SCALING BEST PRACTICES IN FOUNDATIONAL COURSES

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THE PERSONALIZED LEARNING CONSORTIUM AT APLU

WHO WE ARE

The PLC was founded in 2013 to offer participating APLU institutions with opportunities and resources to improve their understanding and implementations of personalized learning using technology. Members cooperate to share experiences and expertise, identify promising and trustworthy vendors and partners, influence data practices, and organize multi-institutional projects that benefit from scale and community.

Every Learner is a diverse network catalyzing postsecondary institutional transformation through the digital learning landscape to improve student success through a comprehensive, collaborative, and coordinated approach.
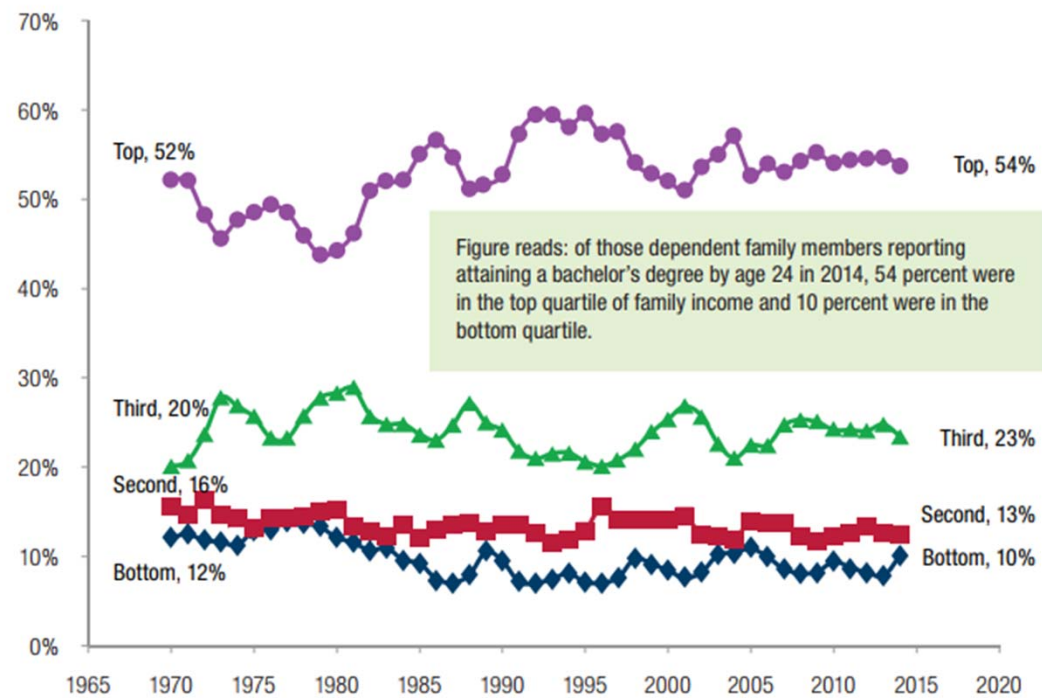
Why we need to Improve Outcomes in Gateway/Barrier/Foundation Courses?

1. Low-income and minority students are lost early in introductory courses

2. Faculty teaching introductory courses are often instructors or GA/TA with little pedagogy training and not long-term employees

3. Departments teaching service courses not incentivized appropriately and struggle with section outcome variability

4. Institutional cultures generally reward innovation of research not teaching

5. Institutional culture values academic freedom over faculty collaboration which leads to student success

Context:

Equity Indicator 5a: Distribution by family income quartile of dependent family members age 18 to 24 who attained a bachelor's degree by age 24: 1970 to 2014

Figure reads: of those dependent family members reporting attaining a bachelor's degree by age 24 in 2014, 54 percent were in the top quartile of family income and 10 percent were in the bottom quartile.

Top, 52%   Top, 54%
Third, 20%   Third, 23%
Second, 16%   Second, 13%
Bottom, 12%   Bottom, 10%

http://www.pellinstitute.org/downloads/publications-
Indicators_of_Higher_Education_Equity_in_the_US_2016_Historical_Trend_Report.pdf

# So how does Adaptive Learning Address Problems?

1. There is large scale evidence that good adaptive implementation is reducing LIMS achievement gaps.
2. We need tools that help all teaching faculty to reduce section variability (and leverage new tools and new pedagogy helps our GAs).
3. The data provides opportunities for faculty to collaborate.
4. Adaptive allows faculty to engage in personalized and active teaching practices
5. Faculty and student satisfaction is high

Understanding what Adaptive Does and does not DO?

- A digital instruction tool that provides personalized learning experience for each student.
  - Analyzes student data and can adapt elements of the instructional content, activities, and assessments based on the student's performance.
  - As a result, students take a customized path through the course material based on he/she is interacting with the software.
- Provides faculty with data about each student's progress and learning needs so that instruction and pedagogy can be modified in real time to improve student success
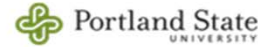
What we are Learning?

- Intentional Focus on reducing gaps and improving outcomes for all is NECESSARY

- Course Redesign is hard and it is critical for faculty to understand it is not just the technology

- Faculty must begin to integrate content, assessments, and activities in courses

- Alignment at the course, department, and college/school is critical

- Staff to support faculty and project management are necessary

- Institutional and Departmental context matters but building a cohort of like institutions that can network is critical

- Leadership must support and allow for time for continuous improvement
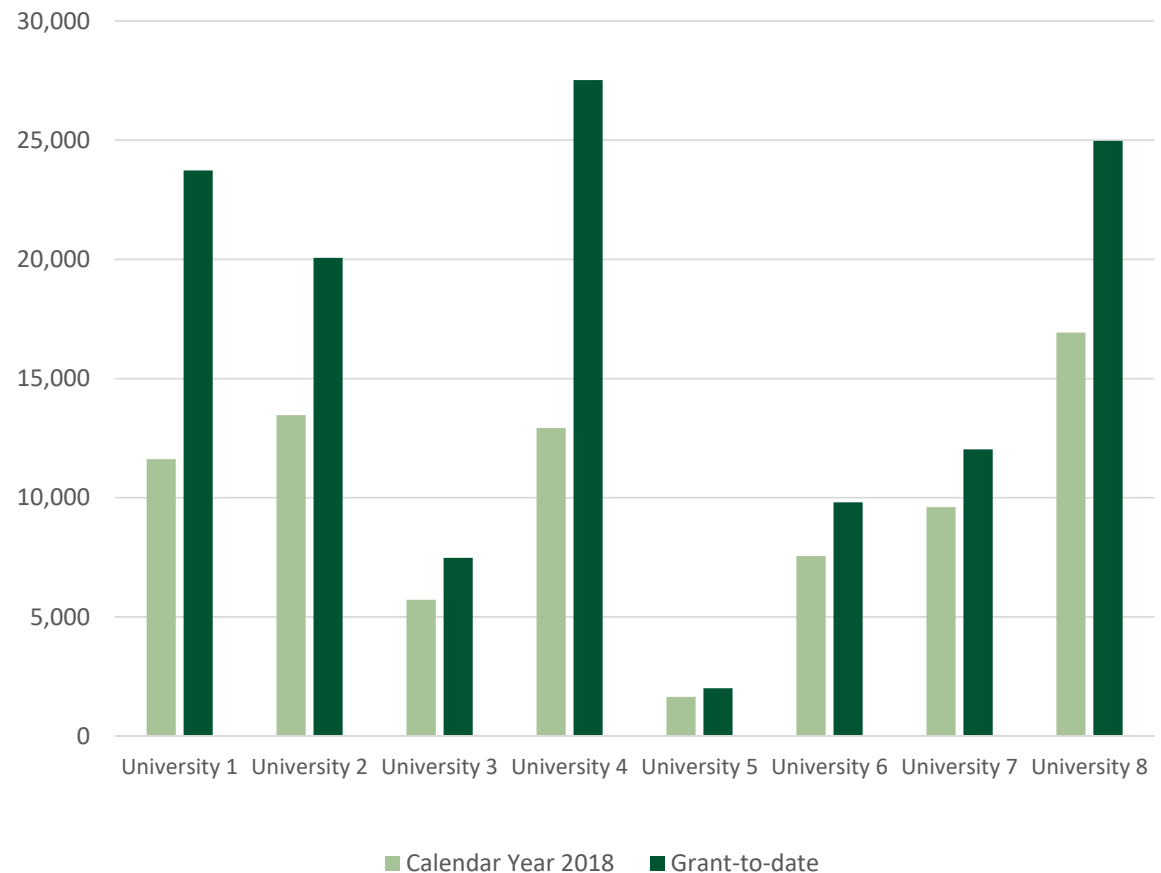
Results:

Grant to date: In two years of work six of eight have scaled to 15% of general education and 100% of sections in some courses (analyzing data report from August)
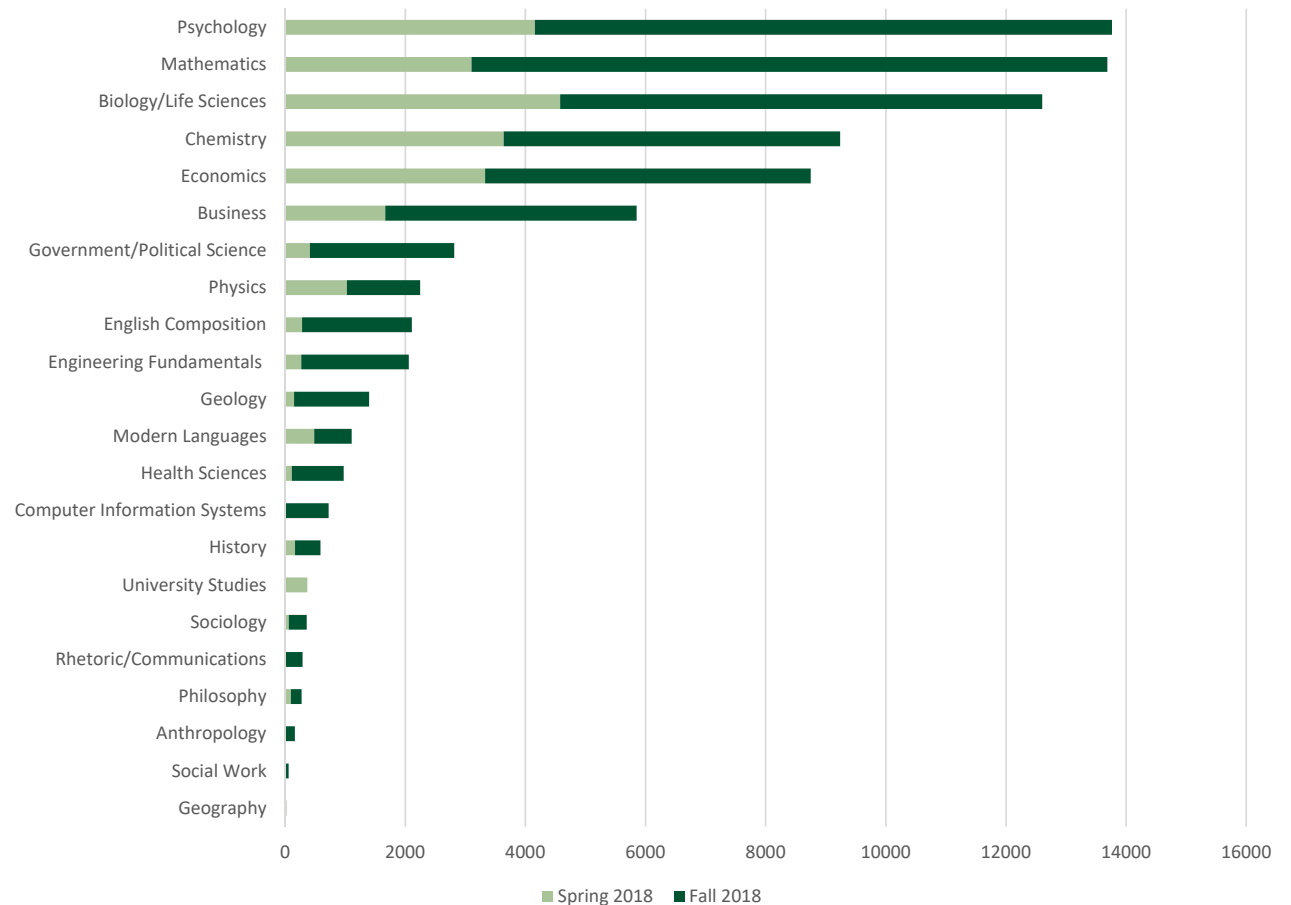
ENROLLMENTS IN COURSES USING ADAPTIVE COURSEWARE TO DATE DEC 2018
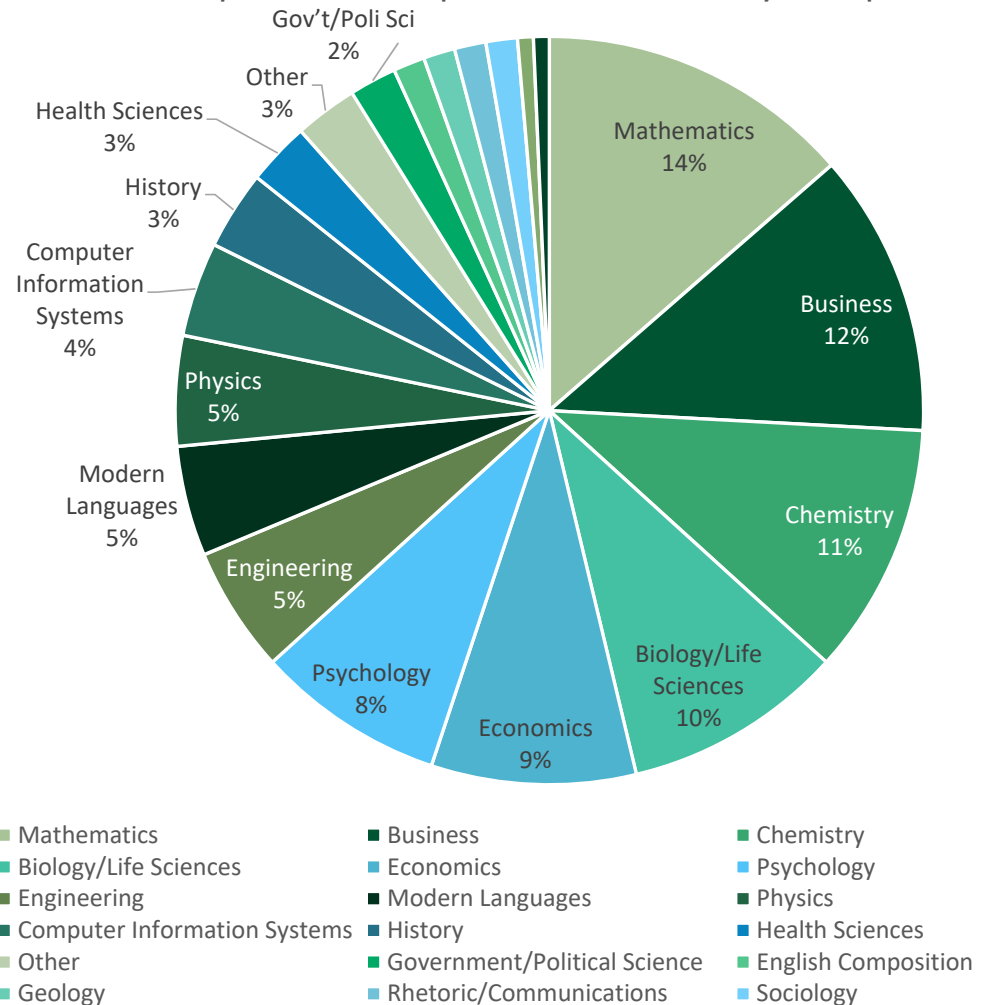
2018 Enrollments by Discipline

Top Five Disciplines: psychology, mathematics biology/life sciences, chemistry and economics

Enrollments by Discipline Spring and Fall Terms 2018

Spring 2018   Fall 2018

Courseware By Discipline:

Over 20 disciplines adopting courseware (52% STEM and 48% Humanities & Social Sciences)

Adoptions of Adaptive Courseware by Discipline

- Mathematics 14%
- Business 12%
- Chemistry 11%
- Biology/Life Sciences 10%
- Economics 9%
- Psychology 8%
- Engineering 5%
- Modern Languages 5%
- Physics 5%
- Computer Information Systems 4%
- History 3%
- Health Sciences 3%
- Other 3%
- Gov't/Poli Sci 2%

Legend:
- Mathematics
- Business
- Chemistry
- Biology/Life Sciences
- Economics
- Psychology
- Engineering
- Modern Languages
- Physics
- Computer Information Systems
- History
- Health Sciences
- Other
- Government/Political Science
- English Composition
- Geology
- Rhetoric/Communications
- Sociology

2019 THE PERSONALIZED LEARNING CONSORTIUM AT APLU

Early Enrollments in Adaptive Were Predominantly in STEM Disciplines; Now Diversifying

Evolution of Adaptive Enrollments by Discipline Group Over Grant Period

Legend: Natural Science, Math, Engineering / Computer, Social Sciences, Business / Economics, Writing / Composition, Other

AY 2016-2017: Natural Science 44%, Math 35%, Engineering/Computer 0%, Social Sciences 7%, Business/Economics 11%, Writing/Composition 0%, Other 3% — STEM 79%

AY 2017-2018: Natural Science 47%, Math 15%, Engineering/Computer 0%, Social Sciences 20%, Business/Economics 8%, Writing/Composition 8%, Other 1%

Fall 2018: Natural Science 31%, Math 19%, Engineering/Computer 5%, Social Sciences 24%, Business/Economics 10%, Writing/Composition 11%, Other 1% — STEM 55%

Note: Preliminary analysis of historical enrollment reports

Most Faculty Use Courseware as Required Homework or Practice

Which of the following best describes how the courseware is used in your course?
(number of respondents selecting each option)

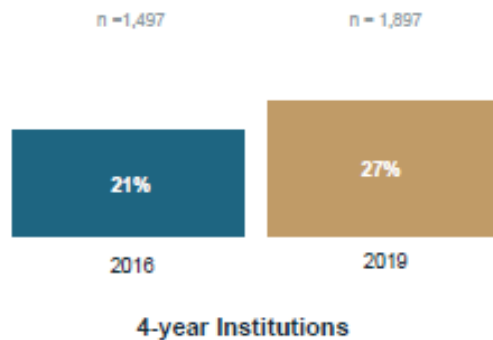|		
As a textbook replacement	38	
As a supplement to a textbook / other instructional materials	35	
As a required homework / practice	80	
As an optional homework / practice	6	
Other (please specify)	13	
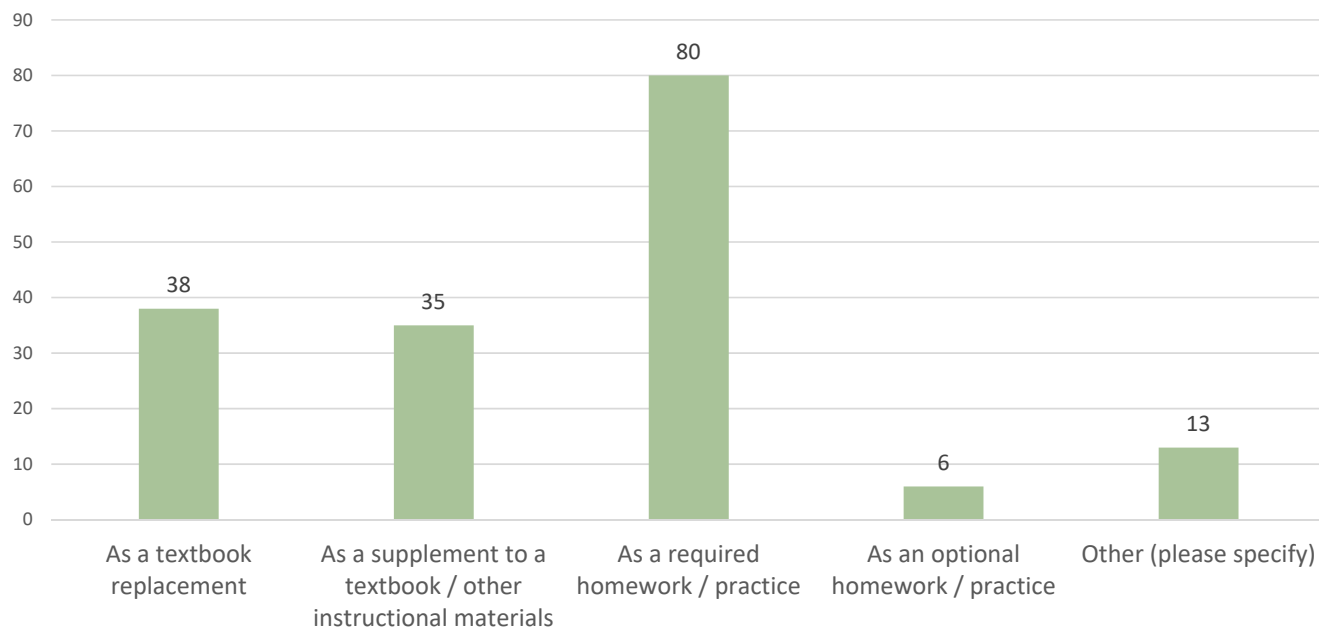
Respondents selecting "Other" said:

- To use the emporium model
- For testing and review
- For a combination of testing, homework, textbook replacement

Note: 95 respondents were given option to select all that apply

Where are we Nationally with Adoption?

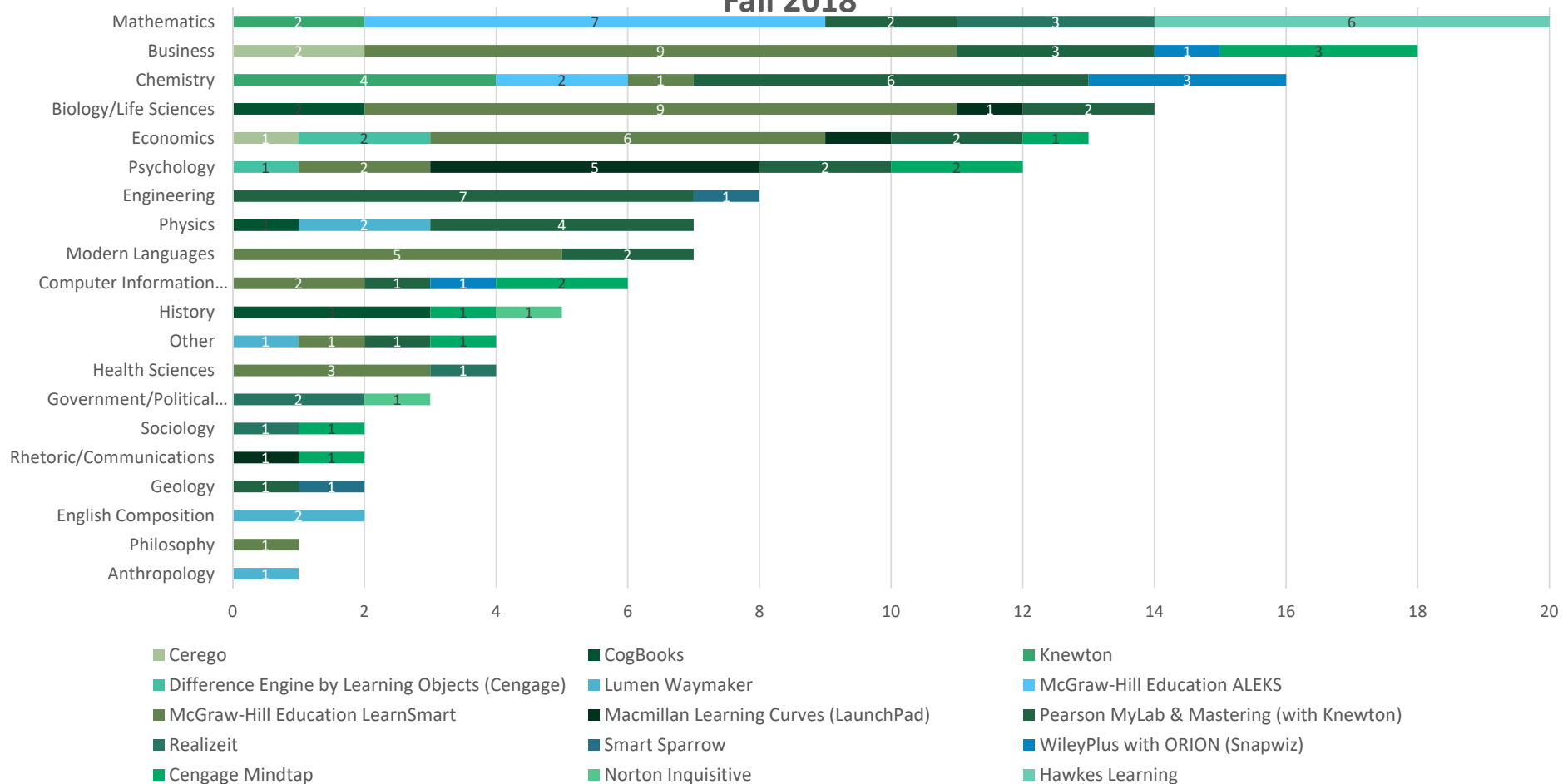Tyton Partners Time for Class

1. Only a third of faculty use tools

n =1,497   n = 1,897

21%	27%
2016	2019

4-year Institutions

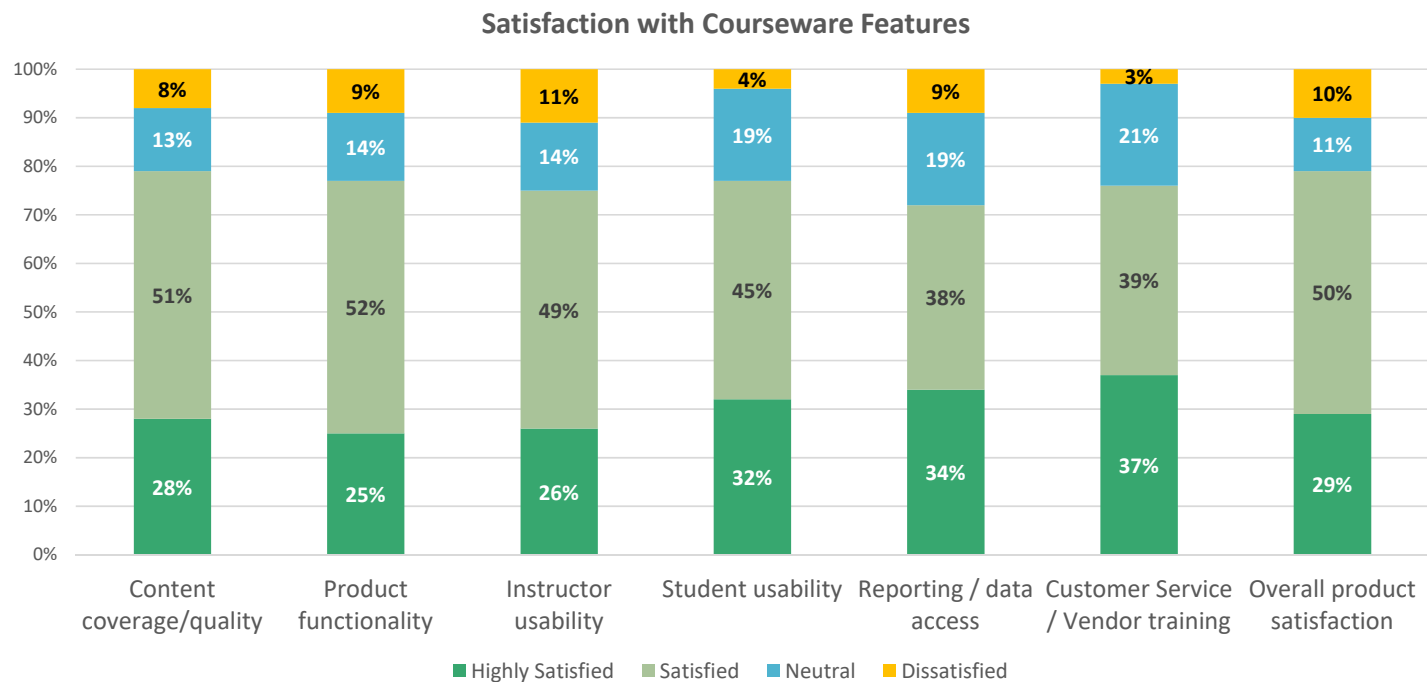Figure 4: Reasons for Adopting Courseware[10]

Faculty-Motivated	Institution-Motivated
• Improve student outcomes (27%) • Part of curriculum or course redesign effort (18%) • Wanted to try a new pedagogy (8%) • Increase use of course-level analytics (5%)	• Courseware was mandated (22%) • Standardize instructional quality (16%) • Change the experience in large classes (4%)

2. But 77% will continue their use

Course Implementations by Discipline and Adaptive Courseware Product
Fall 2018

Discipline	Values
Mathematics	2, 7, 2, 3, 6
Business	2, 9, 3, 1, 3
Chemistry	4, 2, 1, 6, 3
Biology/Life Sciences	2, 9, 1, 2
Economics	1, 2, 6, 2, 1
Psychology	1, 2, 5, 2, 2
Engineering	7, 1
Physics	1, 2, 4
Modern Languages	5, 2
Computer Information...	2, 1, 1, 2
History	1, 1, 1
Other	1, 1, 1, 1
Health Sciences	3, 1
Government/Political...	2, 1
Sociology	1, 1
Rhetoric/Communications	1, 1
Geology	1, 1
English Composition	2
Philosophy	1
Anthropology	1

Legend:
- Cerego
- CogBooks
- Knewton
- Difference Engine by Learning Objects (Cengage)
- Lumen Waymaker
- McGraw-Hill Education ALEKS
- McGraw-Hill Education LearnSmart
- Macmillan Learning Curves (LaunchPad)
- Pearson MyLab & Mastering (with Knewton)
- Realizeit
- Smart Sparrow
- WileyPlus with ORION (Snapwiz)
- Cengage Mindtap
- Norton Inquisitive
- Hawkes Learning

Faculty Report Generally High Courseware Satisfaction

Satisfaction with Courseware Features

	Content coverage/quality	Product functionality	Instructor usability	Student usability	Reporting / data access	Customer Service / Vendor training	Overall product satisfaction
Dissatisfied	8%	9%	11%	4%	9%	3%	10%
Neutral	13%	14%	14%	19%	19%	21%	11%
Satisfied	51%	52%	49%	45%	38%	39%	50%
Highly Satisfied	28%	25%	26%	32%	34%	37%	29%

Legend: ■ Highly Satisfied ■ Satisfied ■ Neutral ■ Dissatisfied

Note: Highly dissatisfied was offered as an additional response option

After Initial Selection, Faculty Tend to Stick with their Courseware

Courseware Product Terms in Use

Frequency

Bar chart showing frequency by terms:
- 1: 14
- 2: 15
- 3: 12
- 4: 12
- 5: 10
- 6: 14
- 7: 4
- 8: 6
- 9: 2
- 10+: 11
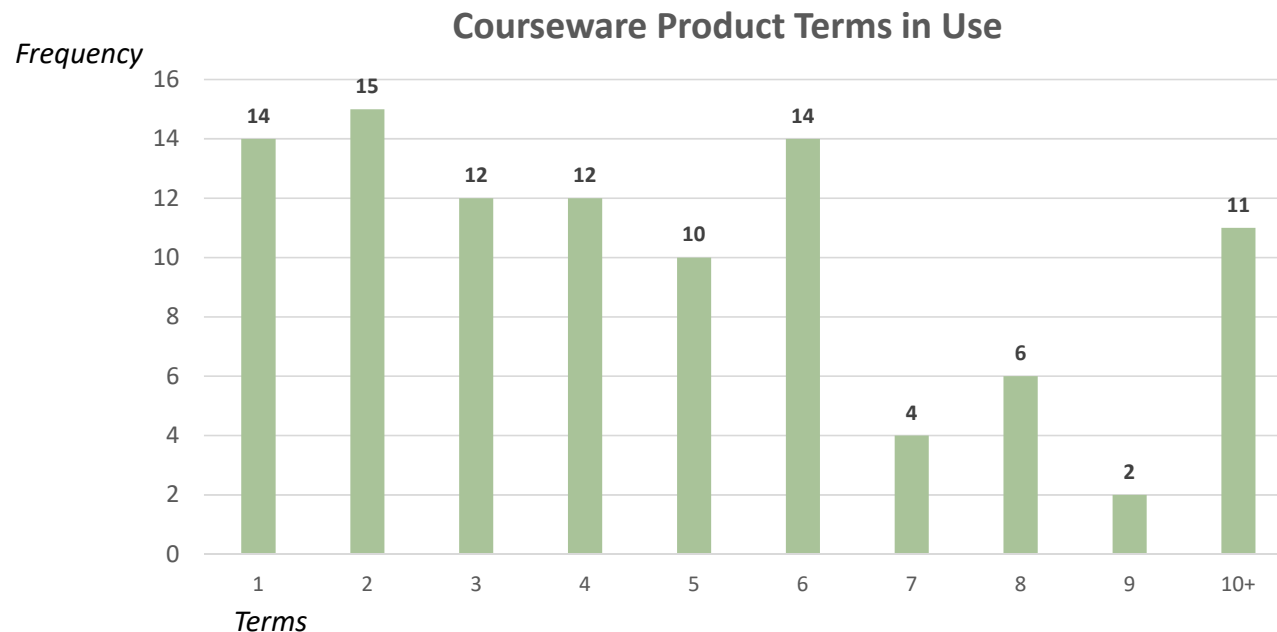
Terms

Questions To Explore:

How are time in use and satisfaction related?

Does the difficulty coming up the learning curve create a high switching cost keeps people from changing products?

Q: How many terms have you been using that product in this course? (including the current term)

Over 1/3 of Survey Respondents Perceive a Reduction in Student Spending on Course Materials Decreased with Courseware Adoption

Courseware Adoption Impacts on Student Course Material Spending

Category	Percentage
The use of courseware decreased total spending on course materials in my course	38%
The use of courseware did not impact total spending on course materials in my course	23%
The use of courseware increased total spending on course materials in my course	22%
I don't know	17%
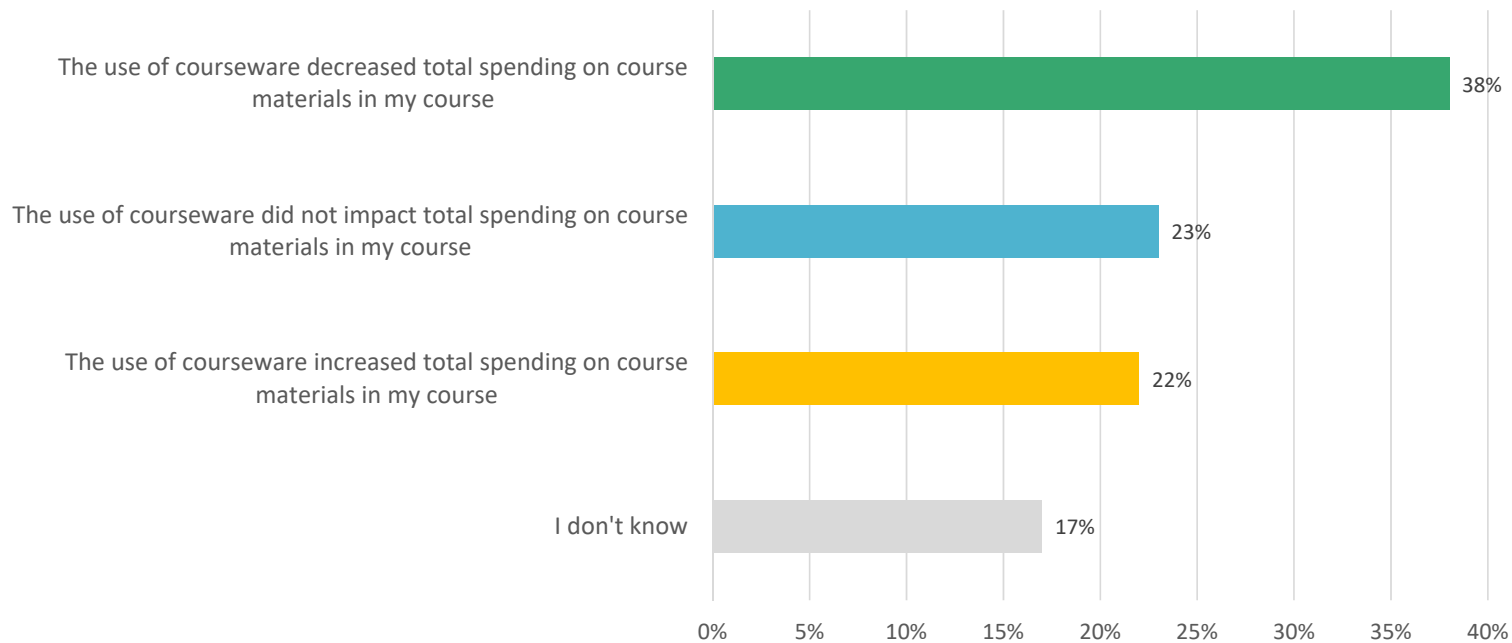
Leveraging Adaptive Courseware Is ..

About **Faculty** having better tools for diagnosis and to deliver better pedagogy during remainder of the course

About **Departments** recognizing that teaching introductory courses should be a faculty team sport

About **Academic IT & IT** that "the best" products do not yet exist and and effort is on supporting scale (moving beyond the pilot)

About **Institutions** recognizing gateway and introductory course improvement is strategic and required to reduce equity gaps

What about Research Impact?

With two academic years of data we are beginning to see trends:

Math, Biology, Business, Physics are stronger performers all showing positive but small effect sizes for year over year use of courseware

Cumulative results have also turned in one academic year to higher student success when comparing both year over year and all remaining sections of non-adaptive

- Next Generation Courseware reports are more positive reporting effect sizes improvements when compared to non-adaptive.

What Institutions Self-Report

OSU is seeing double digit increases in student outcomes for math and psychology, saving students more than $1.3 million from retaking courses

ASU is seeing double digit gains in math student success and strong performance in biology

GSU reports gains in student learning in a few courses

PSU reports higher levels of faculty satisfaction

UM has done 40 student focus groups learning that students are highly aware of whether adaptive courseware supports instruction and remain price sensitive

CSU reports that where adaptive courseware and undergraduate learning assistants are used together student outcomes are even better

NAU reports overall 5% improvement in student success

Every Learner Everywhere: What we do

1 OUR MISSION

Bring together 12 partner organizations to provide a comprehensive, coordinated approach to helping colleges and universities **use new technology to innovate teaching and learning**.

Focus on improving student outcomes of **first-generation college students, low-income students, and students of color**

2 OUR INITIAL FOCUS

Focusing our initial work on helping colleges and universities as they implement **adaptive courseware in first-year, foundational courses**, which have been identified by institutions as vital for student retention and success.

3 WHY THIS FOCUS?

Foundational courses (first-year, introductory, credit-bearing) continue to have low completion rates and present serious barriers to student success.

"Adaptive systems have the radical potential to shift to education in the service of students by providing a student-centric design based on individual student skill and outcome attainment."

– Making Digital Learning Work, 2018-

Objectives

- Scale use of adaptive courseware and redesign in multiple courses

- Focus on improving equity

- Build internal capacity to support foundational course redesigns

- Build a community to support next wave of university and college adoptions

Scope of Project

5 Universities

48 Faculty

6 Disciplines *(Biology, Chemistry, Math, Anatomy & Physiology, Physics, Spanish)*

21 Courses

10 Adaptive Coursewares

14,500 Targeted Enrollments (Fall & Spring)

What have we accomplished so far?

Campus Site Visits (Institutional Needs Assessments; Campus Kick-offs; Faculty Coaching)—14 campus site visits, 2 upcoming

Faculty/Course-Level Implementation Plans
Coursewares Selected for Fall 2019 Implementation

Achieving the Dream Teaching and Learning Summit (May 2019)

Faculty Guild Launch (Fall 2019)—16 faculty, 5 institutions, 6 disciplines (+ATD & AAAC faculty)

Summer Preparation (Courseware Training, Course Design, Curriculum Alignment, Program/Dept Collaboration, Impact Study Design Planning)

Baseline Course Data Requests (Underway)

every learner
everywhere

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UNIVERSITIES

What's coming up?

Spring 2020: All institutions implementing courseware in target courses

Webinar Series: Faculty & Administrative (Fall 2019-Spring 2020)

Faculty Guild Continues (Spring 2020)

Developmental Workshops and Communities of Practice (Spring 2020)

Visits to Host/Mentor Campuses (Spring 2020)

Disciplinary and Regional Convenings (APLU & ATD)

Texas Regional Convening on Adaptive

September 27 @ Houston Community College

Preliminary Evaluation and Plans for Improvement (Late Fall)

Winter (Dec/Jan reporting requests)

ATLANTA
November 6-9

CCAS 2019 ANNUAL MEETING

Scaling Best Practices in Foundational Courses with Adaptive Learning

Robert Cummings
Executive Director of Academic Innovation

Patti O' Sullivan

Personalized Learning & Adaptive Teaching Opportunities Program Manager

University of Mississippi

The University of Mississippi: Quick Facts

23,780 current enrollment

56% of students are Mississippians

31% of students are minorities

30% of students are Pell-eligible

40% increase in enrollment 2006-2016

13% increase in enrollment 2011-2016

85% retention rate for the 2017 cohort

60% graduation rate within 6 years

Our approach to adaptive learning in year 4 of the APLU Adaptive Courseware grant

1. Faculty mentoring

2. Research

3. Presentations and publications

How can chairs and deans support faculty?

1. Encourage them to engage in **collaborative course redesign** based on backwards design and evidence-based teaching and learning practices.

2. Establish with faculty some **goals for student outcomes** in pre-requisite and general education courses.

3. Incentivize faculty to engage in **SoTL research** and to present their findings.

Collaborative Course Redesign

1. Collaboration ideally takes place among instructors teaching **the same course.**
2. Collaboration can work **across courses –** particularly those in sequence.
3. Courses should **demonstrate the link** between course learning objectives and program learning objectives.
4. Course redesign can benefit from the inclusion of an **instructional designer or learning specialist.**
5. Consider **cost and value** when choosing course materials.

Goals for student outcomes

- What is the **philosophy of student success** driving course design? Bell curve, gatekeeper, equity?
- What are the **DFW rates** for each course?
- What are the **academic consequences** for failure in departmental courses?
- Do specific demographics of students disproportionately benefit from courses or are **disproportionately disadvantaged** by these courses?
- Are there strategies for improving student **success without compromising** the rigor of courses?

Scholarship of Teaching and Learning

- Who in your department studies **education in your discipline?**
- Establish a **culture of researching teaching and learning** in your department's disciplines.
- Provide **support for faculty** engaged in SoTL.
- Tie new initiatives such as adaptive courseware implementation, to SoTL and to other **departmental goals.**
- Institute a live event or digital platform for faculty to **share SoTL research.**

What UM has accomplished with the APLU grant

| Year 1 (June 2016-May 2017)	Year 2 (June 2017 – May 2018)	Year 3 (June 2018 – May 2019)
4 Departments	9 Departments	13 Departments
12 Faculty	54 Faculty	82 Faculty
29 Sections	253 Sections	420 Sections
2,057 Enrollments in courses using adaptive courseware	11,828 Enrollments in courses using adaptive courseware	18,746 Enrollments in courses using adaptive courseware
	Qualitative research on student use of adaptive courseware underway	Ongoing faculty research and 6 faculty conference presentations

Challenges

- **Multiple vendors creates confusion regarding what courseware features are adaptive and how adaptive should be integrated into each course.**

- **Faculty autonomy, multiple instructors, and graduate student instructors makes course coordination difficult in some departments.**

- **Changing faculty attitudes from that of gatekeepers and sage on the stage to facilitators of learning.**

- **Limited resources make it difficult to provide extensive faculty onboarding and faculty development.**

From the Chair's Perspective

- New department, created as center in 2009, advanced to department in 2014
- Blank slate afforded us opportunity to create a departmental culture focused on teaching and learning
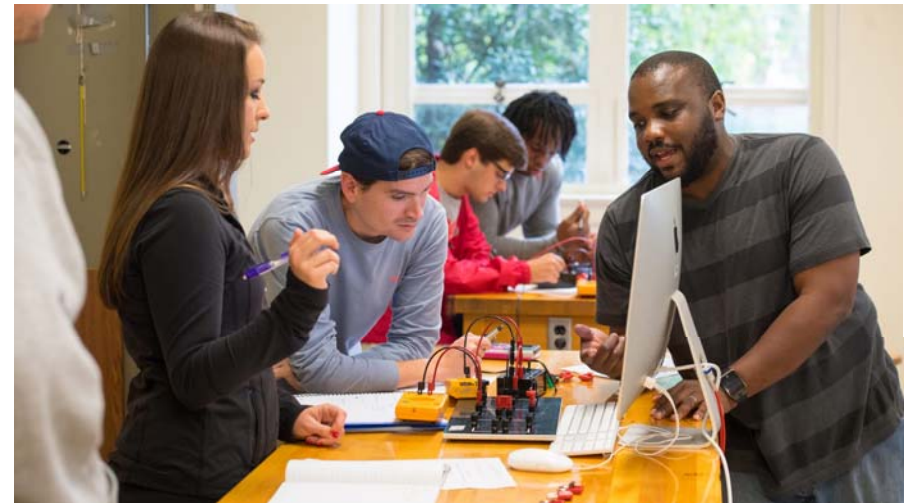
From the Chair's Perspective

- Flattened hierarchy: most all faculty were full-time non-tenure-track instructors
- Course curricula were controlled by committees of those instructors
- Assessments of course effectiveness were implemented by those faculty

From the Chair's Perspective

- We created a culture of Innovation (before it was a buzzword)
- Faculty were encouraged to experiment with their curricula and approaches. These included ePortfolios (later commonplace books), Open Educational Resources, Teaching with Wikipedia, gamification, two national cohort projects, and at least one failed software venture.

From the Chair's Perspective

- Challenges included managing faculty culture
  - Non-participants could feel left out.
  - Participants could burn out.
  - Assessment could be difficult to achieve with multiple changes to baselines.
- Alternatively, successes demonstrated support for thinking about how to improve teaching and learning.
- Faculty knew that administration encouraged risks, and were willing to support them if teaching evals dropped.

What's next?

- Reduce the cost of access codes and textbooks through increased **OER** adoption and negotiation with vendors

- Increase involvement of faculty in discipline-specific **learning communities**

- **Faculty mentoring** other faculty at institutions involved in the Adaptive Courseware for Early Success grant.

DON'T START FROM SCRATCH…

https://www.everylearnereverywhere.org/toolkit-download
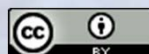
QUESTIONS?

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