts

PLATO Offers Students Personalized Learning
Program tailors lessons based on individual student needs

MARCH 30, 2017 BY CHRISTINA STEUBE

OXFORD, Miss. – The University of Mississippi’s College of Liberal Arts is implementing a method of personalized learning for students in large courses.

The Personalized Learning and Adaptive Teaching Opportunities Program, or PLATO, uses adaptive and interactive lessons to personally engage students in classes such as biology, chemistry, writing and rhetoric, and mathematics, all of which generally have high enrollment.
5. Execute a research agenda

- Qualitative research on student perception of learning with adaptive courseware

- Quantitative research comparing student grades in classes utilizing adaptive tools and those not utilizing adaptive tools
## Accomplishments thus far

<table>
<thead>
<tr>
<th>Year 1 (June 2016-May 2017)</th>
<th>Year 2 (June 2017 – May 2018)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 Departments</td>
<td>9 Departments</td>
</tr>
<tr>
<td>13 Faculty</td>
<td>55 Faculty</td>
</tr>
<tr>
<td>1 Faculty-built course</td>
<td>3 Faculty-built courses</td>
</tr>
<tr>
<td>&lt;1,000.00 Enrollments in courses using adaptive courseware</td>
<td>&gt;10,000 Enrollments in courses using adaptive courseware</td>
</tr>
<tr>
<td>Qualitative research on student use of adaptive courseware underway.</td>
<td>Quantitative research comparing student outcomes with and without use of adaptive tools.</td>
</tr>
</tbody>
</table>
For More Information

Karen Vignare, Executive Director, Personalized Learning Consortium,
kvignare@aplu.org
240.462.2160
www.aplu.org/plc