

Return on Investment Overview

What Is Return on Investment and How Should Postsecondary Institutions Be Using It?

Higher education institutions are navigating increasingly complex technological and operating environments, with a diverse range of potential strategies to follow and initiatives to invest in. With limited resources, institutional leaders are challenged to identify the opportunities that will help their institution most effectively achieve its goals.

Deciding which projects to pursue can be daunting. Higher education institutions are expected to use data to make evidence-based decisions, and yet the evidence that leaders seek is lacking. This is both because the impacts of a new initiative can take years to be realized and because results depend on institutional context, making it nearly impossible to be confident that the impacts of an initiative at one institution can be replicated at another institution.

Furthermore, comparing different projects is difficult because the inputs and outputs of those projects vary. For example, the resources devoted to a project may include dollar expenditures, which are relatively easy to measure, and people and process changes, which have direct and indirect costs that can be much harder to quantify. At the same time, the returns from initiatives may include a combination of financial and social outcomes, making them challenging to measure and compare.

To help inform the decision-making process, institutional leaders are looking to analyses and frameworks that have proved useful in other sectors. One of these is return on investment. ROI analysis comes from the financial investing world and is used to evaluate the efficiency of an investment or to compare investment results with financial return goals. By measuring the return relative to the cost of an investment, users can assess whether their investment will generate a positive overall return (indicated by a positive ROI) and can compare investments of different sizes and varieties based on their return. ROI is calculated by dividing the net return of an investment by its cost:

$$\frac{\text{Return} - \text{Investment}}{\text{Investment}} = \text{ROI}$$

The inputs to this equation—the costs and returns from the investment—are easy to calculate when looking at an investment with costs and benefits that are in strictly dollar terms. The result of this calculation can be expressed as a percentage by multiplying by 100.

ROI is a popular metric in financial analysis because of its versatility and its relative simplicity. For example, take a share that cost \$100 to purchase and is selling for \$120 today, with a \$5 redemption fee. The inputs

to the equation are the return from the investment (selling price of \$120 minus \$5 redemption fee) and the cost of the investment (purchase price of \$100). The ROI calculation would be:

$$\frac{(\$120 - \$5) - \$100}{\$100} = 15\% \text{ ROI}$$

Seems pretty simple, right? Unfortunately, in higher education and other sectors with public and nonprofit missions, application of ROI analysis is often much more complicated than the example above, for a handful of reasons:

1. **Higher education institutions invest in projects or initiatives that have multiple costs and returns.** A given investment opportunity may include technology costs, service costs, allocation of human resources from across departments and more. In this brief, “project cost” encompasses all the costs of the investment.
2. **It is difficult to isolate and measure the gains and costs of individual projects.** At any time, an institution is likely working on several potentially overlapping projects in support of its goals.
3. **Higher education institutions serve many stakeholders.** A financial investment is generally pursued with the goal of achieving a minimum level of profit for the investor. Many higher education institutions have missions that include serving learners, employers and communities more broadly. As a result, the projects they undertake likely have multiple goals and measures of success.
4. **The costs and benefits of an institutional initiative are not strictly dollar based.** For example, improving student grades in first-year courses can be considered a benefit or gain for an institution, even if this outcome doesn't directly produce (or even indirectly produce) additional institutional income.
5. **Many of the benefits of an institutional project can take years to be realized.** Take the example above—improving student grades in first-year courses. The downstream effects of improving student grades in those courses may include higher retention rates in two years, better job placement rates and opportunities in four years, and higher levels of graduate income in 15 years.

Despite the challenge of applying ROI in a higher education context, ROI analysis has potential benefits for institutions that can incorporate their mission and goals into the ROI calculation.

ROI in Higher Education Should Account for *Value*, not just *Dollars*

Many postsecondary institutions invest in new initiatives to help achieve their mission or strategic goals related to growth, student demographics and student outcomes. Changes in these areas should be captured in an accounting of gains and losses, even if they don't produce direct financial impacts, to help an institution assess whether the investment is “worth it” or to compare the effectiveness of one initiative versus another.

The value attributed to social outcomes achieved by a particular initiative depends on the institution. The institution's mission, strategic goals and culture all play a part in determining that value. For example, an institution that has set a goal to improve student completion by 10% should attribute value to a project outcome of improved graduation rates.

Inputs for Evaluating ROI in Higher Education

To account for the value of social outcomes in an ROI calculation, an institution should begin by considering its goals or intended outcomes for an initiative. In many cases, these goals will fit into the following categories:

- **Student access:** Expanding what the institution does by serving more students and helping current students earn the credits that they need at the right time. Progress in this category may be measured in metrics like the number of enrollments, student credit hours, and the number and types of students served.
- **Student outcomes:** Improving what the institution does in regard to educating students and helping them achieve their goals. Progress toward goals in this category may be measured in metrics like graduation and student retention rates, student grades and student satisfaction.
- **Economics:** Growing revenue at the institution or reducing costs to the institution or to learners. Progress toward goals here is likely measured in dollars.

Measuring the ROI for a project with solely financial goals and outcomes—results fitting into the third category above—can be relatively straightforward. But if an institution has set goals related to student achievement, student access or other nonfinancial results, those outcomes should be incorporated into the return portion of the ROI equation. This makes the ROI analysis more complicated and subjective.

$$\frac{\text{RETURN} \\ \$ + \text{Social Outcomes} - \text{Project Cost } \$}{\text{Project Cost } \$} = \text{ROI}$$

In this case, whether the ROI is positive depends on the value that the institution attributes to the social outcomes resulting from the project.

EXAMPLE INVESTMENT SCENARIO

ABC State University has a goal of improving first-year student retention from 75% to 78% over the next three years. Current enrollment is 15,000, including 4,000 entering freshmen each year. To reach 78% retention, the Institutional Research team assumes it needs a 10% improvement in general-education course passing rates.

ABC State determines that it will need to invest in course improvement for ten courses to achieve this goal. The investment during this three-year period will include hiring two new staff members at a cost of \$200,000 per year, plus \$150,000 in course improvement costs like course redesign and faculty development, for a total **project cost of \$750,000**. Increased first-year student retention will generate **\$1,200,000** in additional tuition from students who otherwise would have dropped out. At the same time, due to higher passing rates, tuition of **\$500,000** will be lost over the project term. The incremental cost of serving retained students will be **\$400,000**, consisting primarily of instructional and administrative expenses. Combined, the increases in revenue and costs produce a financial **return of \$300,000**.

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So is the course improvement project “worth it” to ABC State University? To start answering that question, the university could use ROI analysis. The ROI equation for this project would look like this:

$$\frac{\text{RETURN}}{\$300,000 + +3\% \text{ Retention} - \$750,000} = \text{ROI}$$

$$\frac{\$750,000}{\$750,000}$$

Without attributing value to the change in student retention, this project would appear to generate a negative ROI for the institution (-60%). However, the analysis does not yet account for the social outcomes of the project, like achieving the institution’s goal for improved first-year retention.

To account for social outcomes, ABC State University should consider this simplified ROI calculation:

$$\frac{\text{Value of +3\% Retention} + -\$450,000 \text{ (net return)}}{\$750,000} = \text{ROI}$$

If ABC State University attributes value of more than \$450,000 to the outcome of improving first-year student retention by 3%, then this three-year project would generate a positive ROI for the institution. The value attributed to the improvement in retention, and therefore the determination of whether the project is “worth it” for the institution, must be decided by institutional leadership.

The ROI analysis in this scenario offers a framework for aggregating the costs and benefits of the project and determining the minimum value that an institution would need to place on a desired social outcome in order for a project to generate a positive ROI for the institution. It does not tell ABC State University how to value the progress toward its retention improvement goals; rather, it provides flexibility for the institution to determine a value that reflects its mission and strategy.

By attributing value to the social impacts of a project in an ROI analysis, institutions have the power to account for their mission and values in the evaluation of new and existing initiatives. This power must be used responsibly. *Attributed value should not be used to bring the ROI of every project into positive territory.* With management of costs, financial sustainability and rising tuition rates on the minds of many institutional leaders and stakeholders, it is crucial that leaders use fair and consistent judgment in attributing value to social outcomes to maintain the credibility of their analysis and investment decisions.

Using ROI to Make More Informed Decisions

Colleges and universities have greater difficulty calculating returns on their investments than people making similar calculations related to investments in hard goods, real estate or securities. While ROI is relatively simple when the measure of success is strictly a financial return, success for a higher education institution is multifaceted and complex. Given the complexity, ROI analysis should be approached as a way to take stock of

the costs and benefits of a project in order to compare it to other projects or to assess whether it generates a return to the institution. By leveraging ROI to inform decision-making, institutional leaders can move toward more systematic evaluation of opportunities and initiatives that require investment and may have potential to move an institution toward its goals.

NOTES ON USING ROI

- ROI can be used to assess a prospective investment or to measure an investment's return retroactively. In forward-looking analyses, future returns may be difficult to predict accurately and should be estimated as a range. It is helpful to think about acceptable ranges for ROI and the likelihood that your project will generate ROI in that range.
- ROI doesn't inherently capture the factor of time. As a result, two projects that generate the same return over very different time horizons would have the same ROI. It's important to consider the implications of time horizon in your evaluation of projects.
- The size of investment also matters: A \$500 project and a \$2 million project may each generate a 10% ROI, but they generate very different returns in total dollars (\$50 and \$200,000, respectively).
- Some organizations set minimum ROI thresholds for their investments. For example, you may decide that only projects with a 5% or greater ROI are "worth it."

CONSIDERATIONS FOR ATTRIBUTING VALUE TO SOCIAL OUTCOMES

- Institutional goals for:
 - Student success.
 - Target student demographics or populations.
 - Accessibility of courses or programs.
 - Costs to students.
- Potential downstream effects of the social outcomes of the project, including improved job placement rates, higher lifetime earning potential and positive economic impacts for a community.

The ASU Framework for Assessing the Return on Digital Learning

Why Develop an ROI Framework for Digital Learning Initiatives?

To support higher education institutions to make better decisions as they formulate their strategies for digital learning, Arizona State University and Boston Consulting Group collaborated to examine the return on investment of digital learning initiatives in six different institutional contexts. This project had three primary goals:

1. To define what ROI means in a digital learning context.
2. To assess the impacts of digital learning on enrollment, student learning outcomes, and costs for institutions and students.
3. To identify and share lessons and best practices from different implementations of digital learning.

ASU and BCG released their findings in a 2018 report titled “Making Digital Learning Work.” The report introduces a framework for evaluating the ROI of digital learning initiatives and offers guidance for institutions seeking to systematically evaluate and improve their digital learning strategies. The ASU ROI framework was developed with input from an advisory committee of thought leaders from across the institutional and industry realms and is a useful tool for evaluating digital learning as a path toward institutional goals.

In this analysis, **digital learning** was defined as technology-enabled instruction that gives students and faculty greater flexibility in how, when and where learning occurs. This project focused on three types of digital learning implementation: fully online programs, online courses and mixed-modality courses.

The ASU ROI Framework

Working together with institutions and the advisory committee, the team from ASU and BCG determined that the ROI for digital learning should be a measure of the return for both an institution and its students, consisting of three components:

- Impacts on student *access* to higher education.
- Impacts on student learning *outcomes*.
- Impacts on institutional and student *economics*.

These three components represent common goals for implementing digital learning, as well as areas of progress or change that institutions report as a result of their use of digital learning.

The project team assessed the impacts of digital learning on these three components by working closely with six institutions that had implemented digital learning at scale. The team spent two months gathering information on each institution through site visits, interviews and data collection. This case study approach allowed for extensive data collection and development of a strong understanding of the different digital learning strategies of each institution. It also allowed for needed flexibility in data collection. The limitation of using a case study approach was that identifying generalizable findings between digital learning initiatives and their outcomes was difficult. Despite this, the approach outlined in the report can be used to inform institutional exploration of digital learning and the related ROI analysis.

Measuring Digital Learning Impacts on Access, Outcomes and Economics

Isolating and measuring the costs and returns of a digital learning initiative to calculate its ROI can be very complicated. For example, to understand the costs of a mixed-modality digital learning implementation relative to a face-to-face base case, an institution would need to consider the direct costs of the mixed-modality course (the costs of development and instruction, for example) relative to the direct costs of a comparable face-to-face course, plus indirect costs like those related to changes in how administrators and faculty spend their time. Each of these costs would need to be adjusted for the number of students served in each scenario. Most institutions have limited capability to do detailed “what if” scenario analysis in advance of a project; as a result, ROI is more often evaluated once a project is underway.

To help institutions get started with assessing ROI, “Making Digital Learning Work” suggests the types of data to include as inputs in the ASU ROI framework. The table below shows which metrics may be useful to track for each component of the framework and how those metrics can be measured.

Components of Digital Learning ROI and How to Measure

	Hypothesis*	Metrics	How to Measure
Access	Digital learning implementation can broaden access to high-quality education, particularly for disadvantaged student groups.	<ul style="list-style-type: none"> ● Enrollment (total and separately for digital and face-to-face courses). ● Representation of target student populations (e.g., Pell Grant recipients, minority students, female students, students age 25 or above). 	Review total credit hours and enrollment during the digital learning implementation period. Disaggregate the data by course delivery modality and student demographic data to detect overall growth of enrollments and shifts in the proportions of particular student populations over time. Compare the proportion of students from target populations in face-to-face courses versus digital courses.

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	Hypothesis*	Metrics	How to Measure
Outcomes	Digital learning implementation can deliver equivalent or improved quality of education and student learning outcomes.	<ul style="list-style-type: none"> ● Program outcomes like rates of degree completion, year-over-year retention, graduation and transfer to other institutions (total and separately for programs with digital learning and face-to-face courses). ● Course outcomes like percentage of students earning A, B or C grades, or DFW (drop, fail, withdraw) rates. ● Performance gap between different student populations. 	Group students within the same academic year by the number or type of digital courses they took during a particular period (e.g., students who took no digital courses, students who took at least one but not all digital courses and students who took 100% digital courses). Compare program outcomes, like retention, completion and time to degree across these groups. Compare the course level outcomes, ABC rates and DFW rates of sections of the same course that are taught face-to-face versus in digital modalities. Ideally, these outcomes would reflect the same time period; however, it may be necessary to compare outcomes from different years.
Economics	Digital learning implementation can help improve the financial picture of institutions and students by lowering costs or by raising revenues.	<ul style="list-style-type: none"> ● Student economics: Cost of course materials, tuition expenditures and potential salary earnings from earlier entry into the workforce. ● Institutional economics: Cost of implementing digital learning (employees, technology, infrastructure, etc.); income from tuition, fees and grants. 	<p>For student economics, look at the cost of course materials in face-to-face versus digital modalities, and consider the impact of the time to graduation on total tuition expenditures and potential salary earnings.</p> <p>At the institutional level, compare instructional, operations and student support and other costs at the per-student level. For example, compare instructional costs by gathering data on student enrollment numbers and the types of instructors (full-time versus adjunct) leading face-to-face and digital courses. Calculate instructional cost per student in different modalities.</p>

*Compared to face-to-face base case

To holistically evaluate the return from a digital learning initiative using the ASU ROI framework, the ROI from that initiative should be compared with the actual or projected ROI from maintaining the status quo or taking on other projects, like investments in campus-based instruction. This provides a basis for comparing different prospective or ongoing projects, in addition to evaluating whether a project is going to produce a positive return.

Key Findings and Implications for Digital Learning Strategies

ASU and BCG's detailed analysis of digital learning implementations at the six case study institutions not only informed the creation of the ASU ROI framework but also produced important findings that can shape how other higher education institutions think about their own digital learning strategies. Highlights from the report regarding the impacts of digital learning are provided below.

Selected Impacts of Digital Learning Implementation

Key Research Findings	
Access	<ul style="list-style-type: none"> ● Overall enrollment grew as the use of digital learning expanded. ● Target student populations grew as a proportion of the whole as the use of digital learning expanded. <p>Takeaway: Access to education for all students, including target student populations, can be expanded with greater use of digital learning.</p>
Outcomes	<ul style="list-style-type: none"> ● Students taking a portion of their courses online and a portion face-to-face experienced improved retention and graduation rates compared with students taking 100% face-to-face courses. ● One institution showed that students taking a portion of their courses online had a shorter time to graduation compared with students taking all courses face-to-face. ● Digital learning had mixed impacts on course grades, in some cases showing decreases in grades despite improved retention, supporting the “digital learning paradox” that other researchers have observed in past analyses. ● Adaptive courseware helped close achievement gaps for minority students and Pell Grant-eligible students compared with non-minority students and students ineligible for Pell Grants. <p>Takeaway: Digital learning programs and courses can result in student outcomes that are equivalent to or improved compared to face-to-face instruction, with the best outcomes noted for students taking a portion of their courses in digital modalities.</p>
Economics	<ul style="list-style-type: none"> ● Online courses have higher student-to-instructor ratios and use more adjunct or part-time faculty. Combined, these factors lower instructional costs per credit hour compared to face-to-face courses. ● Online learning has different infrastructure and maintenance costs. For example, online courses require less physical space on campus to serve more students. However, they can require investment in other infrastructure, like improved Wi-Fi on campus and digital support teams. <p>Takeaway: Carefully planned digital learning initiatives can reduce institutional course delivery costs compared with face-to-face learning.</p>

Conclusion

While applying the ASU ROI framework requires an investment of time and resources, it has the potential for significant dividends. These dividends come in the form of more systematic evaluation of digital learning investments, a data-based approach for decision-making, and ultimately more-effective resource allocation to support a digital learning strategy. At a time when higher education institutions' investment decisions are coming under increased scrutiny, the ASU ROI framework can provide both internal and external stakeholders with greater confidence in institutions' decision-making processes and ultimate allocation of funds. This is a necessity if institutions are to continue to work toward better serving students with digital learning initiatives, while increasingly constrained by limited resources.

Preparing to Make Data-Driven Decisions About Digital Learning

Higher education institutions looking to adopt digital learning initiatives are using copious and disparate data to conduct analyses and evaluate their decisions. To prepare your institution to make data-driven decisions related to digital learning, this brief includes recommendations for two foundational steps: establishing a team and organizing your data.

Establishing a Team

Thinking in advance about who will be part of your institution's digital learning implementation team will help you identify the primary users and sources of the data you will need for measuring results and making decisions about the initiative. Mapping your team will help you plan for effectively sharing and using that data.

To help in your thinking, the following chart provides examples of the kinds of different project roles that generate, collect, use and share data in a digital learning initiative.

Role	Description	Data Role	People / Teams Who Might Fill Role
Implementation Project Lead	The individual charged with leading an institution's digital learning implementation from start to finish	Use historical and current data to make decisions about digital learning planning and execution and to track progress toward goals. Share data with institutional leadership and project stakeholders.	Principal Investigator, Project Director, Program Director
Executive Sponsor	Highest-level institutional advocate for the implementation	Use data to make executive-level decisions about implementation.	Provost, Vice-Provost, Student Success Leader
Academic Leads	Individuals or groups with decision-making power with respect to resource allocation and academic curricula	Use data to make decisions about where and how to implement digital learning at the program and course levels.	Academic Affairs, College Deans, Academic Chairs
Instructors	Faculty and instructors teaching the courses where digital learning is being implemented	Generate data through the decisions they make about course curriculum and activities. Use data to inform day-to-day instruction and course redesign.	Faculty, Instructors
Students	Students enrolled in the courses or programs where digital learning is being implemented	Generate data through their interactions with the digital learning solution and instructor. Use data to track their own progress and inform their studies.	Students

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Role	Description	Data Role	People / Teams Who Might Fill Role
Information Technology	High-level IT manager or CIO who manages the data warehouse or central repository	Ensure that data is managed and maintained in a data warehouse or central repository and that users of data can access reports from the central repository as needed.	CIO, Assistant Vice President of Data Systems
Teaching and Learning Support	Individuals with expertise in instructional design or in teaching and learning who can provide a wide range of support services related to course design, development, delivery and evaluation	Use data on student performance to help academic leaders and instructors make decisions about course design and instructional practices.	Instructional System Designers, Instructional Designers, Subject Matter Experts, Project Managers
Research and Analytics	Individuals, units and service providers who can pull and analyze implementation data	Collect data from across systems, clean data and complete analysis to share with the stakeholders above.	Institutional Research, Institutional Effectiveness

If you choose to work with vendors that offer digital learning products or services, they will also need to be part of the team that shares data. Data-sharing agreements are included in your contracts with vendors and should be carefully reviewed to make sure that the data sharing and security policies are in line with federal, state and institutional standards and meet institutional needs for the implementation. Additionally, you should explore whether your vendors and institution have adopted standards like [IMS Caliper Analytics](#) or [IMS Learning Tools Interoperability](#), which make it easier to collect, transfer and analyze data across systems.

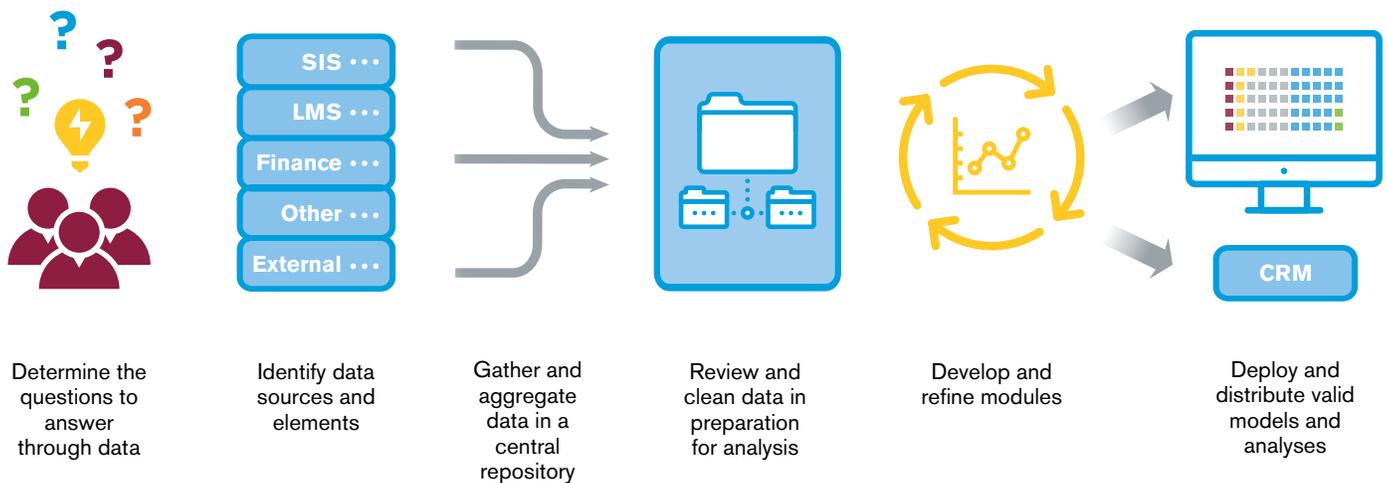
Organizing Your Data

Gathering data alone will not lead to change. Goals must be established to guide the collection of data, and the data must be translated into information that can inspire action. For this to happen, your digital learning data initiative should follow these steps:

- 1. Determine which questions you hope to answer through data.** This depends on your goals for the digital learning initiative, which should be established in coordination with the team that is implementing digital learning and should be in alignment with the institution's mission and strategy. For example, if your institution is working to improve graduation rates by 5 percent over the next five years, it may look to data to understand which students are dropping out and if there are trends among those students in terms of courses or programs of study, student demographics, etc.
- 2. Understand the data resources available to you and identify which data is needed to help answer your questions.** This data may come from a range of systems, such as your learning management system, student information system, enrollment management system, financial aid system and others. Talk with individuals at your institution to learn what data and data systems are currently in use. You may also learn from colleagues at peer institutions or your vendor about how other institutions make use of the data available to them.
- 3. Aggregate data from different sources into a single repository.** A data repository is a place where data is organized and stored for analysis. This single data repository will be the "ground truth" or the sole source of official information for everyone involved in the initiative. This step shifts the discussion from "which data is correct?" and "where do we find the data?" to "what do we do with this data?" The data in the system should be correct and should be jointly maintained by IT and Research and Analytics.

4. **Review data and prepare it for analysis.** A key step in preparation is to clean the data by identifying inaccuracies. A process can be developed to work with data stewards to correct inaccurate data in the source systems. Routine checks of the data, followed by corrections by the data stewards and reloading of the data repository, should occur on a regular basis.
5. **Develop analytical models for data analysis.** Analytical models are algorithms that use data inputs to help explain, simulate or predict complex relationships. For example, predictive analytics models have been used in higher education to predict which students are more likely to drop out of a course, based on data like previous educational experience, academic performance and study habits.
6. **Deploy the analytical models with a continuous improvement mindset.** Analytical models should be evaluated and revised as needed to reflect changes in the environment. New data points can be used to help “train” the models to make them more effective.

Steps to Organize Data for Data-Based Decision-Making



Additional Resources to Explore

- “Putting Data to Work,” eLearning Guild
- “Vision for Learning Analytics at MSU,” Michigan State University
- “A National Model for Student Success,” Georgia State University
- “How Higher-Education Institutions Can Transform Themselves Using Advanced Analytics,” McKinsey & Company

Facing the “Build or Buy” Question in Digital Learning

When implementing digital learning, institutions have the option of turning to a wide variety of third-party educational technology products and services or developing products and services in-house. Navigating the “build or buy” decision and predicting the impacts of that decision over time can be overwhelming, especially for institutions new to digital learning.

In the decision to build or buy, there is no right answer, and the institutions featured in “Making Digital Learning Work,” a 2018 report produced by Arizona State University and Boston Consulting Group, employ a range of approaches. On one end of the spectrum is the University of Central Florida, which invests significantly in internal capacity to create and sustain its online-learning offerings. On the other end of the spectrum is Arizona State University, which reports using over [130 third-party](#) tools in its online courses. Both of these institutions are leaders in digital learning and serve tens of thousands of students annually in online courses and programs. UCF invests relatively more in faculty support, instructional design and instructional content creation to support its digital learning programs, whereas ASU invests relatively more in fees and subscriptions with third-party products and services. In both cases, these strategies have enabled successful scaling that works for each institution.

To help with the decision to build or buy a digital learning solution (whether a digital learning product, a customization of a product or course design services), this guide presents a handful of important considerations for your institution. We recommend that these considerations be explored by the individual with decision-making power, with input from colleagues in different units at the institution, like information technology, academics and finance. The result of the exploration is not likely to be a clear “yes” or “no” to either build or buy, but it should help decision-makers move toward a better understanding of the risks and benefits of both options.

Digital Learning “Build or Buy” Considerations



Digital Learning “Build or Buy” Considerations



ROI Roundup

Resources for Evaluation of Return on Investment in Higher Education Projects

Higher education institutions are investing in student success initiatives and in teaching and learning initiatives to better serve their students. These initiatives take advantage of new technologies and best practices that enable institutions of higher education to improve student outcomes, increase student access, and leverage resources more effectively.

Decision-makers who are exploring where and how to invest need to evaluate and compare the impacts of different initiatives. The table below lists ROI evaluation resources for three key types of initiatives: digital learning, developmental education and student advising.

Initiative	Resource Description	Who Should Use This Resource?
Digital Learning Digital learning is technology-enabled instruction that gives students and faculty greater flexibility in how, when and where learning occurs.	“Making Digital Learning Work,” by Arizona State University and Boston Consulting Group, looks at the ROI from digital learning implementations at six institutions. The report introduces the concept of ROI being composed of three components—access, outcomes and economics—and includes data on how digital learning implementations impact those three components across different institutions. It also includes seven promising practices for digital learning implementation.	Academic leaders who are considering implementing digital learning and are seeking to understand how it can help their institution achieve goals related to access, outcomes or economics.
Developmental Education Developmental education programs help students who are unprepared for college-level courses become equipped for postsecondary success.	“Understanding Impact,” by Strong Start to Finish, looks at the impacts of developmental education reforms on three components of higher education ROI: access, outcomes and economics. The reforms included are compression, placement, pathways and pedagogy.	Institutional leaders who are weighing different developmental education reforms.
	The Strategic Investment Impacts series in Strong Start to Finish’s Resource Library provides resources to guide calculation of potential inputs to an ROI analysis.	Business analysts who are reviewing costs and returns of developmental education.

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Initiative	Resource Description	Who Should Use This Resource?
<p>Student Advising</p> <p>Student advising is a planning and information sharing process that guides students in making decisions about their academic paths to help them achieve their goals.</p>	<p>EDUCAUSE's Return on Investment Toolkit, developed with RPK Group, includes a suite of digital resources for thinking about and calculating returns on investment from changes in advising. This toolkit recommends three shifts to make when looking at student success initiatives through an ROI lens: considering people and time as part of the cost of an investment; looking at per-student costs rather than total costs; and connecting student success with financial sustainability. The resources include a road map, case studies, and an ROI calculator spreadsheet that allows users to input costs and information on student credit hours to generate ROI from an intervention.</p>	<p>Business analysts and project managers who are seeking guidance on the process of implementation and a resource for calculating costs per student and ROI.</p>
	<p>"Turning More Tassels," by Boston Consulting Group and NASPA, looks at the impacts of advising reforms on different components of holistic ROI—access, outcomes and economics. The report focuses on advising reforms at four institutions and shares the impacts that those institutions have experienced through their advising reforms. Tips for implementing reforms at an institution are also included.</p>	<p>Leaders in the area of student success who are considering implementation of advising reforms. The report provides information on impacts plus high-level tips for success.</p>

DIGITAL LEARNING IN ACTION

How Arizona State University Uses Data to Achieve Its Digital Learning Goals

Digital Learning Is Core to ASU's Mission and Goals

Arizona State University is differentiated among four-year research institutions by its focus on student access. The ASU charter states that the university should be “measured not by whom it excludes, but rather by whom it includes and how they succeed,” and the institution sets goals that reflect this mission. Among ASU's 2025 goals are measurable outcomes related to student access and success, including:

- Enhance quality while reducing the cost of a degree.
- Enroll 100,000 online and distance-education degree-seeking students.
- Improve freshman persistence to greater than 90 percent.
- Increase the university graduation rate to greater than 80 percent and more than 32,000 graduates.

In pursuit of these targets, ASU has developed a portfolio of digital learning with three primary course offerings. ASU Online offers fully online courses and programs that help to increase access to the institution. iCourses – online courses offered to campus-based students – improve course flexibility and access. Adaptive learning courses – face-to-face and online courses delivered using adaptive learning technologies – aim to boost student success.

Data Analysis Helps ASU Continually Improve Its Digital Learning

ASU collects and uses data on student performance, student access, course quality, resource usage and more in order to make data-based decisions about the approaches it uses to achieve its objectives. In fact, ASU has a research and development group, called The Action Lab, focused on making assessments about the quality, efficacy and outcomes of digital learning. Below are examples of how ASU uses data to continuously improve its digital learning offerings.

- **Using vendor partnerships strategically to support growth and manage costs.** By regularly reviewing its vendor relationships and internal needs and capabilities, ASU makes informed decisions about starting, maintaining and ending contracts with vendors to help achieve institutional goals while

AT A GLANCE



- Total enrollment of over 103,000, with over 83,000 undergraduates and nearly 20,000 graduate students
- ASU serves a diverse undergraduate student population:
 - 48.5% female, 51.5% male
 - 50% white
 - 23% Hispanic
 - 7% Asian
 - 4% black / African American
- 33% of first-time freshmen are Pell Grant eligible

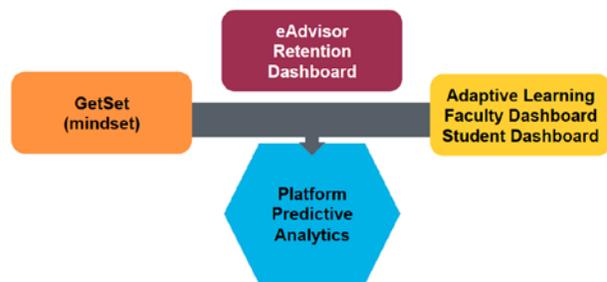
FALL 2017 STATISTICS; DEMOGRAPHIC DATA INCLUDES STUDENTS ON METROPOLITAN PHOENIX CAMPUSES ONLY.

managing costs. For example, to help achieve its ambitious growth targets for online programs and ensure the success of new students at ASU, the institution partnered with an online program management company in 2010. The partner helped with student acquisition and student support, allowing ASU to access expert assistance while managing its risks and costs in pursuit of its growth goals. In 2016, after building its own expertise and scale, ASU decided to bring the student support function in-house. This decision was based on an analysis of costs, level of institutional control and quality of services.

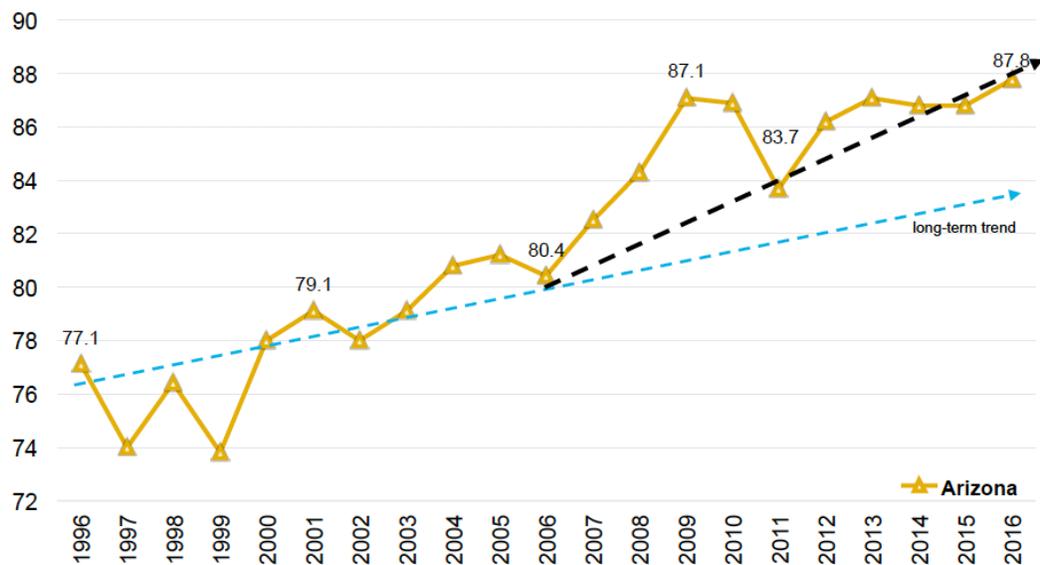
- **Leveraging best practices and regular feedback to improve digital courses.** New or refreshed digital courses undergo a design process that includes faculty onboarding, use of a Quality Matters rubric for course design, pairing of faculty members with an instructional designer, and course readiness checks by students before launch. However, the course design process doesn't end there. Each semester, a 360-degree course review is completed that collects feedback to inform further course improvements. Through this approach, underperforming courses are identified early and receive design support to enable ongoing improvement for greater student success.

- **Integrating systems to aggregate data that helps ASU meet student needs.** To identify at-risk students early and keep those students engaged and enrolled, ASU has worked to integrate its various sources of student information to feed its predictive analytics platform and anticipate student needs. By integrating the data from its different systems, ASU not only improves outcomes for students but also keeps better track of how its vendor partnerships and interventions are impacting student success in order to make informed decisions about the value of those relationships and interventions.

Integration of Information Sources



Arizona Freshman Retention Rate and Interventions in Use by Year



eAdvisor	▶	Retention Dashboard	▶	Predictive Analytics	X	X												X	X
Adaptive Learning		(expansion to 20,000 students)					X	X	X	X	X	X	X	X	X	X	X	X	X
GetSet																		X	X

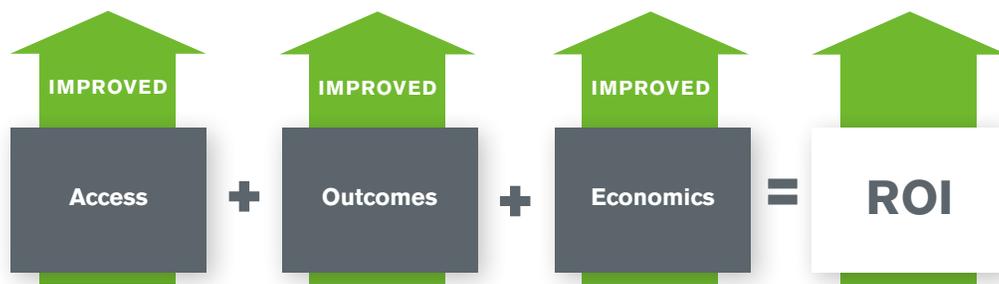
How ASU Sees the Return on Its Investment in Digital Learning

In 2018, Arizona State University and Boston Consulting Group released “Making Digital Learning Work,” a report based on over two years of analysis on the return on investment from digital learning initiatives in six institutional contexts. The report identifies three components of the return realized from an institution’s investments in digital learning: impacts on student *access* to higher education, impacts on student learning *outcomes*, and impacts on institutional and student *economics*.

ASU’s investment in digital learning has impacted these three components in many ways, including:

- **Increasing access to ASU courses for target student populations.** At ASU, the student base taking exclusively online courses looks different from the student base taking exclusively face-to-face courses in several important ways: on average, online students are older (30 years old versus 22), more female (57 percent versus 39 percent) and more likely to receive federal financial aid in the form of Pell Grants (39 percent versus 32 percent).
- **Improving course outcomes through adaptive courseware.** Over 8,000 undergraduate students enroll in College Algebra each year at ASU. The historical course success rate (students receiving a C or better) was in the mid-50 percent range, indicating that the course needed a major overhaul. It was redesigned using adaptive courseware for the fall 2016 semester, and the student success rate improved by 20 percentage points compared with the fall 2015 cohort. This translated into over 650 additional students in the fall 2016 cohort passing the course at first attempt as compared to the fall 2015 cohort.
- **Lowering resource use and cost to students, while driving revenue for the institution.** Online courses help to control resource use at ASU. For example, sections for online courses at ASU are significantly larger than sections for face-to-face courses, reducing instructional cost per credit hour. Students pay about 30 percent less per credit hour¹ to enroll in ASU online courses compared with on-campus courses. Overall, ASU reports resource use per degree of 17 percent less than its peers.² At the same time, online learning helps drive revenue for the institution through higher enrollment growth in online programs than face-to-face programs.

While not all institutions have similar results from their digital learning initiatives, this case study shows how digital learning can produce a positive return on investment.



1. Compares online tuition and fees to resident tuition and fees for campus-based courses for students taking up to 7 credit hours per semester. For students taking more than 7 credit hours per semester, the discount for online versus face-to-face courses is reduced.
2. https://president.asu.edu/sites/default/files/abor_strategic_enterprise_plan_final_020819.pdf

DIGITAL LEARNING IN ACTION

How Georgia State University Uses Adaptive Courseware to Deliver Improved Outcomes for Students

GSU Has a Strong Record of Using Data for Student Success

Georgia State University was an early pioneer in the use of data to build new approaches to serve students better. The institution monitors over 800 academic risk factors, which are used to inform advising interventions. When it introduced predictive analytics in 2012, GSU hired more advisors, bringing the student-to-advisor ratio from 700-to-1 to almost 300-to-1. Multiple efforts on campus have raised 6-year graduation rates from 48 percent in 2010 to over 55 percent in 2018 and have eliminated achievement gaps based on race, ethnicity and income level. Tim Renick, senior vice president for student success at GSU, estimates that 75 percent of the institution's improvement in graduation rates can be attributed to the implementation of initiatives based on predictive analytics.¹

Transitioning from a Targeted Intervention to a Strategic Initiative

In the early 2000s, introductory-level math courses—pre-calculus, college algebra and elementary statistics—were major hurdles to success for many GSU students. With the percentage of students earning a D grade, failing or withdrawing from these classes regularly topping 40 percent, these three courses caused many students to lose scholarships or drop out altogether.

In 2005, GSU launched a course redesign project to improve student success in these courses. With the move to an emporium model, students now attend class in a computer lab environment where they learn content and complete practice, receiving personalized feedback through adaptive courseware. Non-pass rates across the three math courses have dropped from an average of 31 percent in 2007 to 23 percent in 2014.²

With its success in math, GSU in 2014 pursued more adoptions of adaptive courseware in other redesigned gateway courses, including psychology, English and economics. In 2016, GSU was awarded a grant from the Association of Public and Land-grant Universities to support the implementation and scaling of adaptive

AT A GLANCE



- Total enrollment of over 53,000, with 46,000 undergraduates and 7,000 graduate students
- GSU serves a diverse undergraduate population:
 - 60% female, 40% male
 - 39% black / African American
 - 26% white
 - 13% Asian
 - 11% Hispanic
- 54% of first-time freshmen are Pell Grant eligible
- 38% of undergraduate students take at least some courses online

FALL 2017 STATISTICS

courseware in high-enrollment general education courses. The implementation launched in fall 2017 with 28 sections of four courses. By fall 2018, the implementation had grown to reach over 7,500 enrollments across five courses, and it is expected to scale to reach at least 15 percent of total general education course enrollments by 2020.

GSU also took a step to formalize its commitment to using technology solutions like adaptive courseware by including technology use in its strategic plan. In its 2016 update to the [2011 strategic plan](#), GSU recommitted to the 2011 goals, tracked progress to date and listed new initiatives planned to help the institution achieve its goals. The use of adaptive courseware fits squarely into goal 1 from the strategic plan and a new related initiative:

Goal 1: Become a national model for undergraduate education by demonstrating that students from all backgrounds can achieve academic and career success at high rates.

Initiative: Find the balance between technology and human interaction in instruction so that education and student success outcomes are greatly enhanced.

Georgia State is committed to using new technologies to create an academic environment that enhances teaching and learning for all students. Our use of analytics and adaptive learning systems will allow us to individualize the students' experiences in their coursework just as it has improved and focused our advisement. The use of analytics allows us to customize students' learning experiences, allowing us to deliver individualized instruction at scale.³

By including the use of technology in instruction in the strategic plan, GSU communicates to faculty, administrators, students and other stakeholders that instructional technologies are core to the institution's strategy for student achievement. Furthermore, by pointing to success using data and analytics to improve student outcomes through advising, GSU is demonstrating that it is building on knowledge and success as it seeks to improve the student experience in its courses through thoughtful integration of technology and human interaction.

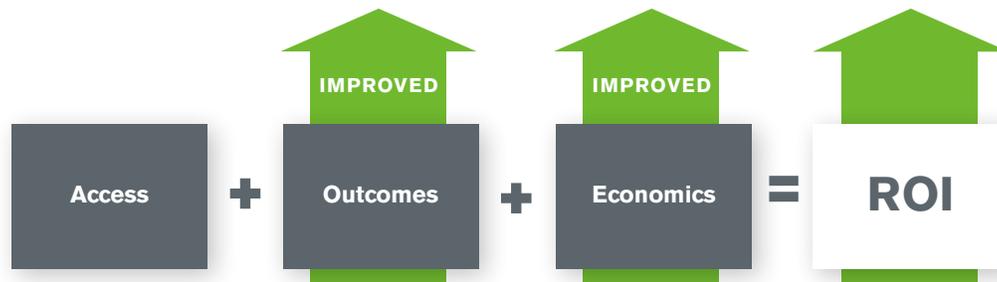
How Adaptive Courseware Can Boost Return on Investment in Digital Learning

In 2018, Arizona State University and Boston Consulting Group released "Making Digital Learning Work," a report based on over two years of analysis on the return on investment from digital learning initiatives in six institutional contexts. The report identifies three components of the return realized from an institution's investments in digital learning: impacts on student access to higher education, impacts on student learning outcomes, and impacts on institutional and student economics.

Use of adaptive courseware has the potential to impact these three components in many ways, including:

- **Improving student learning outcomes.** GSU has a record of improved student outcomes in its introductory math classes through course redesign that incorporated adaptive courseware. Prior to the redesign, these courses acted as gatekeepers to student success, with the potential to entirely derail a student's postsecondary experience. By bringing down barriers in introductory math, GSU not only enabled improved course outcomes but also set students down a path toward better achieving their program and degree goals. Outside of GSU, separate studies have found small but statistically significant improvements in students' grades in course sections that are using adaptive courseware compared with sections that are not.⁴
- **Reducing instructional costs over time.** Costs to the institution are likely to grow during the first term of implementation due to investments in infrastructure and faculty training. However, studies suggest that overall per-student costs to the institution may decline over time, and that students may also see cost savings in sections that are using adaptive courseware compared with sections that are not.⁵

More research and analysis are needed to further explore the effects of adopting adaptive courseware. However, data collected so far suggests that the impacts of implementing adaptive courseware as part of a course redesign may translate to a boost in return on investment for an institution implementing digital learning.



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1. <https://edscoop.com/predictive-analytics-tools-are-boosting-graduation-rates-and-roi-say-university-officials/>
 2. <https://success.gsu.edu/initiatives/adaptive-learning-tools/>
 3. <https://strategic.gsu.edu/preamble-2/goal-1/>
 4. https://www.sri.com/sites/default/files/publications/next_generation_courseware_challenge_evaluation_final_report_dec_2018.pdf
 5. https://www.sri.com/sites/default/files/brochures/almmap_final_report.pdf

DIGITAL LEARNING IN ACTION

How Houston Community College Leverages Digital Learning and Open Educational Resources to Increase Access to Higher Education

Long History of Digital Learning at HCC

Houston Community College began offering online and blended courses in the 1990s to better serve its diverse learner population: 70 percent of HCC's undergraduate students are enrolled part-time and 44 percent are age 25 or above. The number of students enrolled in distance courses grew by 16 percent from 2012 to 2017. Over the same period, total HCC undergraduate enrollments declined in line with national trends, falling 2 percent. In 2018, HCC's investment in digital learning reached a new level with the launch of its own online college, called HCC Online. HCC Online currently offers 32 fully online degree and certificate programs, a number expected to triple by fall 2019. According to institutional leaders, the online college demonstrates HCC's commitment to serving the needs of online learners and is in line with HCC's mission to expand educational and workforce opportunities for its communities.¹

Building Open Educational Resources into HCC Strategy

Prior to 2015, students, administrators and faculty at HCC advocated for the use of OER to help reduce the cost of instructional materials to students. At the time, individual faculty lacked the highly organized institutional support and coordination required to take on a major OER initiative. This changed in 2015 and beyond with the help of a few catalysts:²

1. Fall 2015 creation of an OER capstone project to explore the development of an OER program, leading to the formation of an OER task force.
2. Spring 2016 presentation to the HCC Board of Trustees from a student group on campus regarding the burden of instructional materials costs and promoting the use of OER.
3. Spring 2016 application for an OER grant from Achieving the Dream. While this grant was not ultimately awarded to HCC, the application process helped focus and prioritize plans for OER use at the institution.
4. Summer 2016 discussion with the Kinder Foundation to support launch of a Z-degree (zero textbook cost) program through grant funding.

AT A GLANCE



- Among the largest institutions in the U.S.
- Total enrollment of nearly 115,000, with over 57,000 undergraduates and nearly 58,000 non-credential students
- HCC serves a diverse undergraduate student population:
 - 58% female, 42% male
 - 34% Hispanic
 - 28% black / African American
 - 13% white
 - 10% Asian
- 52% of first-time freshmen are Pell Grant eligible
- 36% of undergraduate students take at least some courses online, and 13% of undergraduates take all of their courses online

FALL 2017 STATISTICS

HCC's [2019 Strategic Plan](#), released in 2016, includes promoting the use of OER in support of two strategic objectives:

Objective: Increase Innovation in Teaching and Learning

Initiative: Develop and provide access to high quality shared instructional resources

Objective: Increase Student Completion of Degrees, Certificates and Other Awards

Initiative: Provide greater resources and access to supplemental learning

Inclusion of OER in HCC's strategic plan was important because it placed OER initiatives on the road map to the future and therefore positioned them for funding through the HCC budget process. In 2017, the Kinder Foundation provided a \$300,000 grant to the institution to support the development of HCC's first Z-degree program. In fall 2017, HCC introduced three complete Z-degree choices: an AA in business administration, an AA in general studies and an AS in general studies. During the 2017–18 academic year, HCC's [Z-degree program](#) reached about 1,900 students, saving them an estimated \$190,000 in instructional materials costs. Additionally, OER expansion at HCC has grown dramatically outside of the Z-degree program, now saving students approximately \$2 million per academic year. These savings will continue to grow in future years.

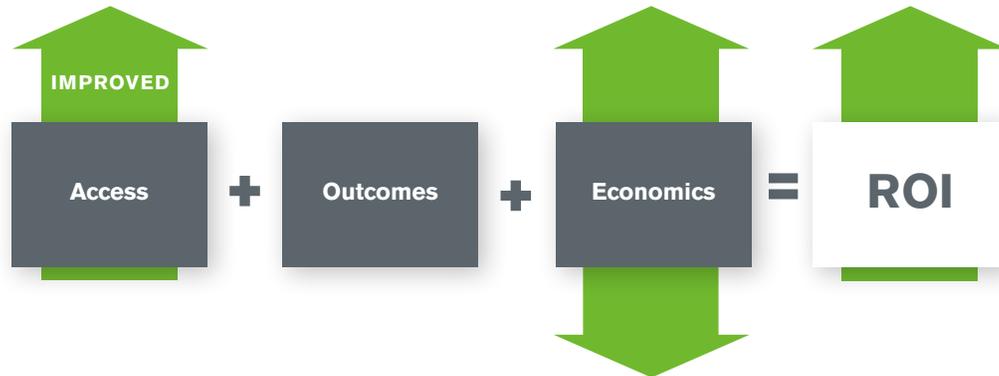
OER Can Boost Return on Investment in Digital Learning

In 2018, Arizona State University and Boston Consulting Group released “Making Digital Learning Work,” a report based on over two years of analysis on the return on investment from digital learning in six institutional contexts. The report identifies three components of the return realized from an institution's investments in digital learning: impacts on student access to higher education, impacts on student learning *outcomes*, and impacts on institutional and student *economics*.

Use of OER has the potential to impact these three components in many ways, including:

- **Negating some of the adverse impacts of instructional materials costs on course-taking practices.** A 2016 survey of over 22,000 students conducted by Florida Virtual Campus showed that 47.6 percent of students took fewer courses and 45.5 percent didn't register for a specific course due to the cost of textbooks.³ Courses using OER can have minimal or no instructional materials costs, helping to broaden student access to the courses they want or need to take to achieve their goals.
- **Maintaining learning outcomes in sections or courses using OER.** Several studies have shown that educational quality, as indicated by student success metrics, in courses using OER is at least equal to the educational quality in courses that use commercially available instructional materials.⁴ A recent study of outcomes at the University of Georgia also suggests that adopting OER may be a strategy to reduce the achievement gap.⁵ Further, faculty using OER ensure that textbooks and other instructional materials are available to students on the first day of class—another factor that can lead to student success.
- **Impacting the economics of digital learning by reducing cost of attendance to students.** 2018 survey data showed that, nationwide, students spent an average of \$484 on course materials during the 2017–18 academic year. This is down from \$579 the previous year, and a decrease of more than \$700 over the previous decade. The decline is attributed to increased use of free and lower-cost instructional materials.⁶ However, institutions should also consider the cost to the institution of OER implementation. For example, HCC's OER program expenses include faculty stipends for OER course development and training, a full-time OER coordinator, a contract with Lumen Learning and more. Such costs will be relevant and significant for many institutions taking on a new OER initiative.

At a high level, the use of OER may translate to a boost in return on investment for an institution implementing digital learning, as shown below.



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1. <https://www.hccs.edu/about-hcc/news/articles/hcc-launches-new-online-college-with-32-fully-online-degrees.html>
 2. <https://www.cccoer.org/casestudy/building-a-z-degree-foundation-business-administration-multi-disciplinary-studies/>
 3. <https://florida.theorange grove.org/og/file/3a65c507-2510-42d7-814c-ffdefd394b6c/1/2016%20Student%20Textbook%20Survey.pdf>
 4. <https://link.springer.com/article/10.1007/s11423-016-9434-9>
 5. <http://microblogging.infodocs.eu/wp-content/uploads/2018/07/IJTLHE3386.pdf>
 6. <https://www.nacs.org/advocacynewsmedia/pressreleases/tabid/1579/ArticleID/771/Course-Material-Spending-Declines-for-2017-18-Academic-Year.aspx>

DIGITAL LEARNING IN ACTION

Online Learning at the University of Central Florida Delivers Quality and Cost Savings for Students and the Institution

Online Learning Is Integral to UCF

In 1996, the University of Central Florida entered the world of online learning with a handful of courses. This decision was the result of converging factors, including plans to grow enrollment significantly to increase access for remote students while minimizing costs. UCF also launched mixed-modality courses (where course activity is both online and face-to-face) that provided students with flexibility in scheduling and location.

From the beginning, UCF's investment in online learning has been based on the premise that online education is core to the university's mission rather than a separate initiative with its own goals. Instead of outsourcing its online program development, UCF invested in its own staff to be experts in online learning and instruction. In addition, impact evaluation has been an integral part of online learning at the institution, playing an important and ongoing role in informing practice.

With the launch of online learning, UCF created the Center for Distributed Learning as a central resource to support the development and instruction of online courses. Today, CDL has a team of nearly 80 people, including instructional designers, developers, media producers and other professionals who work to advance online learning at the institution.

One factor that has helped UCF invest in its online learning capabilities is a State University System of Florida policy that allows institutions to charge a distance learning fee for online courses. At UCF, this fee is \$18 per online credit hour. Given the volume of online courses, the fee provides nearly enough income for the expenses incurred to operate the CDL.

Faculty Are Key to Online Learning at UCF

Many institutions that scale online learning do so by using adjunct faculty and part-time instructors to teach online sections. This helps to manage instructional costs and maintain flexibility in course offerings and scheduling. Unlike many institutions, UCF does not exclusively hire adjunct professors to teach online courses. Instead, UCF online courses are taught by the same faculty who are teaching face-to-face courses,

AT A GLANCE



UNIVERSITY OF CENTRAL FLORIDA

- Total enrollment of over 66,000, with nearly 57,000 undergraduates and over 9,000 graduate students
- UCF serves a diverse undergraduate population:
 - 55% female, 45% male
 - 48% white
 - 26% Hispanic
 - 11% black/African American
 - 6% Asian
- 31% of first-time freshmen are Pell Grant eligible
- 60% of undergraduate students take at least some courses online, and 14% of undergraduates take all of their courses online

FALL 2017 STATISTICS

including senior faculty. This works to set an example for junior faculty and those who are new to the institution – reinforcing that online learning is core to the institution and core to being UCF faculty.

To ensure quality in online learning, UCF requires comprehensive training programs for anyone building or teaching an online course. For those looking to build a course, the [IDL6543 faculty professional development course](#) is 80 hours over 10 weeks and includes face-to-face and online components, as well as consultations with instructional designers in the CDL. Faculty who are teaching in online environments have 35 hours of training provided by the institution. These trainings recognize that online instruction is more than just taking what faculty know from face-to-face courses and applying it in an online environment.

How Online Learning Can Generate a Return on Investment for Institutions and Learners

In 2018, Arizona State University and Boston Consulting Group released “Making Digital Learning Work,” a report based on over two years of analysis on the return on investment from digital learning in six institutional contexts. The report identifies three components of the return realized from an institution’s investments in digital learning: impacts on student *access* to higher education, impacts on student learning *outcomes*, and impacts on institutional and student *economics*.

Data from UCF points to several potential benefits that can help to drive return on investment, including:

- **Expanding educational access, both overall and for some groups of traditionally underserved students.** Enrollment at UCF has grown from 26,000 students in 1996 to over 66,000 in fall 2017, with much of the growth coming from students taking courses online. In addition, a comparison of the students taking entirely face-to-face courses versus those taking entirely online courses showed that students enrolled only in online courses were more likely to be female, Pell-Grant eligible and older than their peers.
- **Improving student learning outcomes, like time to graduation.** Students who take more courses online at UCF tend to graduate more quickly than those taking more face-to-face courses. For example, students taking 41 to 60 percent of their credit hours online graduate in 3.9 years, compared to 4.3 years for students taking no online classes.
- **Lowering instructional costs per student for the institution and reducing costs for students.** Analysis of per-student credit hour costs at UCF showed that the cost to the institution for online courses was 16 percent lower than the institutional average, primarily due to lower instructional costs. For students, a shorter time to graduation, referenced above, can translate to lower tuition costs and an accelerated path to the workforce.

While not all institutions have similar results from their online learning initiatives, this case study shows how online learning implementation can result in positive return on investment.

