

**EDUCAUSE**

**Horizon Report Preview | 2019 Higher Education Edition**



# EDUCAUSE 2019 Horizon Report Preview

The EDUCAUSE Horizon Report Preview provides summaries of each of the upcoming edition's trends, challenges, and important developments in educational technology, which were ranked most highly by the expert panel. Learn more at [educause.edu](http://educause.edu).

## I. Key Trends Accelerating Technology Adoption in Higher Education

### Long-Term Trends: Driving Ed Tech Adoption in Higher Education for Five or More Years

- Rethinking How Institutions Work ..... 2
- Modularized and Disaggregated Degrees ..... 2

### Mid-Term Trends: Driving Ed Tech Adoption in Higher Education for the Next Three to Five Years

- Advancing Cultures of Innovation ..... 3
- Growing Focus on Measuring Learning ..... 3

### Short-Term Trends: Driving Ed Tech Adoption in Higher Education for the Next One to Two Years

- Redesigning Learning Spaces ..... 4
- Blended Learning Designs ..... 4

## II. Significant Challenges Impeding Technology Adoption in Higher Education

### Solvable Challenges: Those That We Understand and Know How to Solve

- Improving Digital Fluency ..... 5
- Increasing Demand for Digital Learning Experience and Instructional Design Expertise ..... 5

### Difficult Challenges: Those That We Understand But for Which Solutions Are Elusive

- The Evolving Roles of Faculty with Ed Tech Strategies ..... 6
- Achievement Gap ..... 6

### Wicked Challenges: Those That Are Complex to Even Define, Much Less Address

- Advancing Digital Equity ..... 7
- Rethinking the Practice of Teaching ..... 7

## III. Important Developments in Educational Technology for Higher Education

### Time-to-Adoption Horizon: One Year or Less

- Mobile Learning ..... 8
- Analytics Technologies ..... 8

### Time-to-Adoption Horizon: Two to Three Years

- Mixed Reality ..... 9
- Artificial Intelligence ..... 9

### Time-to-Adoption Horizon: Four to Five Years

- Blockchain ..... 10
- Virtual Assistants ..... 10

Photo credit: DisobeyArt/Shutterstock, Inc.

## Long-Term Trends: Driving Ed Tech Adoption in Higher Education for Five or More Years

### Rethinking How Institutions Work

Institutions of higher education are actively developing new strategies to rethink how they fulfill their mission. Economic and political pressures have heightened scrutiny of the merit of a postsecondary education, especially in light of cost, access, and workforce readiness. Increasingly diverse student populations have added momentum to the attention paid to student success—attention that is frequently focused on low completion rates and high student loan debt. Not only are students more diverse, but a specific aspect of that diversity is the “new majority learner,” who is older, more likely to be balancing work and family with college, and has vastly different needs from those of a traditional-aged student navigating a residential college experience. Institutions of higher education are rethinking how to meet the academic and social needs of all students seeking credentials or degrees. This shift to student-centered learning requires faculty and academic advisors alike to act as guides and facilitators. Approaches to new degree programs, including the rise in new forms of interdisciplinary studies, indicate that institutions are seeking to provide students with experiences that connect disciplines while rethinking how to capitalize on existing resources.

### Modularized and Disaggregated Degrees

Models of education have emerged that provide individual learners with options for education and training that transcend traditional pathways to degrees and other credentials. Opportunities for learners to blend their formal education with modularized online coursework, at an affordable cost, are establishing a learning continuum along which an evolving workforce can easily upskill. Badges and certificates provide prospective employers with evidence of skills gained through a wide range of educational opportunities and venues. While some contend that these competing models of education will destabilize or replace the traditional campus system, others believe modularization and the opportunity for learners to “build their own degree” will increase the odds for students to succeed by combining traditional and nontraditional degree paths. Institutions that develop partnerships with online course providers or otherwise create a variety of options for students to master content at their own pace are responding to the needs of learners who want more control over learning pathways when earning a certificate or a degree.

## Mid-Term Trends: Driving Ed Tech Adoption in Higher Education for the Next Three to Five Years

### Advancing Cultures of Innovation

Though not yet common across institutions, full-scale incubators are nonetheless a trend in higher education as institutions seek innovative solutions that provide students with experiences that better prepare them for the workforce. This trend goes beyond innovations related to institutional operations, creating an opportunity for institutions seeking to establish a culture of innovation for their learners. These entrepreneurial campus partnerships provide students with the chance to learn skills beyond conventional disciplinary knowledge and focus on workforce preparedness, giving graduates an advantage when they enter the job market. Venture labs, incubators, and other forms of business partnerships encourage industry collaboration and enable student experiences to iterate beyond traditional education. Significantly, the opportunity to embrace “failing forward” as a construct of innovation nurtures a culture of experimentation. Faculty have the chance to incorporate dynamic experiences into their coursework, and students who enter the workforce with the exposure gained from the entrepreneurial mind-set are more prepared for rapidly evolving business sectors.

### Growing Focus on Measuring Learning

The methods and tools that institutions use to capture and measure academic readiness, learning progress, and other indicators of student success have matured as courseware products and platforms have gained widespread use. The expanse of data generated by increasingly integrated digital learning environments, together with emerging open standards for learning data, offers institutions new opportunities to assess, measure, and document learning. Although the quantity of data generated provides institutions with broad information to meet the needs of a diverse population of learners, leveraging rich data from across multiple platforms also creates challenges. Understanding how to use learning analytics to inform student progress may be elusive for campus leaders and faculty alike because the need to distinguish between different types of learner data is a relatively new skill. Further, the heightened need to interact with institutional research units and the expanded role of teaching and learning centers call for a rethinking of departmental collaboration. Preparing for a more data-centered approach to teaching, learning, and advising will require a strategy to upskill key institutional roles and develop a clear understanding of what is being measured across multiple platforms.

## Short-Term Trends: Driving Ed Tech Adoption in Higher Education for the Next One to Two Years

### Redesigning Learning Spaces

The transition to active learning classrooms and spaces in higher education has gained considerable momentum in recent years. Designing and evaluating spaces that facilitate active learning and collaboration require investments and strategic planning to renovate or construct classrooms, libraries, and common spaces where learning takes place. Although efforts often focus on the elements of redesigned learning spaces—such as wireless bandwidth, display screens, flexible furniture, varied writing surfaces, and abundant power—obtaining stakeholder buy-in and transforming pedagogical approaches are equally significant considerations. Faculty, students, instructional designers, IT staff, and facilities personnel are some of the key stakeholders in the redesign of academic spaces. Physical learning space design is considered a short-term trend, yet a commensurate focus on virtual learning spaces may be further out on the horizon. Many online platforms have bundled solutions to facilitate team-based learning and synchronous meeting spaces, yet emerging learning spaces programmed in extended reality (XR) have the potential to create more engaging and personal experiences for learners than any current developments in online course design.

### Blended Learning Designs

Blended learning designs have steadily increased as a favored course delivery model alongside fully online options. Previously defined by the proportions of face-to-face versus online coursework, blended learning is typified by the integration of those digital solutions most applicable for achieving the learning outcomes of the course. Media-rich digital learning platforms, personalized or adaptive courseware, and web conferencing tools capable of connecting students for synchronous distance activities are becoming common solutions for blended learning designs. Students report a preference for blended learning, citing flexibility, ease of access, and the integration of sophisticated multimedia. Although blended learning is becoming a common course design, the challenges of scaling this modality persist for some institutions. Supporting faculty to design learning experiences that take full advantage of digital platforms and to expand their pedagogical repertoire to include collaboration and student-centered learning design will support the growth of blended learning.

## Solvable Challenges: Those That We Understand and Know How to Solve

### Improving Digital Fluency

Digital fluency is the ability to leverage digital tools and platforms to communicate critically, design creatively, make informed decisions, and solve wicked problems while anticipating new ones. Merely maintaining the basic literacies by which students and instructors access and evaluate information is no longer sufficient to support the complex needs of a digitally mediated society. Learning solutions are designed and deployed using increasingly sophisticated technology, creating a need for learners to gain new skills to meaningfully engage with those tools. Digital fluency requires a rich understanding of the digital environment, enabling co-creation of content and the ability to adapt to new contexts. Institutions must not only support the uses of digital tools and resources by all members of the organization but also leverage their strategic technologies in ways that support critical thinking and complex problem solving.

### Increasing Demand for Digital Learning Experience and Instructional Design Expertise

The growth of instructional design services and the increased use of dedicated course design teams are characteristic of nearly all institutional types. The shift to active learning and the measurement of course quality through rubrics like Quality Matters have resulted in a major shift in focus away from training faculty in the use of technology and toward a new emphasis on course development with teams of specialized learning designers. Knowledge of learning design includes design-thinking approaches to course content and engaging activities, as well as applying principles of universal design to develop content in multiple modalities to ensure access for all students. Demand is growing for instructional design expertise to assist faculty and other subject-matter experts in the development and implementation of adaptive learning platforms, competency-based learning pathways, the gamification of learning experiences, the integration of virtual or augmented reality, and other digital learning innovations. The demand for digitally rich learning environments and pedagogically sound learning experiences will continue to increase, and those institutions investing in learning designers and instructional designers will be better positioned to create rigorous, high-quality programming that serves the needs of all learners.

## Difficult Challenges: Those That We Understand But for Which Solutions Are Elusive

### The Evolving Roles of Faculty with Ed Tech Strategies

At institutions of any type or size, involving faculty in the selection and implementation of educational technologies can be difficult. Whether an institution is implementing a new courseware platform for the purpose of personalizing learning or building a completely new program by applying a pedagogical approach such as competency-based learning, such efforts face a range of challenges. Identifying learning outcomes and engagement strategies before identifying educational technology solutions creates an advantage by establishing faculty buy-in at the earliest stages of a strategic initiative. The role of full-time faculty and adjuncts alike includes being key stakeholders in the adoption and scaling of digital solutions; as such, faculty need to be included in the evaluation, planning, and implementation of any teaching and learning initiative. Institutions that address the needs of all faculty through flexible strategic planning and multimodal faculty support are better situated to overcome the barriers to adoption that can impede scale.

### Achievement Gap

The growing focus on student success across institutional types indicates the importance of addressing the achievement gap in higher education. The ability to define and measure student success remains elusive; recent initiatives designed to increase course and program completion focus on digital solutions. The cost of college and course materials also contributes to the achievement gap. Open educational resource (OER) initiatives have proliferated in recent years, and OER materials are maturing beyond curated, openly available content to include sophisticated digital platforms authored with open content. Institutions are adopting adaptive courseware, personalized learning pathways, and digital tutoring solutions to provide students with immediate feedback and more access to content designed to help them master course material. Despite these options, degree completion in higher education is stymied by factors that go beyond these efforts, and closing the achievement gap continues to be a difficult challenge.

## Wicked Challenges: Those That Are Complex to Even Define, Much Less Address

### Advancing Digital Equity

Digital equity refers to comparable access to technology, particularly to broadband connectivity sufficient to access unbiased, uncensored content and to enable full participation on the World Wide Web. Broadband access remains globally unequal across variables such as income, education, gender, age, ability status, and native language, as well as national, regional, and cultural dimensions. This complex fabric of factors has implications for access to education for instructors and students alike. UNESCO has created aspirational goals for global internet access, and the organization has released a second draft of its Internet Universality Indicators that includes a framework by which nations and international agencies can gather evidence of an open and accessible internet that advances digital equity and inclusion. Access to information and means of expression, as well as the ability to participate in governance, business, and commerce, are essential to the advancement of digital equity.

### Rethinking the Practice of Teaching

Teaching practices in higher education are evolving, as student-centered approaches to instruction play a growing role in course design. The shifting nature of the instructor—from transmitter of knowledge to facilitator and curator—has accelerated the need for strategically planned faculty support and a reevaluation of the role of teaching and instruction. The redesign of courses and programs to take advantage of digital tools enables instructors to evaluate their teaching practices and use student-centered approaches to facilitate learning. Professional development supporting the use of digital tools has evolved into collaborations with instructional design teams and other professionals in the learning science field, accelerating the application of new teaching practices. Without sufficient access to sustained support and the tools and resources essential in the design of a student-centered environment, instructors are challenged to create these experiences on their own. Managing the changing practice of teaching requires that institutions intentionally design faculty support that is not bound by location or time.



## Time-to-Adoption Horizon: One Year or Less

### Mobile Learning

The modern age of mobile learning sparked by the smartphone and tablet is now over a decade old, and students and teachers today rely on their mobile devices as a vital part of the entire learning experience. Mobile learning is no longer focused directly on apps but instead on connectivity and convenience, with the expectation that learning experiences will include mobile-friendly content, multidevice syncing, and anywhere/anytime access. As mobile devices become more powerful and affordable, and as ownership reaches ubiquity in many countries, the possibilities for engaging learning experiences are becoming limitless. The increased use of augmented reality (AR), virtual reality (VR), and mixed reality (MR) has enabled mobile learning to become more active and collaborative. Creating this quality mobile learning experience takes a lot of effort, however, and as a result remains in the early stages of adoption.

### Analytics Technologies

Analytics technologies are a key element of student success initiatives across institutions and a driving force behind the collaborative, targeted strategic planning and decision-making of higher education leaders. Analytics technologies and capabilities will be an essential component of institutional thriving in the years ahead. Beyond static, descriptive analyses of student learning, grades, and behaviors, analytics capabilities comprise dynamic, connected, predictive, and personalized systems and data. Institutions and institutional leaders will need to develop these advanced analytics capabilities through innovative leadership, new computational technologies and systems, and a highly skilled workforce equipped for understanding and effectively sharing and using large and complex data resources. Analytics done well is a time- and resource-intensive endeavor for any institution, but if executed and maintained successfully, it can transform institutions and deeply enrich student and faculty educational experiences and success.

## Time-to-Adoption Horizon: Two to Three Years

### Mixed Reality

At the intersection of the online and offline worlds is an emerging environment known as mixed reality (MR), where digital and physical objects coexist. This hybrid space integrates digital technologies into the physical world and creates virtual simulations of physical spaces, blurring the differentiation between worlds. Virtual reality immerses the user in a simulation, such as the experience of flying or being on Mars. Augmented reality layers information over physical spaces and objects, such as labels and other supplementary data over museum displays. Holographic devices are also being used to create mixed environments, as video displays project 3D images into a physical space: A hologram of Amy Winehouse, who died in 2011, will “go on tour” with a band in 2019, and she is not the first dead celebrity to do so. A key characteristic of MR is its interactivity, which confers significant potential for learning and assessment; learners can construct new understanding based on experiences with virtual objects that bring underlying data to life.

### Artificial Intelligence

Artificial intelligence (AI) uses computer systems to accomplish tasks and activities that have historically relied on human cognition. Advances in computer science are creating intelligent machines that functionally approximate human reasoning more than ever before. Harnessing big data, AI uses foundations of algorithmic machine learning to make predictions that allow for human-like task completion and decision-making. As the programming, data, and networks driving AI mature, so does the potential that industries such as education see in its application. However, as AI develops more human-like capability, ethical questions surrounding data use, inclusivity, algorithmic bias, and surveillance become increasingly important to consider. Despite ethical concerns, the higher education sector of AI applications related to teaching and learning is projected to grow significantly.

## Time-to-Adoption Horizon: Four to Five Years

### Blockchain

Blockchain technology functions as a decentralized digital ledger and is currently used primarily to support the cryptocurrencies. The technology employs a distributed data structure in which the records in the ledger are replicated in multiple locations. Blockchain removes the role of a central authority over the ledger, creating a highly secure model whose integrity is built on the trust of all participants. The potential for the blockchain to disrupt and replace centralized systems has captured attention across sectors, including education, though broad adoption of blockchain in higher education remains at least several years out. Meanwhile, colleges and universities are investigating ways in which the technology could be used for areas including transcripts, smart contracts, and identity management. Advocates argue that blockchain has the potential to fundamentally change a wide range of industries that rely on intermediaries—such as banks—enabling a broad ecosystem solution instead, one that features decentralized verification and storage. In higher education, the legacy of blockchain might be what the technology inspired rather than the broad adoption of blockchain technology itself.

### Virtual Assistants

In the 1987 [Knowledge Navigator](#) and 1988 [Future Shock](#) videos, Apple envisioned a future where users of various ages and abilities naturally interfaced with a device screen by speaking commands, asking questions or using gestures to learn, work, and stay connected to others in the virtual environment. Advancements in voice recognition and natural user interfaces have made these interactions a reality. Since the topic of virtual assistants last made an appearance in the 2014 Horizon Report, AI-augmented machine learning has dramatically increased the accuracy of both automatic speech recognition (ASR) and related [natural language processing](#) (NLP), the underpinnings of virtual assistants like Siri, Alexa, Bixby, or Google Assistant. Virtual assistants are commonly available on most smartphones, tablets, and computers, and a new range of independent passive listening smart speakers like the Amazon Alexa and Google Assistant speakers have rapidly become popular home affordances. These devices understand voice commands to perform simple tasks around the home and, with location services activated and added “skills” enabled, can go beyond a simple search tool to provide more complex and competent virtual assistance. While the convenience of these devices has wide appeal, the “always listening” aspect of the interface has some concerned about privacy and security.