NMC Horizon Project

Scaling Solutions

to Higher Education's Biggest Challenges

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An NMC Horizon Project Strategic Brief

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Introduction

Higher education is ripe for innovation. While emerging technological developments such as digital courseware and mobiles apps have made it easier than ever for people to engage with learning resources, significant issues of access and equity persist among students from low-income, minority, single-parent families, and other disadvantaged groups. The US is currently on track to produce at least 11 million fewer certificates and degrees than our economy will require by 2025.[1] At the same time, nearly half of students who most aspire to filling that need eventually drop out. According to a White House report, half of all people from high-income families earn a bachelor's degree by age 25, as opposed to just one in ten from low-income families.[2]

This publication, Scaling Solutions to Higher Education's Biggest Challenges, aims to identify the challenges obstructing student success and provide exemplars that, if adequately cultivated, can support the widespread adoption of real solutions.

The one-size-fits-all approach of many traditional higher education paradigms is ineffective as it is in stark contrast with an increasingly diverse student population. The National Center for Education Statistics defines non-traditional students by the following characteristics: financially independent for financial aid purposes; having dependents; single parent status; lacking high school diploma; delayed postsecondary enrollment; part-time learners; and full-time workers.[3] Retention of these students is a daunting task for colleges and universities: non-traditional students' first-year attrition rates are more than twice as high as traditional students.[4]

Today, more than 60% of postsecondary students work part- or full-time jobs and 28% have families to support. As such, 37% are enrolled in part-time schooling, with 60% at four-year institutions and 40% at two-year institutions. This cohort of learners is predominantly white at 58%, with black, Hispanic, and Asian-Pacific Islander students comprising 39% collectively. Further, a fast-growing number of college students are between the ages of 22 and 39, and all age groups are increasingly seeking degrees through blended or fully online programs.[5] The challenge facing higher education is catering to all learners' needs, aligning college programs with deeper learning outcomes and the acquisition of 21st century skills that lead to personal goal achievement and gainful employment.

Peeling back the layers of this challenge reveals a web of hurdles that impede the successful scaling of innovative solutions. At "Innovating Higher Education: Moving to Scale," a workshop organized by the New Media Consortium (NMC) as part of the Personalized Learning & Student Success Summit at the SXSWedu conference in March 2016, more than 120 higher education leaders from colleges, universities, educational organizations, and digital learning companies convened to address these obstacles.[6] Ahead of the event, the same group was asked to identify the biggest barriers to the adoption of progressive solutions. From the submissions, 15 significant challenges emerged. Participants who contributed the challenges selected for this session were invited to lead challenge discussions in a round table format. Leaders provided a brief overview of their submitted challenge and how it impacts their institution or organization. Participants then initiated Q&A with the challenge leader, followed by a discussion in which potential solutions were identified and recorded.

To ensure that the student voice remained a paramount consideration in crafting strategies to increase access and equity, the NMC engaged the Young Invincibles (YI), a national youth advocacy group. YI brought a group of college students from low-income communities in the Houston metropolitan area, Austin, and the Rio Grande Valley to act as youth ambassadors in the conversations. The NMC also worked with YI leadership in advance of the event to craft student impact statements that served as a counterpart to the main challenges aimed at institutional

leadership. YI's participation helped ground the discussions in the realities of the challenges facing students today. A summary of the impact of the Personalized Learning & Student Success Summit is below and a full report can be viewed in the NMC publications library.

With the benefit of the challenge discussions being recorded, the NMC engaged in a deep analysis post-event, conducting research and informal interviews with thought leaders. From this work, the NMC ultimately found that 8 of the 15 challenges already had potential solutions in various stages — ranging from frameworks to small-scale pilot programs to government and institutional initiatives. As such, this publication focuses on those 8 challenges with a lens on their implications for access and equity for low-income students and other disadvantaged groups. In addition to providing readers with a brief overview that strives to make the complex challenges easier to digest, each section encompasses a discussion of the solutions, and, wherever possible, includes evidence-based approaches to demonstrate concrete benefits for student success.

"Developing a successful model for collaborative innovation …is the most sorely needed disruption in higher education. More than any particular technological development, improving the way that all technologies and innovations are shared and scaled throughout the sector has the potential to fundamentally change the way colleges and universities serve both students and society."
-University Innovation Alliance

To gain a more holistic view of the issues impacting higher education, the NMC also disseminated a survey to its community of postsecondary administrators, educators, instructional designers, and other key faculty and staff. This survey, which garnered 200 responses, asked participants to share how the challenges were materializing on their campuses, what were the most daunting impediments for solutions, and any other feedback that would help the NMC better understand the nuances, scope, and impact of the challenges. Analytics from the survey as well as direct quotes from respondents are integrated throughout this publication.

By better defining the challenges impeding innovation in US postsecondary education and illuminating high-quality programs and initiatives, it is the NMC's hope that *Scaling Solutions to Higher Education's Biggest Challenges* will catalyze critical discussions, projects, and products that bolster student success, making high-quality learning opportunities more accessible to all. The challenges addressed in this publication, summarized in the infographic that follows, can be categorized as largely relating to faculty needs, institutional culture, and technology-enabled practices and programs — all with an eye toward students as the ultimate beneficiaries of the potential solutions.

This is just the beginning of the discussion; putting these ideas into action to foster systemic change will require a commitment from higher education leaders across the nation to adopt progressive, collaborative, and evidence-based approaches.

Scaling Solutions to Higher Education's Biggest Challenges

This publication aims to identify the challenges obstructing student success and provide exemplars, that if adequately cultivated, can support the widespread adoption of real solutions.

Financial Aid for Competency-Based Education

Leaders are challenged with designing CBE programs that map student progress into traditional credit hour equivalencies so students can qualify for federal financial aid.

Integrating Student Data Across Platforms

Institutions are capturing a deluge of student data that often resides in departmental silos, missing the potential to be a holistic tool that informs decision-making and predictive models.

Scaling Evidence-Based Methods Across Disciplines

Teaching and learning models in one discipline do not always translate to others, and approaches to scaling effective pedagogies too often favor anecdotes over data-driven evidence.

Facilitating Discovery of Learning Technologies

Faculty are motivated to adopt learning technologies when evidence indicates students will benefit but can't always find reputable info about technologies' impact on teaching and learning.

EdTech and Evolving Roles of Faculty

As technology disrupts traditional learning models, some faculty fear that it will diminish their role in learning design and that going digital will drain their time and resources.

Supporting Adjunct Faculty through Tech Deployment

Adjunct faculty often teach introductory and online classes, but institutions do not always provide them with access to the same supporting resources as full-time and tenured faculty.

Innovation Implementation Learning Curves

Robust professional development strategies are needed to increase the self-efficacy of faculty, instructors, and students to ensure that technology deployments go smoothly.

Sustaining Innovation through Leadership Changes

Initiatives can lose momentum when stakeholders leave their positions midstream, challenging institutions to sustain progress on promising innovations in the face of changing governance.

Financial Aid for Competency-Based Education

Competency-based education, which allows students to receive credit for and build on real-world skills more efficiently than the conventional semester system, provides a flexible and affordable solution for student success. Current evidence supports claims that these programs increase access to postsecondary credentials at more affordable costs for low-income and minority students.[7] However, institutions are challenged with designing programs that map student progress into traditional credit hour equivalencies so students can qualify for federal financial aid.[8] Multiple US organizations are collaborating to build solutions that create infrastructure and support for this accelerated college completion model.[9]

Overview

The traditional, time-based model of higher education is no longer the only viable option to obtain a degree. Thanks to the rapid advancement of technology and its adoption in higher education, alternative learning opportunities for students are on the rise. The first wave of alternative learning came in the form of online course delivery, where students could attend class from any location.[10] Currently, higher education is moving into the second wave, using the burgeoning model of competency-based education (CBE), also known as competency-based learning. In this approach, rather than requiring students to engage in a set number of instructional hours, credits are awarded upon demonstration of particular proficiencies. This self-paced model of teaching and learning transfers control over the time spent learning to the student; every time a competency is mastered, it adds to their growing portfolio of transferable skills.[11]

Until recently, many institutions were discouraged from adopting this model due to strict regulations set forth by the US Department of Education that barred CBE programs from applying for financial assistance. This translated into restrictions that banned students from using federal aid dollars on these types of programs, even though CBE has potential to lower the time, and therefore cost, spent obtaining a degree. Two of the most noted issues stem from CBE's lack of accreditation status and its inability to translate credits into seat time, both of which are mandates to be eligible to receive any financial support from the US government.[12] As of January 2015, only four institutions offering CBE degrees were eligible for federal funding.[13] Evidence of CBE's efficacy from the success of institutions such as Western Governors University[14] led members of the US House of Representatives to unanimously pass H.R. 3136, the Advancing Competency-Based Education Demonstration Project Act of 2014.[15] While the US Senate has yet to take up the bill, the US Department of Education has selected 40 universities as participants in an experimental study granting waivers for these institutions to receive federal funding for CBE programs; to date, the project is still ongoing.[16]

Although efforts are underway to clarify the rules for the use of financial aid for CBE programs, recent news headlines highlight the confusion around the current governing guidelines. Following the US Department of Education's ban from enrolling any new students on financial aid, ITT Technical Institute announced in September 2016 that they would be shutting down all campuses across the US, leaving behind thousands of degree-seeking students and millions of dollars in federally-backed debt. While ITT Tech blamed the closure on the regulations, the Department of Education defended its stance, citing the high financial risk to both students' and taxpayers' funds had the program continued.[17] These kinds of headlines underscore the need for universities and the federal government to work together to solve the challenge of developing funding mechanisms for alternative learning programs.

Implications for Access and Equity

Flexibility has been a driving force behind the growth of alternative learning opportunities, making postsecondary education attainable for a larger, more diverse group of students. Online learning

inverted the established in-person delivery model by bringing the classroom to students anywhere and enabling asynchronous learning. Today, most CBE programs take advantage of the accessibility of online learning while also decreasing tuition costs. Students with prior work experience can obtain credits in those proficiencies in a shorter time span than the traditional semester program. This feature of CBE is known as the subscription model, where a student pays a flat rate and is encouraged to complete as many credits as possible within a given timeframe. For example, Southern New Hampshire University's College for America subscription model charges students $2,500 for two six-month semesters, a significant financial savings as compared to the national average tuition, which runs over $6,000 per year for public universities.[18] The cost-effective nature of the program is instrumental when considering the financial hurdles posed by traditional higher education; in the US, students of higher socioeconomic status are eight times more likely to complete a bachelor's degree than low-income students.[19]

"These students will be naturally drawn to institutions that are able to offer them the best value, quickly."
-Director of IT, Community College

CBE-focused institutions are leveraging both lowered costs and higher accessibility in an effort to attract more students from minority and underserved populations. These efforts have mixed results: according to a study published in *The Journal of Competency-Based Education*, African-American students account for 20% of enrollments at CBE institutions, while numbering 15% at universities, but many CBE programs enroll a disproportionately lower number of Asian and Hispanic learners.[20] The flexibility of CBE programs can also meet the needs of nontraditional students, such as part-time and full-time workers; large corporations have begun collaborating with CBE programs in order to further their employees' professional development. For example, Anthem, one of the country's largest health insurers, recently partnered with College for America to pilot a workforce-applicable degree program, which kicked off in 2015 with a record 51,000 new student enrollments.[21]

Change to traditional structures is often met with skepticism — some of it warranted and some grounded in fear. The narrative surrounding new methods of teaching and learning becomes increasingly integral to their success. While support for CBE from institutions, foundations, and the US Department of Education has created great strides in the programs and their funding strategies, critics still question the legitimacy of these degrees. There is debate over whether these degrees will further the hierarchical gap between those able to afford a traditional education and those who must partake in "cheap, fast food-style" programs.[22] This rhetoric could be detrimental to the adoption of this alternative learning method into institutions. The importance of this approach's ability to increase access needs to be regarded as equally valid in order to increase equity.

In fact, work is already underway that demonstrates the US Department of Education's continued investment and experimentation in alternative credentialing methods. The Educational Quality through Innovation Partnerships (EQUIP) program partners eight higher education institutions and non-traditional providers, and plans to provide financial aid to low-income students to enroll in these programs. The prospective outcomes are twofold: first, to grant financial aid to more Americans that currently do not qualify and therefore promote participation in these innovative, alternative learning methods; and second, to strengthen these approaches to ensure continued success and sustainability.[23]

Potential Solutions

Exemplar institutions have led the charge in creating more strategies that demonstrate progress towards degree completion and apply federal financial aid towards tuition costs. For example, one of the biggest advocates for CBE is the University of Wisconsin (UW), who developed individual student learner profiles that create benchmarks to map student progress and monitoring systems to ensure

financial aid reflects the student's pace.[24] Additionally, Western Governors University (WGU) has been a fully operational CBE institution for over a decade. With 76% of students receiving some form of financial aid, WGU has extensive information on how to apply for federal financial assistance on the home page of their website.[25]

Texas A&M University-Commerce is using CBE to attract students who have amassed some college credits, but do not yet have a degree. Born under the TAB (Texas Affordable Baccalaureate) initiative, this program is using enrollment data and predictive analytics to track degree completion throughout different groups of learners. In doing so, they have discovered that those enrolled in their CBE program have broken the historically persistent pattern of transfer students not graduating upon returning to school. Instead, the majority of these students are graduating within a year of starting the program at an average cost of $4,250 in tuition, which is a fraction of the price at a traditional program.[26] These statistics highlight the need to develop more alternative learning opportunities in order to reach a broader student population, and add to CBE's growing list of qualities that make it an undeniable resource to meet these needs.

Efforts are still underway to build upon the momentum CBE programs have gained within the past few years. Leaders of this movement are hopeful that current government initiatives will create strategies for both institutions that offer CBE exclusively, as well as for colleges and universities that are implementing the model within their own frameworks to gain access to federal financial aid. To date, extensive CBE guides have been published in multiple editions, equipping institutions with the most accurate, up-to-date information to encourage applications for programs that support this model.[27] The Competency-Based Education Network (C-BEN), a group of colleges and universities that work to address challenges and scale solutions to improve CBE programs, is supported by a grant from Lumina Foundation. The institutions aim to develop evidence-based approaches that deliver competency-based learning to a wide range of student populations.[28] The Reimagining Aid Design and Delivery (RADD) program has also leveraged multiple organizations' research to produce a series of reports underscoring the challenges in the current financial aid system and surfacing ways to restructure the system to provide more aid to low-income students.[29, 30]

Key Takeaways: Financial Aid for Competency-Based Education

- Competency-based education (CBE) models recognize learner proficiencies to allow advancement without a time-based requirement.
- By lowering the cost of postsecondary credentials, CBE has potential to increase higher education access for low-income and other underserved student populations.
- Institutions offering competency-based learning opportunities are using learner profiles to meet federal financial aid requirements of translating credits into seat time; research efforts are underway to develop additional strategies.

Integrating Student Data Across Platforms

The growing use of data mining software in online education is fostering learning environments that leverage analytics and visualizations to portray learning data in a multidimensional and portable manner. In online and blended courses, data can reveal how student actions contribute to their progress and specific learning gains. These technologies, enhanced by predictive analytics, have great potential to support student success by identifying and reaching out to struggling students[31] and streamlining the path to graduation.[32] As institutions implement learning management systems, degree planning technologies, early alert systems, and tutor scheduling that promote increased interactions among students, faculty, and advising staff, there is a need for centralized aggregation of these data to provide students with holistic support that improves learning outcomes. This can be a challenge for institutions that are using a variety of technology systems that are not integrated with each other. Further, while colleges and universities are capturing a deluge of student data, often this information sits in divisional and departmental silos, falling short of informing comprehensive decision-making and creating predictive models.[33]

Overview

The *Gallup-Purdue Index 2015 Report*, which surveyed more than 30,000 college alumni, found that only 38% of recent graduates strongly agree that their higher education was worth the cost.[34] As evaluation of higher education funding and success initiatives shifts from enrollment numbers to attainment and outcome-based models, institutions are subject to greater pressures to create services that support students, helping them graduate on time and find gainful employment.[35] Integrating data gathering mechanisms to merge various datasets and share them across departments can provide a clearer picture of student performance while illuminating gaps and needs. This is particularly helpful for campus student advising services, which rely on data to provide targeted interventions and help learners chart their degree plans.

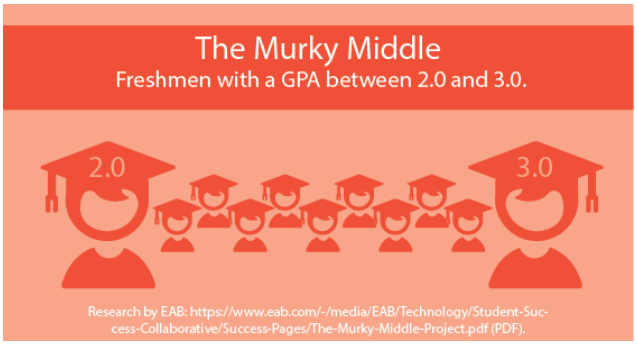
"Not all vendors provide easy access to data, and it's not always easy to aggregate the data in a way that is meaningful to students or faculty."
-Instructional Technology Specialist, Public Four-Year Institution

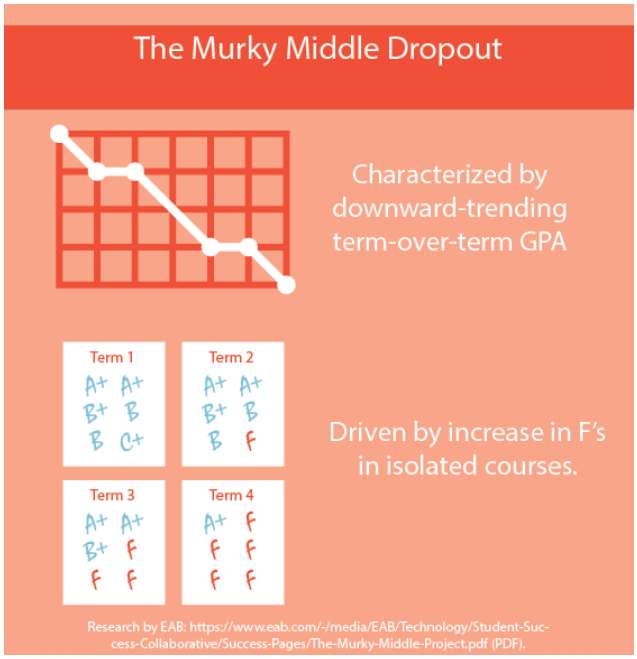
The 2016 EDUCAUSE "Top 10 IT Issues" brief identifies student success technologies as three categories of analysis tools that leverage institutionally-collected data to forecast student success, identify risks, trigger interventions, show pathways for improvement, and collect assessment data on student performance. Their research reveals that 66% of institutions are currently developing some form of these technologies;[36] however, many systems are still underdeveloped due to technical and analytical capacity, institutional culture related to the role of the technology, and questions of ethics and responsibility tied to access and use of student data.[37] Further, a number of current institutional analytical initiatives are occurring without cross-campus coordination, creating duplicative work.[38] Indeed, colleges and universities are struggling with the different information silos across their campuses, identifying how data should be integrated and by whom, and devising processes to harness data for timely student feedback and intervention.[39]

NMC survey respondents cited inadequate leadership, policies, and budget as the largest barriers to improving data systems and feedback loops. In many current data initiatives, users are required to move between systems and correlate the data themselves, increasing the burden for faculty members or advisors working to support students. Addressing these challenges will require clear policies and leadership around data storage, use, and management; coordination within and across institutions and the third-party data technology vendors; and enhanced technological infrastructure.[40]

Implications for Access and Equity

The ultimate goal of data-driven approaches is to move beyond simply identifying student persistence risk factors to build better pedagogies and advising programs — factors that will positively influence student success.[41] While direct outreach to at-risk students is not a new idea,[42] predictive analytics and student data access are informing and enhancing the intervention process. Unfortunately, the current ratio of advisors per student across US campuses is less than favorable, with public institutions such as Central Michigan University (CMU) reporting that there is one advisor for every 1,200 students. Only 20.6% of CMU's new freshmen graduate within four years, and 48% within five years.[43] As institutions need more help to guide students to completion, data technologies have the potential to fill in gaps and provide advising staff with instant windows into progress and pain points. NMC survey respondents believe that this data should be used in service of providing more support to assisting low-income and first-generation college students in their first two years as well as community college transfer students. An initiative currently underway from Predictive Analytics Reporting (PAR) Framework aims to predict a community college student's success at a four-year institution based on their college records with the goal of creating a better transfer experience.[44]





Indeed, much discussion around the challenge of student attrition focuses on freshmen because 47.7% of all dropouts occur within the first year.[45] Current data shows that more than half of student attrition can be attributed to "Murky Middle" students — freshmen with a GPA between 2.0 and 3.0.[46] A recent study by EAB (Education Advisory Board), using data from more than 50 institutions and 10 years of records, found only 43% of full-time students who have a first-year GPA between 2.0 and 3.0 go on to graduate.[47] Because they are not categorized as at-risk, these learners are commonly overlooked by student support services. For these students in the middle, a declining GPA over time results in a greater attrition rate later in a student's career. While this is not a surprising finding, EAB asserts that the ability to apply predictive analytics to current students could help institutions identify attrition risks sooner, allowing interventions to take place early enough so students can still recover.[48]

Further, societal and economic factors are redefining what skills are necessary in today's workforce, so colleges and universities must rethink how to define, measure, and demonstrate subject mastery in ways where students understand their strengths and weaknesses. NMC survey respondents advocated for keeping the data open and teaching students how to analyze it and address their own findings. When designing integrated student data systems and revealing that data in accessible ways (e.g., visualizations and dashboards), institutions consider how students can ultimately benefit from greater self-awareness, empowering them to make smarter choices for their future.

Potential Solutions

One highly successful example of data integration is Georgia State University's (GSU) revamped university-wide advising program, Graduation and Progression Success (GPS). The majority of GSU's students fall into traditional at-risk categories and the ratio of students to academic advisors was 700 to 1, making it difficult for them to regularly interact with all students needing support.[49] In 2012, GSU reviewed ten years of data and identified 800 academic "mistakes," such as registering for the wrong lab sequence, a class not in major, or low math scores for students whose major requires calculus. Leveraging this data and the EAB platform, each time one of these mistakes occurs for any GSU student, the system flags that mistake and an advisor contacts that student within 48 hours.[50] In 2015, use of this system resulted in 43,000 one-on-one student meetings.[51] The GPS initiative, in combination with other activities at the university, has greatly impacted student success, showing an increase in the six-year graduation rate from 32% in 2003 to 54% in 2014.[52]

GSU and their partners are growing and refining this technology with the development of two projects, both aimed to scale the effective model at other institutions. The 2016 merger of Georgia State University and Georgia Perimeter College led to the opportunity to build a central cross-institutional system to foster successful transfer pathways.[53] GSU has also partnered with the University Innovation Alliance on an $8.9 million grant from the US Department of Education for a multiyear research project to expand Georgia State University's success to 11 other universities.[54]

There is a growing consensus throughout postsecondary education on the necessity and utility of data collection and analysis strategies. Without a strategic plan for the collection, organization, evaluation, and dissemination of collected data, efforts could ultimately be hurting students because sharing inaccurate or overly-generalized data could lead to misguided decision-making.[55] Developing a clear set of attainable goals with a shared understanding of exactly what metrics and information institutions are trying to glean is vital.[56] In response to this challenge, more colleges and universities are hiring Chief Data Officers (CDO). This emerging position serves as the central leadership for all data activities, from collection to prompting action based on analysis,[57] moving beyond strategy development to operationalizing and addressing the technical concerns of the plan.[58]

Institutional cooperation and coordination is another key factor for success. Leaders in predictive analytics emphasize the importance of communication across institutional silos, carefully addressing and understanding apprehension when requesting new data.[59] Projects such as Georgia State University's collaboration with University Innovation Alliance will add to the body of research aimed at understanding at-risk student needs and devising successful intervention actions beyond a single campus community.[60] US higher education leaders are also beginning to look internationally for examples of effective cross-institutional cooperation. A notable example stems from the UK, where institutions are collaborating at the national level through Jisc's learning analytics initiative. To date, over 50 institutions have been identified to pilot the program, which aims to define and implement a national open architecture for learning analytics.[61]

Institutions must also put into place technology infrastructures that connect student success technologies. Shifting from purpose-driven tools to enterprise-wide solutions and investing in middleware technology that consolidates data from disparate systems are potential infrastructure strategies. The Tin Can API (also known as xAPI) and the Caliper Analytics Framework, for example, are two distinct tools that gather data in a consistent manner from multiple systems. Until recently, institutions have implemented these tools separately, but at a recent IMS Global Learning Consortium meeting, leaders from both organizations gathered to discuss the future of a unified path that will enable the opportunity to work more cohesively and create a product to complement each other's current efforts.[62]

Key Takeaways: Integrating Student Data Across Platforms

- Data from online learning environments' learning management systems can help students understand their strengths and plan for graduation and beyond, but institutions are challenged to merge data sets in usable ways.
- Students in the "murky middle" (2.0-3.0 GPAs) stand to benefit from early academic interventions made possible by integrated student data and predictive analytics.
- Institutions are implementing technologies to extract and consolidate data from disparate systems; further, Chief Data Officers are fostering leadership efforts, technical oversight, and strategic planning related to student data collection and usage.

Scaling Evidence-Based Methods Across Disciplines

Evidence-based methods for learning refer to instructional practices that have fostered improved learning outcomes, as demonstrated in controlled trials and pilots.[63] Metrics and analytics that reflect greater student retention and performance across an entire course, program, or undergraduate division can illuminate the efficacy and obstacles of specific pedagogical and technological implementations. However, institutions are challenged with scaling their successful practices as the process and evaluation of teaching and learning in one discipline does not always translate to others. Current approaches to scaling effective pedagogies are too often based on anecdotal evidence, when one success story is amplified with the assumption that it can be simply applied in other learning contexts. Compounding this challenge is the notion that scaling is not synonymous with mere duplication: identifying ways to adapt teaching and learning practices for different learners, course levels, program types, and institutional settings requires analysis of the evidence followed by deep thinking around making appropriate modifications for other courses. Additionally, many instructional methods are grounded in habit — educators and leaders may grow complacent as cultivating real change can be a time-consuming, confusing, and expensive process.[64]

Overview

A barrier for scaling innovative teaching and learning practices is changing the behavior of faculty and staff who are accustomed to engaging in course design and instruction based on anecdotes, habit, and subjective student feedback. Joining the evidence-based learning movement requires a growth mindset embedded at every level of the higher education system. Agile campus cultures that encourage pedagogical and technological experimentation are fertile grounds for scaling novel approaches.[65] Studies of innovations and documenting the significant impact on student success are essential milestones, but all too often the diffusion of the innovation halts when the initial program ends.[66] Unfortunately, more than 66% of NMC survey respondents ranked university and college leadership as the thorniest area of this challenge as faculty lack critical support to advance new teaching and learning practices. Scaling innovative teaching and learning practices requires resources and incentives, yet pedagogical efforts are seldom incorporated in tenure review.

"Emphasis is placed on enrollments rather than on quality instruction and learning. Unless there is a change in emphasis, underserved communities will continue to be underserved by low-quality education."
-Former Vice Dean, Four-Year Private University

Additionally, the absence of communities of practice and guides for scaling evidence-based models were cited by survey respondents as major obstacles. Scaling evidence-based innovations across institutions and cross-institutionally demands that faculty are constantly communicating with colleagues in other disciplines, and possibly other institutions, so they can define together what success looks like and co-design pilot programs and new approaches. In this sense, the perception of university and college departments as silos is outdated and dangerous. Collaborating on pilot programs and sharing the resulting data is vital to achieving a holistic view of student success. UNESCO recently tapped the Associate Vice President of Teaching and Learning at the University of Hong Kong to define key steps for scaling evidence-based approaches. Recommendations included ensuring that educators and other institutional stakeholders are part of a close-knit community where they are empowered to envision and implement a new culture of teaching and learning.[67]

Implications for Access and Equity

Helping faculty understand the importance of evidence-based approaches is a significant part of this challenge, but ultimately it is the students that stand to gain or lose from them. Learners need to have a clear understanding of how innovative solutions such as competency-based education, adaptive learning, and other digital learning approaches will contribute to their goals in their program and

beyond; institutions have a responsibility to crystalize the connection between a program and long-term success.[68] Particularly for low-income students who view college as a means to find gainful employment efficiently and affordably, programs that do not prioritize evidence of positive student outcomes can prevent them from achieving their goals. Simply put, scaling high-quality instruction must be a priority.

When an emerging learning model gains traction at one institution, it is crucial for evidence and effective practices to be shared widely. Nonprofit organization Jobs for the Future convened educators, policymakers, and researchers from across the US to explore how competency-based education can better aid unprepared adult learners. They published a paper detailing their initial findings, which revealed that innovative learning programs most often serve students who are already well-prepared for college, alienating low-income and first-generation students. Not only are underrepresented students in need of remediation, but they also often lack college knowledge and appropriate student supports. Currently, only 50 US postsecondary institutions offer CBE programs and most take place online. Unprepared students, categorized as needing remediation in at least one subject before doing college-level work, often lack a clear picture of the career landscape and training programs.[69]

With positive evidence of student skill acquisition and employment across many disciplines at institutions such as Western Governors University[70] and College for America at Southern New Hampshire University,[71] nearly 600 institutions are now exploring CBE as an approach to support learner success.[72] However, even in light of early studies, there is not yet a large body of evidence that definitively proves that CBE is effective for low-income and minority learners. The onus is on institutions to collect data on their CBE programs, make sense of it, and disseminate the results as broadly as possible to build better programs.

Potential Solutions

An interview with Tanya Joosten, Development Co-Director of the National Research Center for Distance Education and Technological Advancements (DETA) at University of Wisconsin-Milwaukee,[73] illuminated strategies for scaling learning models. Joosten emphasizes the need to identify instructional and learning practices that are proven to work through empirical research. One pathway is through the analyses of meaningful data across programs and institutions. DETA is determining measures that influence success by merging data from multiple data sources, including student data from institutionally warehoused systems (e.g., student demographics, grades, and completion), student survey data (e.g., engagement, social presence, and learning community), and instructional platform data illustrating faculty and student behaviors (frequency and duration of instructional and learning activities). With the benefit of the full picture of learner background, behaviors, perceptions, and outcomes, institutional leaders can better understand critical factors that comprise student success. Achieving this vision means that leadership and faculty must support open data-sharing.

The US Department of Education is prioritizing the resolution of this challenge through their Institute of Education Sciences, funding education and research grant programs that call for scalable strategies to support the college completion network. The aim is to evaluate the impacts and determine the costs of broad interventions that can better support degree attainment and convene education leaders, policymakers, and practitioners around advancing new approaches, developing an effective communication strategy.[74] In practice, Carnegie Mellon University (CMU) is setting the standard for evolving online learning practices at scale.[75] Their Open Learning Initiative encompasses "Teach with OLI," a program that helps educators target student misunderstandings during classes.[76] Chief among the goals of this program is to support better learning and instruction with high-quality, scientifically-based, classroom-tested online courses. OLI provides flexible learning materials, developed based on leading-edge research and learning science, that can be leveraged for various courses.[77]

Broad efforts are underway to help institutions reimagine postsecondary teaching and learning to incorporate educational technology that is backed by rigorous evidence and research. From 2013 to 2015, through the Adaptive Learning Market Acceleration Program (ALMAP), 14 institutions implemented adaptive learning technologies into their courses to improve learning outcomes for low-income students that would translate into higher rates of degree completion.[78] SRI Education recently published a report highlighting the lessons learned from the ALMAP initiative; to improve adaptive learning technology deployment, they proposed that more evidence must be gathered to discern effective protocols that lead to student success.[79] Evidence is also mounting that use of open educational resources (OER), which are educational materials published under an open license to encourage others to use, modify, and recirculate for public consumption,[80] not only dramatically reduces costs, it can also positively impact student performance. For example, Northern Virginia Community College (NVCC) piloted an OER degree initiative that resulted in a 9% pass rate increase compared to traditional classes. Achieving the Dream's Open Educational Resources (OER) Degree Initiative aims to scale the success of NVCC and other piloting institutions' improved student outcomes through the implementation of OER materials. Thirty-eight community colleges will replace physical textbooks with freely accessible OER materials through the initiative.[81]

Researchers at North Carolina State University (NCSU) recently published an article that introduced the Student-Centered Active Learning Environment with Upside-down Pedagogies (SCALE-UP) Project to diffuse research-based instructional strategies designed to foster greater student interaction and activity-based learning. While it was piloted in high-enrollment university physics courses at NCSU, it has since been adopted in more than a dozen disciplines and 189 institutions. Participating faculty attribute the success of SCALE-UP to their ability to leverage interpersonal networks and appeal to a broad range of faculty — not just early adopters.[82]

Key Takeaways: Scaling Evidenced-Based Methods Across Disciplines

- Innovative pedagogies do not advance beyond pilots or achieve implementation outside of a single department because educators lack institutional support incentives to deploy effective models.
- Across departments and institutions, communities of practice and resources that promote sharing of both successes and failures will be vital to addressing this challenge.
- Research efforts that harness comprehensive student data can uncover useful models and help educators understand which aspects of teaching and learning contribute to student success.

Facilitating Discovery of Learning Technologies

In the growing field of adaptive learning, many solutions promise to increase student success. Faculty may be motivated to adopt learning technologies when evidence indicates that students will benefit, but they cannot always find reputable information about technologies' impact on teaching and learning.[83] Even multiple studies of a single tool can yield varying results due to differences in research conditions such as learner populations and technical implementation support.[84] In response to this challenge, leaders have created resources that compile digital learning technology reviews, efficacy research, and student impact data in searchable formats. While these tools and communities of practice represent first steps to aid institutional decision-makers, technology discovery and selection remain a complex web of considerations including factors such as tool interoperability, affordability, and the pedagogical needs of learners.

Overview

Faculty who are interested in adopting learning technologies seek not only a functional and enjoyable user experience, but also the capability to enhance their pedagogies and impact student learning.[85] In a 2015 survey of higher education CIOs and senior IT personnel by the Campus Computing Project, 96% agreed that adaptive learning technologies hold promise for increasing students' outcomes. Between solution development and classroom deployment, however, educators are challenged to sift through a growing number of digital learning tools to find those that meet their needs. The Campus Computing Project survey further found that a mere 4% of their institutions' developmental and general education courses are implementing these technologies.[86] A lack of processes to inform technology procurement can slow the scaling of solutions with potential to impact the field. When faculty learn about technologies through their own research or personal learning networks, several considerations remain before a product can be deemed suitable for adoption, such as interoperability with existing campus infrastructure.[87]

"Faculty are unaware of the great numbers of digital courseware available."
-Associate Director, Public Four-Year Institution

Many institutions have intricate bureaucratic processes for learning technology procurement that can create high barriers to entry,[88] while financial pressures can leave administrators reluctant to invest in innovative solutions. Additionally, return on investment can be difficult to measure when institutions adopt educational technologies for student success initiatives.[89] Another facet of this challenge is that the development of digital and personalized learning technologies is largely being steered by suppliers, while institutions are still identifying their demand. Major textbook publishing companies are shifting focus to smart products that play an active role in students' learning. McGraw-Hill Education, which has rebranded as a learning science company, offers ALEKS, an online math learning system that harnesses artificial intelligence to engage students through adaptive pathways, while Pearson's REVEL provides interactive digital course materials designed to improve content mastery.[90] However, for smaller companies without well-established presences on college and university campuses, it can be difficult to break into the higher education market.[91]

George Siemens, a leader in the field of learning analytics, has expressed concern that when making purchase decisions on adaptive technologies, institutions lack the necessary knowledge on product efficacy and content relevance.[92] Initiatives aimed at moving adaptive learning into greater adoption reveal that guidance on technology selection is also needed. The Association of Public and Land-grant Universities has recently awarded grants to seven public research universities to implement adaptive courseware.[93] Grantee institutions were provided a list of over 20 approved vendors whose products contain adaptive capabilities, encompass multiple disciplines, and have achieved scale beyond the pilot stage; results of the grant activities will inform subsequent lists.[94]

Implications for Access and Equity

In the absence of more technologically-advanced options, the high cost of traditional print texts can leave financially-strapped students with difficult choices. A survey conducted by the US Public Interest Research Group revealed that 65% of students have opted not to purchase a textbook, even as they feared their decision would negatively impact their classroom achievement.[95] The timing of financial aid awards can also impact students' ability to timely acquire course materials. Institutions such as the University of Central Florida are addressing this gap with programs that provide students a small advance on their stipends.[96]

Researchers from SRI Education have found that adaptive technologies incorporated in a blended learning environment can positively impact low-income students' outcomes.[97] Learning technologies provide a more affordable, equitable alternative to print textbooks. Students are able to view course materials from any location with an internet connection.[98] NMC survey respondents noted, however, that students who do not have regular access to digital devices are not privy to these advantages. Comcast is piloting an initiative in Colorado and Illinois in which community college students receiving Pell grants are eligible to purchase computers for less than $150.[99] Programs of this nature recognize the growing importance of access to digital resources and technologies for postsecondary students.

Digital learning products not only cost less than printed textbooks, but they also offer more than static material: many incorporate content mastery approaches backed by learning science.[100] In *Learning to Adapt 2.0: The Evolution of Adaptive Learning in Higher Education*, Tyton Partners reports that adaptive technologies provide students with information about their own learning, as well as allowing faculty to access data that enables more individualized, targeted assistance.[101] Students often struggle in high-enrollment, general education classes that they must complete in order to advance in degree tracks: just half of students enrolled in college algebra receive a passing grade of C or above.[102] The personalization afforded by digital learning technologies can help more students succeed in these introductory courses, avoiding the expense and delay of retaking classes that could lead to financial hardship or dropout.[103] By taking steps to investigate and implement educational technologies that have been shown to improve student outcomes, institutions can provide learners with more support and flexibility.

Potential Solutions

Efforts are underway to help educators identify effective digital learning products. The University of North Carolina (UNC) System has launched the Learning Technology Commons, a catalog of learning technologies intended to make procurement easier for its network of 20,000 faculty members across 17 campuses.[104] The Commons marketplace allows faculty and staff to log in with institutional credentials and contribute product reviews, creating an aggregation of crowdsourced user experiences similar to Yelp or TripAdvisor. Any technology developer can apply for inclusion into the Commons; approved tools meet UNC's guidelines for student privacy protection as well as other relevant laws and regulations, and will disclose pricing structures. The goal of the Commons is to expedite educational technology purchasing for its faculty and to help educators connect with each other, enabling informed decisions grounded in real classroom experiences.[105]

The Courseware in Context Framework, an open access resource created by Tyton Partners and the Online Learning Consortium, aims to support institutional decision-makers in selecting digital learning solutions. Educators, administrators, and instructional designers can access a product taxonomy that categorizes technologies by features such as technical compatibility or use of socio-emotional interventions.[106] Users can also discover peer-reviewed research on how product features impact student learning, as well as guides to inform implementation at the course and institutional levels.[107] The framework is designed to help users choose the product that will have greatest impact on

improving student outcomes in the context of their institutions' teaching and learning needs. Additionally, EdSurge has introduced a companion site, the Digital Learning Network (DLN), intended to catalyze a community of practice centered around key opportunities to improve student outcomes with digital learning practices and digital courseware. Encompassed within the DLN are news stories, practitioner interviews, and an annotated learning technology index that contains institutional case studies as well as product pricing and interoperability data. EdSurge is hosting a monthly Tweet-Up using hashtag #DLNChat, in tandem with other digital and face-to-face networking events for innovative educators to learn from each other's experiences.[108]

Key Takeaways: Facilitating Discovery of Learning Technologies

- When selecting learning technologies, institutions and faculty often lack access to critical information about products' utility and relevance.
- Adaptive technologies have improved outcomes for low-income students and helped them understand their own learning, while open access and digital learning resources are poised to improve affordability in higher education.
- Online resources that aggregate user reviews, efficacy studies, and interoperability standards can help educators find technologies that meet their needs; digital learning networks can also connect innovators across institutions.

EdTech and Evolving Roles of Faculty

Advances in educational technology are altering delivery methods of course materials as well as student interactions with the content and their instructors. As adaptive technology platforms and advancements in online learning tools disrupt traditional learning models, some faculty perceive the changes as a paradigm shift that diminishes their role in designing the learning experience. Educators who are already strapped for time and resources often struggle to convert their traditional lesson plans to encompass emerging technologies such as digital courseware. However, a number of institutional initiatives are revealing that faculty engagement with these tools may play a significant role in student success by helping faculty better manage time and providing them with a more comprehensive perspective of student progress. These tools are freeing up faculty to undertake deeper roles as mentors, guiding students through active learning exercises instead of dispensing information in lecture formats.

Overview

Some faculty worry that automated technologies such as adaptive and online learning platforms threaten the rapport between students and educators fostered by in-person instruction; however, research shows that one of the keys to successful use of these tools is meaningful interaction between students and the instructor.[109] Thought leaders have posited that learning technologies should be assistive — not merely supplanting the relationship between the student and the educator.[110] Further supporting this reasoning, a recent Ithaka S+R series of case studies found that how a tool is used ultimately determines whether it will lead to improved learning outcomes. The studies reported that "in courses with the highest reported levels of engagement, instructors used tools creatively, thought deeply about how tools supported their pedagogical goals, and had support from instructional designers, IT staff, administrators, and other faculty members."[111]

"Faculty are starting to think about how online resources and managing students' work outside of class can make the classroom time more engaging."
-Chair, Humanities & Fine Arts, Community College

Additionally, many faculty believe that new educational technologies and alternative approaches including blended or fully online models cannot provide the same educational quality as the traditional face-to-face model.[112] For education leaders, mandating changes without evaluation of the curricular needs can be counterproductive and harmful. Elements that can increase success of institutional technology deployments include approaching adoption of educational tools from a change management perspective; allowing for meaningful faculty participation and discussion; using and evaluating instructor concerns to improve an institution's plan; and clearly communicating the mission and strategy to all faculty.[113] In this sense, faculty become co-designers of technology deployments, gaining a better understanding of potential uses and benefits and taking ownership of the process.

Implications for Access and Equity

Research on the success of community college students as based on records from 14 institutions across the US that participate in the PAR Framework collaborative suggests that online courses may provide access to higher education for low-income or disadvantaged learners.[114] Adding monitoring and intervention services through adaptive technologies that support the instructor in understanding and interacting with students may be key to maximizing student success in online and blended offerings. At Strayer University, administrators are finding that tracking student behavior at the beginning of the term provides faculty insight into who is likely to succeed and who needs more attention. The university is experimenting with faculty members and coaches reaching out to students with low levels of engagement, and has found that the faculty interventions resulted in a 12% rise in students who passed the course as well as an 8% decrease in those who dropped the course.[115]

At-risk students can benefit from more personalized delivery of materials and instruction along with timely feedback,[116] and adaptive learning platforms may help scale these methods to keep students engaged in their learning experience.[117] For example, at Arizona State University (ASU), the Global Freshman Academy leverages detailed profiles of student progress that both students and professors use to map out their personalized education pathways, along with a computer-based tutoring system that provides continual feedback. When a student experiences difficulty, tips and resources are automatically generated; for further assistance, the student can also connect with the ASU coaching team at the click of a button. The university is finding that using these tools is increasing both pass rates and engagement levels.[118]

Potential Solutions

Change that calls for experimentation and risk on a professional level requires a supportive and collaborative institutional culture.[119] This sentiment was also echoed by NMC survey respondents: practitioners identified collaboration, training, and incentive as areas where institutional support can lead to increased program success. A number of institutions offer dedicated programs and services to support faculty in experimenting with and implementing digital technologies. For example, Clemson University's Center of Excellence has developed a Digital Creativity Faculty Program and is exploring a support-and-incentive program targeting departments that are currently less engaged with the resources. They have invested in numerous production technologies including a green screen studio with a one-button video recording system, a high-end audio recording station, and access to the full suite of Adobe Creative Cloud apps.[120] The University of Michigan's Digital Innovation Greenhouse is another initiative that supports faculty experimentation and collaboration by bringing together cross-disciplinary researchers and developers in scaling innovations that are continually tested and refined through campus user groups.[121]

Other institutions are collaborating across campus lines and engaging external support to incorporate digital resources and new modes of content delivery. The University Innovation Alliance is a cohort of 11 universities experimenting with predictive analytics, intensive advising, and other strategies to help students from all backgrounds graduate; their goal is to find what works and help other institutions scale these innovations.[122] A number of institutions and organizations are creating a culture of support by contributing to a growing body of open resources, research, and best practices that any instructor can access, learn from, and incorporate into practice.

Since 2013, Tidewater Community College (TCC) has utilized open educational resources (OER) in its courses. Through TCC's Z-Degree program, students can earn an associate's degree in business administration without purchasing a single textbook; estimates show that these savings could total $1,400 a year for students. The initiative utilizes the Candela platform from Lumen Learning, a start-up that aims to reduce costs and support student success through the use of OER. In 2015, TCC began piloting courses on Lumen's Waymaker system, which delivers OER content supplemented by personalized learning tools designed to increase student-instructor interactions and help students understand their own learning. While TCC is still in the process of analyzing the pilot's results,

promising responses from faculty and students support the continued use of these platforms and OER.[123] Internal and cross-institutional collaboration, access to new tools and practices, and supporting faculty experimentation will continue to evolve the role of faculty and allow them to more effectively serve each student.

Key Takeaways: EdTech and Evolving Roles of Faculty

- Institutions should involve faculty in decision-making to increase their sense of ownership and help them understand how to use new tools to enhance their pedagogies.
- Tools that facilitate increased interaction between instructors and students are improving pass rates and engagement levels. Online and blended courses offer these affordances to meet the needs of disadvantaged learners.
- Multi-institution coalitions aimed at scaling best practices and individual institutions' development of open resources are helping faculty understand how to leverage digital technologies in the classroom.

Supporting Adjunct Faculty through Tech Deployment

Blended learning environments that harness adaptive learning technologies have proven to enhance student outcomes,[124] while digital courseware can help students succeed in high-enrollment, general education courses.[125] Part-time and adjunct faculty are often tasked with teaching introductory and online classes; however, institutions do not always provide them with access to the same tools, resources, and training afforded to full-time and tenured faculty. Further, due to their temporary employment status, adjuncts face unique challenges in implementing new technologies and redesigning curricula to implement effective pedagogies. By understanding the needs of part-time and adjunct instructors and taking steps to support them, colleges and universities can help these populations improve their teaching to benefit more students.

Overview

Recent decades have witnessed a meteoric rise in institutions' employment of adjunct and part-time faculty. The American Association of University Professors reported that tenured and tenure-track faculty comprise just 29% of the current academic labor force and the other 70% of teaching positions are filled by part-time instructors.[126] Practices to support adjunct faculty, particularly in technology integration, vary widely across the field. To help departments understand their institutional cultures as they pertain to adjunct faculty, the Delphi Project on the Changing Faculty and Student Success, a collaboration between the Association of American Colleges and Universities (AAC&U) and the University of Southern California's Pullias Center for Higher Education, has created a self-assessment tool. Leadership can use the results to address any gaps in creating a supportive environment that enables adjuncts to best meet student needs.[127]

A 2015 report on institutions' affordances for online adjunct faculty by WICHE Cooperative for Educational Technologies (WCET) and The Learning House, Inc. provides some insights from the field. In a survey of more than 200 higher education leaders, researchers found that 35% of institutions offer technical support 24/7, while an additional 35% make this support available during regular business hours plus some nights and weekends — however, the remaining 30% of respondents' institutions did not offer this assistance. More positively, 84% of those surveyed advised that their institutions provided instructional design support to adjuncts. The study's authors recommend that all institutions adopt processes to train online adjunct faculty in technology use that is essential to their course delivery.[128]

Even when institutions take steps to support part-time faculty, a number of financial and logistical issues impede the adjunct workforce's ability to access these resources. Low wages and lack of access to benefits impact many in the field. A study by University of California Berkeley's Center for Labor Research and Education found that 25% of part-time faculty in US higher education receive some form of public assistance, such as food stamps or Medicaid.[129] Adjunct faculty typically do not receive institutional compensation for engaging in professional development to learn new skills or harness the latest teaching technologies. Furthermore, many adjuncts balance their teaching loads with other employment, making it difficult to carve time out of their busy schedules to pursue training opportunities.[130] Institutions often provide adjunct faculty with their teaching assignments just before classes begin, leaving them scant time to learn a new technology or adapt a syllabus to a platform with which they are familiar.[131] This can impact students' experiences and potentially skew the results of improvements in learning outcomes if a department is attempting to scale a technology across its course sections.

Implications for Access and Equity

"These students are not being served well if the instructors they have are not being supported or given the tools necessary to utilize the resources on campus."
- Technology Lab and Multimedia Analyst, Community College

In community colleges, 68% of students arrive underprepared for postsecondary level coursework and must enroll in developmental or remedial education courses,[132] of which three-quarters are taught by adjuncts or part-time faculty. These students often need additional assistance, while instructors who want to help must engage in unpaid labor outside of their contracted course hours, either by working with students directly, participating in professional development to improve their teaching skills, or both. Field leaders have indicated that investing in training for adjunct faculty is key to improving student outcomes at community colleges.[133]

Researchers from AAC&U have also recommended that institutional leaders tap part-time and non-tenure-track faculty to incorporate strategies that help vulnerable learner populations. In their report "Assessing Underserved Students' Engagement in High-Impact Practices," the authors found that "educationally purposeful activities," or active learning experiences, proved beneficial for minority, first-generation, and transfer students, whose gains in retention rates and grade point averages exceeded those of white students.[134] Incorporation of learning technologies can foster active learning. For example, when Colorado Technical University adopted the Intellipath adaptive platform, students reported that classes were "more fun," while assessment data indicated an increase in both student engagement and long-term learning.[135]

A report by EAB notes that it is essential to incorporate faculty in initiatives aimed at improving student retention and completion. The success of technology-enabled targeted interventions and pedagogical innovations rests with faculty; institutional leaders must support instructors by sharing expectations and promoting the spread of best practices.[136] Adjunct faculty provide instruction to more than half of all community college students. Engaging Adjunct Faculty in the Student Success Movement, a new project by nonprofit organization Achieving the Dream (ATD), aims to integrate adjuncts into reform efforts and success initiatives under the leadership of full-time faculty. With support from The Leona M. and Harry B. Helmsley Charitable Trust and the Great Lakes Higher Education Guaranty Corporation, ATD is providing funding to six community colleges that serve large proportions of low-income, minority, and first-generation students.[137] One grantee institution, Patrick Henry Community College, plans to support adjuncts' professional development by pairing them with full-time faculty mentors who teach in the same discipline.[138]

Potential Solutions

An interview with Linda Comte, one of six Directors of Educational Technology Services at Houston Community College (HCC),[139] surfaced best practices for providing adjuncts with technological and pedagogical assistance. HCC enrolls over 55,000 students[140] and employs 2,500 adjunct faculty. Comte describes the need to support adjunct faculty as a matter of survival for her institution; as such, HCC makes all services and online resources available to adjuncts as well as full-time faculty members. Staff at the system's eight Curriculum Innovation Centers work with instructors to integrate the latest technologies into their courses and facilitate engaging learning experiences. Adjuncts can receive training on special projects, such as digital storytelling[141] or designing an online course, as well as basic assistance with learning management systems and grade entry software. The centers are accessible during set hours or by appointment, providing flexibility for adjuncts to visit the location nearest their home, place of employment, or teaching campus. Comte credits inclusivity, perseverance, and open communication with leadership and faculty as factors contributing to her institution's success in meeting adjuncts' needs.

As most adjunct faculty do not have office space on campus, making connections with fellow part-time instructors can be difficult. Institutions are recognizing the value of building adjunct communities to foster idea sharing, exposure to best practices, and other forms of support. Rochester Institute of Technology is leveraging a "lunch and learn" or "dinner and discussion" model to provide its adjuncts with accessible professional development on teaching strategies and current issues as well as networking opportunities.[142] Adjunct faculty at the University of North Carolina at Charlotte teach a large number of introductory courses. To ensure students are receiving high-quality instruction that prepares them for subsequent study, the institution's Center for Teaching and Learning is piloting a yearlong professional learning community for adjunct faculty. A group of 18 adjuncts will engage in a series of in-person and virtual meetings on pedagogy and instructional technology.[143] Additionally, Tallahassee Community College's Academy of Teaching, Learning, and Success (ATLAS) program offers workshops led by full-time faculty for adjuncts to gain exposure to technology integration resources as well as teaching and assessment strategies. Participants receive a stipend for their time investment.[144]

Finally, NMC survey respondents offered practical, actionable suggestions for institutions to help adjunct faculty. Ideas included moving technology training and other continuing education online, allowing part-time faculty to partake as their schedules permit; providing adjuncts with the same access to campus resources (including instructional designers, centers for teaching and learning, and the ability to apply for technology grants) as full-time faculty; and compensating adjuncts for time spent pursuing professional development. Some institutions have set up funds specifically for adjunct instructors to engage in continuing and professional education. In the Maricopa Community Colleges system, adjuncts can apply for reimbursement for attending external conferences, seminars, or workshops designed to improve their teaching.[145] Webster University also provides adjuncts with financial support for professional development or research activities and associated travel. Eligible adjunct faculty include those who have taught 27 or more hours at the institution or have logged three years of teaching in higher education; funded individuals must complete a final report describing the activities' impact on their work.[146]

Key Takeaways: Supporting Adjunct Faculty through Tech Deployment

- Due to their temporary employment status, adjuncts face unique challenges that impact their ability to successfully deploy educational technologies, including balancing other jobs, last-minute hiring, and a lack of training opportunities.
- As adjuncts comprise 70% of the academic workforce, it is imperative that institutions help them adopt learning innovations that have proven to improve student outcomes.
- Exemplar institutions are offering comprehensive resources for adjuncts including networking engagements, access to professional development, and technological and pedagogical support in implementing learning technologies.

Innovation Implementation Learning Curves

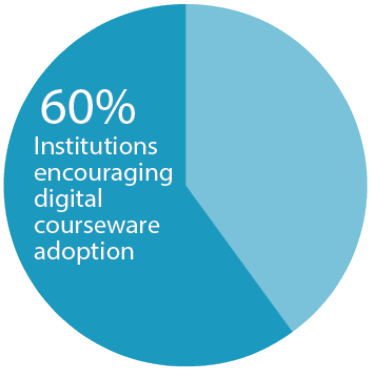
As rapid changes in educational technology transform the state of teaching and learning, faculty members may encounter obstacles as they adapt their pedagogies and experiment with new methods of content delivery. New approaches also have potential to impact students' experiences as they adjust their learning proficiencies. It is important that faculty remain mindful of the spectrum of technological capabilities possessed by their students. As students lead the charge for more affordable materials[147] and the field begins to understand the affordances of innovative technologies,[148] institutions must work with faculty to support transitions to flexible, lower-cost options and incorporate tools and methods designed to improve student outcomes. Robust professional development strategies can increase instructors' self-efficacy and ensure that faculty are prepared for this teaching shift, enabling them to create positive, productive learning environments.

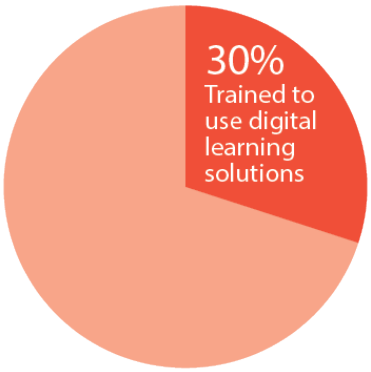
Overview

"It's an uphill battle for all concerned to shift to learning models that are not about memorizing content for a standardized test."

- Assistant Vice President, Academic Affairs, Private Four-Year Institution

A study conducted by *Faculty Focus* indicated that nearly 75% of respondents have incorporated a new technology into their classrooms within the last year, indicating that a majority of faculty are willing to try new approaches.[149] However, one of the main obstacles that prevent faculty from engaging in experimentation is a perceived lack of self-efficacy — a belief in their ability to understand new tools and integrate them successfully with their instruction.[150] A 2015 study by researchers at West Chester University of Pennsylvania on faculty attitudes about online education found that excitement must win out over fear for a faculty member to embrace online teaching.[151] Faculty who have previously taught online are more likely to view online learning as a practice that meets student needs; this population also exhibits fewer concerns about their own technology prowess, issues related to a lack of face-to-face interactivity, and the ability of online course delivery to help students achieve learning outcomes. These findings suggest that experience increases comfort with novel approaches.[152]





source: http://www.onlinelearningsurvey.com/reports/EGA009_CourseWP_Upd_Rd7.pdf (PDF)

Many young instructors on a tenure track are advised to prioritize research and publishing over improving their pedagogies.[153] Only a minority of campuses recognize or reward faculty use of technology in teaching.[154] Beyond impact on students, other important factors that contribute to slowing the learning curve of technology adoption are the perceived lack of either time or technical skills to make the transition, as well as having a negative initial experience with tool deployment due to insufficient support. If faculty encounter challenges during initial adoption or suffer negative feedback as a result of their experimentation, they are less likely to try another technology or alter their teaching methods so as to reduce their professional vulnerability.[155] This resulting stagnation could limit the spread of new technologies and alternative resources.

Tyton Partners' recent nationwide survey of over 2,700 faculty and administrators revealed that while 60% of respondents' institutions encouraged digital courseware adoption, only 30% reported being trained to use digital learning solutions.[156] The field is beginning to acknowledge this disparity: in a 2015 survey by Campus Computing,

the need to support faculty as they incorporate technology into their pedagogies was identified as the top IT priority for the next two to three years by higher education CIOs and senior IT officers.[157] A report by EDUCAUSE Center for Research and Analysis (ECAR) echoed the centrality of IT's role in addressing this challenge by providing faculty training, and recommended that institutions prioritize development and assistance that align sound pedagogy with technology incorporation. Findings also indicated that student assessment of faculty technology use was more positive at institutions that provide support for instructors to adopt technologies of their own choosing.[158]

Implications for Access and Equity

It is essential for faculty to attain a level of technical competency to properly assist students with learning technologies and blended environments. Pilot programs for new learning approaches that leverage technology can fail because students do not know how use the tools. In a survey of over 13,000 higher education faculty, ECAR found that 23% believed that their students lacked sufficient technological skills to fulfill course requirements, while 37% indicated that too many students depend on them for technology support.[159] These results reflect prevalent assumptions that students should possess high digital literacy due to their immersion in technology-rich environments; however, research has shown that this exposure does not necessarily equate to confidence, especially in an educational context.[160]

Further, ECAR's survey of 50,000 students reflected that approximately one-third believe that they entered college unprepared for technology usage.[161] Instructors may underestimate how issues of digital equity, or unequal access to broadband internet,[162] impact low-income students. Additionally, few institutions engage in comprehensive, well-integrated efforts to provide technology training to students. A survey of instructional designers (IDs) conducted by Intentional Futures found that approximately 95% of responding IDs work with faculty at least once a week, yet fewer than half reported working with students on a weekly basis, while one in five never assist students. IDs are a resource that faculty can tap to improve students' experiences with educational technology.[163]

Institutions are challenged to help faculty adopt emerging technologies and resources that improve student learning and increase equity in higher education. Low-income and at-risk students frequently cite the expense of education as one of the biggest factors in their enrollment decisions.[164] In a student survey conducted by online content developer XanEdu, 50% of students indicated that their institutions are not doing enough to control the cost of course materials.[165] Many times, financially-burdened students do not obtain course texts until the semester is well underway because of the timing of institutional financial aid distributions. Use of open educational resources (OER) would level the playing field to ensure that all students start their courses with access to all learning materials.[166] The University of Georgia's integration of OER, including materials from nonprofit open-source publisher OpenStax, has saved approximately 20,000 students nearly $2 million over the last three years.[167] The institution has also begun piloting the use of Concept Coach, adaptive software imbedded in OpenStax texts intended to increase students' content retention.[168]

Potential Solutions

College and university leadership must embrace the prospect of experimentation and trial in the classroom. Risk-taking and failure are often necessary elements of innovation.[169] Learning from the mistakes and challenges of others[170] and being willing to share experiences[171] are fundamental parts of this dialogue. Additionally, faculty can mitigate the possibility of negative student feedback by increasing transparency and two-way communication. Students benefit when instructors explain how a tool or method enhances learning or share expectations about the anticipated outcomes of technology implementation.[172] A multi-institution pilot project by AAC&U, for example, directed faculty to incorporate problem-based challenges aimed at increasing students' academic confidence; prior to assigning the new work, instructors used the Transparent Assignment Template to initiate

discussions with students that outlined expectations and the assignment's purpose. Results of this enhanced transparency included increased skill mastery and student motivation, particularly for underrepresented populations.[173]

There is a need for an institutional culture that views faculty as collaborative learners.[174] Possessing deeper technology skills beyond just-in-time training is valued by students, faculty,[175] and university presidents.[176] Georgetown University identified the revamping of the function of teaching and learning centers as a solution. These centers should move beyond project-based assistance to focus on deeper education for technologists and faculty, while also serving as a research hub to inform the future of educational technology.[177] Other thought leaders call for leveraging the personalized learning and open peer-to-peer networks as the next form of educators' professional development.[178]

To combat higher education's "iron triangle" of cost, quality, and access, the University of Central Florida (UCF) prioritizes professional development for faculty who teach in blended and online learning environments, allowing the institution to maintain instructional quality while extending its instructional reach.[179] Instructors who wish to teach an online course must receive clearance from their department chair to enroll in IDL6543, UCF's flagship faculty development course provided by the university's Center for Distributed Learning. Participants engage in a ten-week curriculum to learn about educational technologies, develop pedagogies specific to online delivery, and design their courses. The program is delivered in a blended environment that requires at least 80 hours to complete.[180] UCF has also collaborated with EDUCAUSE on BlendKit 2016, a free course that provides faculty and instructional designers with resources to aid in the creation of high-quality blended courses.[181]

Key Takeaways: Innovation Implementation Learning Curves

- While the field is recognizing the value of digital learning solutions, faculty lack support in adapting their pedagogies to provide a more seamless experience for students.
- Low-cost technology resources and open educational resources have potential to address pervasive affordability issues in higher education, but institutions must be mindful of students' varying levels of technical ability and provide assistance.
- Professional development opportunities can help instructors improve edtech user experience. Institutions must foster an environment where pedagogical experimentation flourishes, while understanding that setbacks are part of the innovation process.

Sustaining Innovation through Leadership Changes

Sustainability for long-term success is a vital consideration when developing a new program, especially as external factors such as funding and leadership are prone to change. However, the process for preparing for the unknown is not always well-defined, nor is it currently the norm at colleges and universities. Planning for and implementing innovative approaches to improve student success at higher education institutions requires dedication from leadership, faculty, and staff. Unfortunately, leadership vacancies or transitions can result in project delays or hinder the development and growth of programs to effectively meet student needs. Turnover in key institutional positions can also render promising initiatives without a driver, especially if a clear innovation strategy is not implemented to propel sustainable change and other participants do not feel a sense of ownership over the program.[182] Institutions must identify successful strategies for making continued progress on promising innovations in the face of transitioning governance.

Overview

When a major senior leadership position at an institution is vacated, strategic campus initiatives can suffer delays,[183] prompting negative perceptions from faculty, staff, and students. In addition to internal challenges, external forces can further sidetrack the program. For example, governance changes have potential to influence institutions' credit ratings, which can determine the future of successful initiatives. A recent report by Moody's Investors Service indicates that leadership upheaval or volatile relations between institutional presidents and their boards can impair the financial health of colleges and universities, particularly for smaller institutions.[184] A downgrade in credit rating affects institutions' interest rates on borrowed funds, which in turn impacts institutions' ability to make investments in technology, infrastructure, or personnel aimed at increasing student success.[185]

Efforts to improve student outcomes are more sustainable when all staff view themselves as integral to an initiative's success. Supporting students through degree completion must become a whole-campus priority.[186] Fostering collective ownership across an institution is key to sustaining student success initiatives through leadership transitions. Programs must be designed around a collection of roles rather than one personality. To drive innovation on campus, there is a need for stakeholders at every level to participate in devising a cohesive shared vision to create a sense of shared responsibility. At the outset of a new initiative, it is necessary to communicate a clear sense of urgency and purpose that aligns with the institution's core mission.[187] This strategy will help coalesce faculty, staff, and leadership around a feeling of investment in the midst of any infrastructure transformations.

The development of a program charter and organizational strategy can better define the journey and empower participants to self-assign responsibilities that align with their individual strengths and goals.[188] To obtain faculty and staff buy-in as new processes are implemented, they need to recognize not only their specific obligations, but also to connect their involvement to the greater goal of cultivating student success.[189] In this sense, faculty must see how the use of a new technology, for example, fits in with their pedagogies and course design from the very beginning of the process. Inclusive discussions with leadership and ongoing training and support are essential in achieving this understanding. Leadership can also develop processes drawn from the lean start-up model that allow for new ideas to be surfaced and implemented on a micro scale.[190] In this environment, agility and openness are integral, fostering innovation by surfacing leadership qualities within stakeholders of all roles.[191]

Implications for Access and Equity

Increasingly, college students no longer meet the traditional profile of attending school full-time immediately following high school graduation.[192] Institutions are recognizing that these students — often low-income, minority, or parents — need unique support as they seek education alongside

other responsibilities in their lives such as caring for dependents or working part- or full-time.[193] Student success initiatives, advancements in learning technologies, new pedagogical models, and use of a variety of content delivery formats are among the strategies institutions are employing to help more of these students stay in school and reach graduation.[194] If a pilot program halts due to a loss of funding or leadership, participating students experience disruption as the assistance provided by the initiative wanes or disappears altogether. Institutions must take steps to ensure that these advancements are not threatened by personnel departures, and strive to make transitions seamless for students. Rather than addressing the challenges of a leader's exit just before it is announced, creating a sustainable program entails thinking proactively about potential threats to students before they occur.

Through the Integrated Planning & Advising for Student Success (iPASS) initiative funded by EDUCAUSE, colleges and universities serving large proportions of low-income, minority, and first-generation college students are implementing technologies for education planning, counseling and coaching, and risk targeting and intervention.[195] To promote sustainable growth, iPASS institutions are receiving "Change Essentials," evidence-based leadership training grounded in research by Dr. John Kotter of Harvard University.[196] This program teaches faculty, staff, and administrators to facilitate cross-departmental collaboration and mission alignment. By leveraging the training and thinking critically about goals of tool deployment, iPASS campuses aim to transform their infrastructure, creating a sense of institution-wide investment in student success.[197] These strategies decrease the likelihood of programmatic disruption caused by individual exits.

Potential Solutions

To solve this challenge, leaders can engage in radical transparency throughout innovation initiatives, sharing data, developments, and next steps with all stakeholders. Not only do these practices increase accountability and build trust, but they also have potential to surface bottlenecks and identify areas in need of extra attention. For example, at Valparaiso University, new five-year strategic plans are drafted annually and shared with faculty, staff, and students. Any feedback is incorporated into a revised version before the plan is reviewed by the institution's board of trustees.[198] As institutions implement changes that may require significant time before impacts are felt, regular dissemination of updates can help campuses celebrate incremental progress in the right direction. The president of Middle Tennessee State University hosts weekly meetings with the Student Success Group, a network of key leaders and staff, to review progress on strategic initiatives; reports are also generated on a weekly basis to monitor performance metrics.[199]

"Probably the best strategy is to assure executive support at the highest levels of the campus. If the president and cabinet support the innovation, then it's likely to be sustained even when key mid-level leadership changes."
- Vice President, Technology & Communication, Public Four-Year Institution

Institutions must find effective ways to involve students in decision-making. Incorporating student perspective in student success initiatives catalyzes momentum, maintains relevance, addresses the real needs on individual campuses, and keeps administrators motivated by providing tangible evidence of impact and student buy-in.[200] One flourishing model is the University Innovation Fellows, a national student leadership program that aims to elevate the student voice in on-campus innovation processes. Participants collaborate with their peers on cross-institutional partnerships and work with faculty and senior administrators to build resources and initiatives for student success on their campuses.[201] During a site visit to Google's Silicon Valley campus, Fellows were exposed to design thinking methodologies and the company's "yes, and..." approach to building on team members' ideas by facilitating productive dialogue.[202]

NMC survey respondents also shared details of successful measures their campuses are implementing to sustain progress in student success initiatives. Ideas include the creation of manuals and other continuously updated resources that document workflow long-term as well as cross-training to ensure multiple stakeholders understand key processes. Further, instituting regular reviews of these systems can help ensure that future leaders will assume accountability for continuing and updating management practices. Succession plans for transferring the priorities of top leadership must make clear that initiatives are owned by the institution — not the individual.

Key Takeaways: Sustaining Innovation through Leadership Changes

- Changes or vacancies in senior leadership positions can slow deployment of student success initiatives unless processes are implemented to foster a campus-wide investment in and sense of responsibility for an institution's mission.
- Institutions must plan ahead to ensure that personnel or funding changes do not disrupt provision of services in student success initiatives, particularly for non-traditional students who need extra support.
- Increased transparency, involving students in innovation efforts, and change management training can create a long-term path to improvement.

Conclusion

Solving the challenges presented in this report cannot be a solo activity. While there are many innovative postsecondary policymakers, leaders, faculty, and staff, collaboration among these groups is critical. The conversations and strategic planning must be ongoing as student demographics, student needs, and learning technologies evolve. Institutions have a social and economic responsibility to contribute to the collective success of US postsecondary education, cultivating environments that encourage experimentation and promote evidence-driven changes. In this vision, failure is a necessary stepping stone to success. Pilot programs, proofs of concept, and other initiatives will not always yield positive or sustainable results, but supporting long-term student success requires adopting 21st century practices and acknowledging that there may be growing pains.

The design, implementation, and evaluation phases of new technology-enabled learning approaches require cohesive strategy, communication, and transparency about the resulting data and obstacles. Many of the institutions profiled in this report are dedicated to advancing digital tools and evidence-driven models that bridge access and equity gaps for disadvantaged student populations. Initiatives have been developed with a lens toward scaling solutions that help more students — particularly low-income, first-generation, and minority students — not only stay in school, but also attain their goals and be productive, impactful members of society.

While the projects and products described in this report are in various stages of deployment, they are all works in progress worth watching. Documenting and sharing the success stories and impediments will be vital for any institution with student success initiatives underway. In this sense, institutions must work to break down the barriers of traditionally siloed departments and embrace communities of practice and thought leadership from innovators and early adopters.

This publication is not intended to be prescriptive but instead a catalyst for more informed conversations and better articulated questions. The seeds planted at SXSWedu in March 2016 will continue to grow with proper nurturing. As such, the NMC is orchestrating a series of events that take the ideas inherent in this publication and help postsecondary leaders move them into practice. The first workshop is planned for the OLC Accelerate conference in November 2016, in which higher education leaders will devise strategies for implementing the solutions to four of the eight challenges.[203] Participants will assemble into task forces that address the need for standard readiness and evaluation frameworks, more grant opportunities for institutions focused on bolstering student access and equity, and improved marketing and dissemination around digital learning initiatives so the continued narrative is deeply understood by a broad audience.

More face-to-face and virtual convenings will follow as the solutions are designed and implemented with the aim of turning these events into a movement. In this movement, the NMC envisions a nation where millions more students graduate and thrive in their careers. Both tenured and adjunct faculty are adequately supported through technology deployments and leadership changes, and they are all personally invested in spreading innovative teaching practices. Institutions continuously collect holistic data on student performance and leverage it to better cater to needs and develop effective programs. Postsecondary leaders espouse a mindset of transparency, sharing data, best practices, and pain points, and packaging initiatives in a way that make them easier for others to adapt.

It is our hope that readers will join the movement by committing to carrying out this vision together.

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