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# Case Study

University of  
Louisville (UofL)

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# About the Contributors

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# About the Supporting Organizations



**Every Learner Everywhere** is a network of twelve partner organizations with expertise in evaluating, implementing, scaling, and measuring the efficacy of education technologies, curriculum and course design strategies, teaching practices, and support services that personalize instruction for students in blended and online learning environments. Our mission is to help institutions use new technology to innovate teaching and learning, with the ultimate goal of improving learning outcomes for Black, Latinx, and Indigenous students, poverty-affected students, and first-generation students. Our collaborative work aims to advance equity in higher education centers on the transformation of postsecondary teaching and learning. We build capacity in colleges and universities to improve student outcomes with digital learning through direct technical assistance, timely resources and toolkits, and ongoing analysis of institution practices and market trends. For more information about Every Learner Everywhere and its collaborative approach to equitize higher education through digital learning, visit [www.everylearnereverywhere.org](http://www.everylearnereverywhere.org).



**Association of Public and Land-grant Universities (APLU)** is a research, policy, and advocacy organization dedicated to strengthening and advancing the work of public universities in the U.S., Canada, and Mexico. With a membership of 244 public research universities, land-grant institutions, state university systems, and affiliated organizations, APLU's agenda is built on the three pillars of increasing degree completion and academic success, advancing scientific research, and expanding engagement. Annually, member campuses enroll 5 million undergraduates and 1.3 million graduate students, award 1.3 million degrees, employ 1.3 million faculty and staff, and conduct \$49.2 billion in university-based research.

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# Introduction

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UofL's Delphi Center for Teaching and Learning formed the Adaptive Learning Leadership Initiative (ALLI) to administer the APLU grant. The Delphi Center provides programming and other resources to faculty members who encourage excellence in teaching and foster student learning.

ALLI supports UofL's 21st Century University Initiative by seeking to improve student retention through the adoption of adaptive courseware in large-enrollment general education courses. This kind of thinking is especially important today as online education modalities surge and increasingly become more widespread due to the COVID-19 pandemic.

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# University of Louisville (UofL)

- This case study from the University of Louisville demonstrates their approach to leveraging adaptive courseware to improve course design and how they've provided development and support to faculty throughout the process.
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## Key Takeaways

- More success has been realized with scaling efforts when focused on course design and introducing adaptive courseware as a tool.  
Master syllabus
  - Course purpose
  - Learning outcomes
  - Assessment philosophy, if not specific assessments content, although not necessarily identical readings and learning materials.
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### About the School and Grant

The University of Louisville (UofL) is a public research university located in Kentucky's largest metropolitan area. The university enrolls 21,430 students. Underrepresented minorities make up 19.47% of the student body, 32.6% are Pell-eligible, and 20.8% are first-generation students.

UofL was awarded the Accelerating Adoption of Adaptive Courseware Grant in 2016 to scale the use of adaptive and other innovative technologies in order to improve student success in general education courses. The grant is administered by the Personalized Learning Consortium at the Association of Public and Land-grant Universities (APLU) and is generously funded by the Bill & Melinda Gates Foundation.

**Adaptive courseware technologies are powerful but must be coupled with other critical course pedagogical changes.**

Substantial faculty training in how to effectively utilize adaptive analytics data from student assessment outcomes is required, and faculty must also learn active learning pedagogy. Both approaches are crucial for achieving improved student pass rates.

Adaptive courseware can provide keen insights into student learning regardless of where that learning takes place. Online, blended, and face-to-face teaching and learning environments can all be enhanced through the adoption and implementation of adaptive technologies.

**The overriding goal is to meet and engage with student learning where they are.**



### Goal

UofL sought to accelerate and scale the university's adoption of adaptive courseware across multiple disciplines. It began its participation in the APLU grant with a goal of scaling adaptive courseware in multiple sections of 14 high enrollment courses, reaching more than 8,300 enrollments, which is 15% of all general education enrollments.

### Approach

During the early phases of development in 2016, ALLI's implementation team coordinated with the university's Institutional Research Department to provide DFW (Drop-Fail-Withdrawal) rates for six previous semesters in core curriculum courses, targeting those courses that had a DFW rate of 18% or higher. From there, the team narrowed down the number of pilot courses to be included in the APLU grant. Other faculty members and departments became interested in adaptive learning as well.

The ALLI implementation team also compiled a list of faculty members who had experience with instructional technologies by asking learning management system administrators, technical support staff, instructional designers, program directors, and vendor salespeople to list faculty members who were familiar with using adaptive courseware products. A second list of faculty members who regularly participated in programming-level enterprises was put together by the Delphi Center for Teaching and Learning. The two lists were then cross-referenced to identify the most experienced and willing faculty members and the courses they taught. Those courses identified as best positioned for success and scale were chosen for the pilot.

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ALLI also launched an Adaptive Learning Faculty Learning Community comprised of the aforementioned faculty champions. Their goal has been to spearhead faculty engagement.

UofL also leveraged the Course Design Institute (CDI), which is a three-day program that gives faculty the opportunity to transform or (re)design their courses with a student-centered focus to include adaptive and active learning.

The following six courses have scaled adaptive courseware and are expected to be sustainable:

Course	Adaptive Courseware Provider
Business Statistics	Pearson MyLab   Mastering and Knewton
College Math Non-STEM	Hawkes Learning
College Math STEM	Hawkes Learning
College Algebra	ALEKS
Fundamentals of Physics 1 & 2	Lumen Waymaker
Introduction to Mech, Heat & Sound 1 & 2	Lumen Waymaker

## Relevant Findings

UofL has implemented adaptive courseware across 51 courses in the natural sciences, social sciences, economics, and math since the APLU grant started in 2016, growing from 20 sections in Fall 2016 to 154 sections in Fall 2019, all together reaching 26,655 enrollments to date.

In Business Statistics, faculty members concluded that adaptive courseware is more effective than paper homework assignments.

The two College Math courses have seen an impressive 20% drop in DFW rates. Success has been achieved through a combination of adaptive learning and the Emporium Model, in which classes are held in a computer lab and students are encouraged to learn at their own pace while being able to receive individualized instruction as needed. Students can display color-coded flags to request help from a TA as graduate and undergraduate students walk around the lab answering questions. A Math Resource Center has been added for personalized tutoring and to work on adaptive assignments outside of class time.

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After seeing how ALEKS was successfully implemented at other grantee institutions, UofL adopted ALEKS in its College Algebra course.

Fundamentals of Physics 1 & 2 and Introduction to Mechanical, Heat & Sound 1 & 2 have seen as much as a 16% reduction in DFW rates. The Physics Department is interested in building additional courses using an adaptive learning platform.

The use of a graduate assistant played a key role in developing and supporting the logistics of the Course Design Institute, aggregating and summarizing data and feedback, reviewing syllabi to identify potential faculty partners, organizing notes from meetings, facilitating student focus group in the fall, and gathering student feedback. Overall, a total of six graduate students were hired to help faculty with course development issues, and 25 undergraduate students were hired to provide classroom assistance activities. Some faculty members were given stipends to work over the summer semesters to develop course content.

Relationships with program managers from other universities participating in the APLU grant have also been very helpful. Program managers have frequently reached out to one another to ask how similar situations were handled or to connect faculty in the same disciplines. Meetings with program managers (both face-to-face and online) have helped with streamlining processes, solving issues quickly, and sharing resources. Each month the program managers have sought guidance with issues, such as vendor policies or concerns raised by faculty, which helped UofL find solutions to resistance or to prevent similar problems from arising.

The APLU grant has revolutionized some of the thinking we are doing and how we are moving forward. It has really helped us start a conversation, and I believe, not just about adaptive courseware, but we have also started a climate change on campus to think more about teaching.

– Ryan Luke, UofL Program Manager

## Course Challenges and Obstacles

While much success is evident at UofL, some courses have not scaled as planned. Progress stalled in the Biology Department where adaptive courseware was implemented in Spring 2019. Scaling to 100% was not reached because of last-minute hiring and instructor changes. Additionally, issues arose at the end of the semester with Blackboard integration. If students did not connect to the platform through the Blackboard link, then the synchronization of grades did not stay up to date. The Delphi Center professional staff have been working to resolve the issue.



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Courseware is not always applied consistently across sections in all courses. In large enrollment and multi-section courses, a significant cultural change is needed in order to get each faculty member to coordinate like-minded decisions regarding textbooks, content, materials, courseware, activities, assessment, and grades. Nonetheless, UofL has effectively leveraged the grant to bring instructors of the same courses together to discuss course content and alignment of learning objectives.

### What do Students Think?

Two student focus groups were conducted, one in Fall 2018 (twelve students) and one in Spring 2019 (five students). These students experienced adaptive courseware in the following courses: College Algebra, Pre-Calculus, Pre-Algebra, Quantitative Reasoning, Physics for STEM Majors, Physics for Non-STEM majors, Introductory Biology, and Psychology.

All 17 students indicated they would recommend their professor continue to use the courseware, noting that it was worth the investment of time from the instructor and worth the investment of money from the student. Approximately 65% of students commented that the courseware contributed to their success.

Students expressed that specific feedback about why they may have answered a question incorrectly and how to correctly answer the question is an important and necessary component of the software.

Students also expressed that they do not complete work in adaptive courseware if it is not a significant part of their grade.

### Five Key Findings:

Through its participation in the grant, UofL learned the following valuable lessons that might help other universities in the future:

- **Building customized courses requires significant faculty time.**  
The amount of work in building a fully customized project required more time than anticipated.
- **Successful implementation should be celebrated and data shared.**  
The Emporium Model in Developmental Algebra has seen gains of 24% using adaptive courseware. This success was shared with other departments to introduce potential outcome improvements institution-wide.
- **Leverage adaptive to improve course design.**  
More success has been realized with scaling efforts when focused on course design and introducing adaptive courseware as a tool.
- **Make it count toward student grades.**  
Students are very clear that adaptive courseware must count for a significant portion of their grade in order for them to use it. They are willing to pay for and use adaptive courseware provided that it is aligned with material they will be tested on.

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- **Faculty culture must shift from individual to team.**

Because faculty are free to choose how adaptive courseware is implemented and how it impacts students grades, measuring overall impact of courseware is still challenging. This was cited as the number-one challenge for successfully implementing adaptive environments.

## Future Directions

Like other institutions, UofL faces future obstacles. If faculty members continue to choose resources for their courses at their discretion, then there is risk that less effective courseware will be purchased. Future adaptive courseware implementations could be driven by publishers and vendors in an uncoordinated and decentralized fashion.

UofL recognizes that the grant's success is not easily carried forward without additional funding. Some of that funding would be used to collect and report more detailed data on the use and efficacy of adaptive courseware. Another need is that a project lead is required for continuing and expanding projects in mathematics, physics, and anthropology. The implementation team has been seeking to understand and replicate the most effective use of adaptive courseware and is seeking to deepen its partnership with APLU.