Adaptive Learning:
Two Perspectives and Approaches

IMS Global LILi
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What do we mean by adaptive courseware?

Deliver the –

Right lesson
Right student
Right time
From Adaptive to Adaptable: The Next Generation for Personalized Learning

This paper comprises several sequential articles contributed by participants in the IMS Global Learning Consortium Adaptive Learning Innovation Leadership Network.

We would like to thank the following individuals who lent their personal expertise to develop this resource, which is meant to inform and help facilitate conversations on adaptive learning. The hope is that its high-level approach will support institutional leaders and other stakeholders as they advance their practices and continue to evolve adaptive learning in higher education.

Melissa Edwards, Purdue University
Cristi Ford, University of Maryland, University College
John Fritz, University of Maryland, Baltimore County

Dale Johnson, Arizona State University
Lou Pugliese, Arizona State University
Samantha Birk, IMS Global Learning Consortium
Adaptive Learning Ecosystem

Decision Tree
Rules Based
Machine Learning
Advanced Algorithm
ASU Adaptive Experience

Cengage Learning Objects – psychology, economics

Cerego – astronomy

CogBooks – biology and US history

Khan Academy – remedial math

Knewton – remedial math

McGraw Hill ALEKS - college algebra

McGraw Hill LearnSmart Master - remedial math

McGraw Hill LearnSmart Connect - chemistry

Pearson MyMathLab with Knewton – college math

Pearson Mastering with Knewton - physics

SmartSparrow – science courses
Why do we need adaptive courseware?

ASU Math course
August to December
Lessons completed by each student
What have we tried?

- Best results with “Adaptive and Active” approach

Active Learning in class

Adaptive Learning before class

Bloom’s Taxonomy
How does this approach work in practice?

1. **ACQUIRE INFO**
   Read textbook, watch video, do simulation, etc.

2. **ANALYZE**
   Do practice problems, take quiz before class

3. **APPLY**
   Solve an applied problem (case study) with classmates.

4. **ASSIMILATE**
   Write essay, solve problems, take quiz, etc.

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ADAPTIVE SYSTEM

- Prepare
- Prove

ACTIVE CLASS

- Prove
- Participate
How have adaptive systems worked at ASU?

Introduction to Biology (~ 850 non majors)

Same instructor, curriculum and assessment

![Adaptive + Active Initiative graph]

- Spring 2014 (lecture): Withdrawal Rate 11, Grade of C or better 77
- Fall 2014 (lecture): Withdrawal Rate 10, Grade of C or better 80
- Spring 2015 (active): Withdrawal Rate 20, Grade of C or better 72
- Fall 2015: Withdrawal Rate 1.5, Grade of C or better 94
- Spring 2016: Withdrawal Rate 7, Grade of C or better 91
- Fall 2016: Withdrawal Rate 5, Grade of C or better 91

Legend:
- Orange: Withdrawal Rate
- Green: Grade of C or better
How have adaptive systems worked at ASU?

College Algebra (~ 5000 students)

Same instructors, curriculum and assessment

One Year Pass Rate for Fall College Algebra Track Students

- 2014-15: 55.0%
- 2015-16: 62.4%
- 2016-17: 79.2%

Legend:
- Green: All Students
- Maroon: Math placement below 117
- Yellow: Math placement into or above 117
Moving the Heart and Head: Implications for Learning Analytics Research

by John Fritz and John Whitmer  Monday, July 17, 2017  Editors' Pick
Key Faculty Paradigms

How Teaching Evolves

Focused primarily on . . .

1. Their role as teachers
2. The role of learners
3. Shared role/community


Motives to Use Technology

Consisting primarily of . . .

1. Evidence of student impact
2. Release time to design
3. Confidence IT will work

Using Analytics at UMBC: Encouraging Student Responsibility and Identifying Effective Course Designs

Tuesday, April 30, 2013 | Briefs, Case Studies, Papers, Reports

Author(s): John Fritz

Sources(s): EDUCAUSE Center for Analysis and Research (ECAR)
Collection(s): Research Bulletins

Analytics, Student Success, Teaching and Learning, Assessment and Evaluation, Instructional Design, Instructional Technologies, Learning Analytics, Learning Management Systems (LMS)
Tim Hardy & ECON 122

Avg. Bb Hits Per Student

1st Overall
1st Undergrad

Attends hybrid course design workshop
Adaptive Release Panel

http://my.umbc.edu/groups/fdc/events/14040
Faculty Innovation with Adaptive Release

Implementing Game-Based Learning Elements in Blackboard
Novel Use of "Adaptive Release" Influences Student Behavior

http://my.umbc.edu/groups/fdc/media/4766
# Faculty AR Use vs. Student Course Access

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Closing Thoughts

Nobody learns from a position of comfort.

A good farmer first puts salt in the horse’s oats.
THANKS & QUESTIONS?

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