2023 EDUCAUSE Horizon Report®
Teaching and Learning Edition



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Kathe Pelletier, Jenay Robert, Nicole Muscanell, Mark McCormack, Jamie Reeves, Nichole Arbino, and Susan Grajek, with Tracey Birdwell, Danny Liu, Jean Mandernach, Ayla Moore, Anna Porcaro, Rayan Rutledge, and Johann Zimmern, *2023 EDUCAUSE Horizon Report, Teaching and Learning Edition* (Boulder, CO: EDUCAUSE, 2023).

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EXECUTIVE SUMMARY

Artificial intelligence (AI) has taken the world by storm, with new AI-powered tools such as ChatGPT opening up new opportunities in higher education for content creation, communication, and learning, while also raising new concerns about the misuses and overreach of technology. Our shared humanity has also become a key focal point within higher education, as faculty and leaders continue to wrestle with understanding and meeting the diverse needs of students and to find ways of cultivating institutional communities that support student well-being and belonging. For this year's teaching and learning *Horizon Report*, then, our panelists' discussions oscillated between these seemingly polar ideas: the supplanting of human activity with powerful new technological capabilities, and the need for more humanity at the center of everything we do. This report summarizes the results of those discussions and serves as one vantage point on where our future may be headed. This project was grounded in a modified Delphi methodology that seeks to elevate the collective perspectives and knowledge of a diverse group of experts, and the panelists' activities were facilitated using tools adapted from the Institute for the Future.

Trends

As a first activity, we asked the Horizon panelists to provide input on the macro trends they believe are going to shape the future of postsecondary teaching and learning and to provide observable evidence for those trends. To ensure an expansive view of the larger trends serving as context for institutions of higher education, panelists provided input across five trend categories: social, technological, economic, environmental, and political. After several rounds of voting, the panelists selected the following trends as the most important:

Social

- Student demand for flexible and convenient learning modalities is increasing.
- The focus on equitable and inclusive teaching and learning has expanded and intensified.
- Microcredentials programs are gaining momentum and maturity.

Technological

- The potential for AI to become mainstream is growing.
- The online versus face-to-face dichotomy is being disrupted.
- Low- and no-code technologies that simplify complex processes are enabling more people to create digital content.

Economic

- Affordability and ROI are impacting potential students' decisions to enroll in postsecondary education.
- As funding for public higher education declines, institutions are expected to do more with less.
- The need and demand for lifelong, workplace learning are increasing.

Environmental

- Climate change is increasingly impacting our daily lives.
- Environmental issues are being integrated into academic programs and institutional operations.
- Technology is behind the curve on reducing its environmental impact.

Political

- Governments are leveraging disinformation and propaganda.
- Nationalism is rising across the world.
- Political party conflict is increasingly blocking decision-making and action in the U.S. political system.

Key Technologies and Practices

Horizon panelists were asked to describe the key technologies and practices they believe will have a significant impact on the future of postsecondary teaching and learning, with a focus on those that are new or for which there appear to be substantial new developments. After several rounds of voting, the following six items rose to the top of a long list of potential technologies and practices:

- AI-Enabled Applications for Predictive, Personal Learning
- Generative AI
- Blurring the Boundaries between Learning Modalities
- HyFlex (i.e., students enrolled in a course can participate on site, synchronously online, or asynchronously online as preferred)
- Microcredentials
- Supporting Students' Sense of Belonging and Connectedness

Having identified the most important technologies and practices, panelists were then asked to reflect on the impacts those technologies and practices would likely have at an institution. We asked panelists to consider those impacts along several dimensions important to higher education: equity and inclusion, learning outcomes, risks, learner and instructor receptiveness, cost, new training required on the part of learners and instructors, and potential impact on institutional strategic goals.

Scenarios

Scanning the trends section and the technologies and practices section, we can begin to gather and arrange the information we have into logical patterns that can help us envision a number of scenarios for the future, for which we could start to prepare today. In this report, we paint portraits of four possible future scenarios for postsecondary teaching and learning:

- **Growth:** The COVID-19 pandemic catapulted remote modalities into the forefront of teaching and learning practice more than 10 years ago. While educators have leveraged this momentum in digital transformation to effect long-lasting institutional changes, profit-driven activities have exacerbated the digital divide among students. Additional equity issues arise as employers become more frequent and significant partners in higher education, developing more granular microcredentials without investing in critical infrastructure to expand access.
- **Constraint:** By 2033, climate change has forced thousands of families to relocate due to unsafe and unaffordable living conditions. As a result, educators and employers are collaborating to offer students flexible options in hybrid and HyFlex learning modalities that include personalized, cross-institutional learning pathways to meet students' needs. Politicians are increasingly spreading misinformation about our climate for the purposes of gaining voters, leaving higher education institutions as one of the few remaining reliable sources on climate change information.
- **Collapse:** By the late 2020s, AI tools had become inexpensive and effective alternatives to humans for many higher education jobs. Faculty and staff numbers were dwindling, making it even harder for the remaining workforce to find the time to connect with their students. Large numbers of students abandoned higher education due to this lack of attention to personal well-being, and the 2025 Enrollment Cliff only worsened the problem. As an alternative to education, students are fully embracing "meta-living," cultivating relationships with human avatars, creating customized home landscapes, and developing new revenue streams—all in the AI-powered metaverse.
- **Transformation:** Faculty and staff have been able to implement novel AI tools for content creation, editing, and dissemination. Low- and no-code technologies enable anyone in higher education, no matter their level of expertise, to create digital content. These tools have freed up capacity for faculty and staff, who can now spend a significant portion of their time engaging and connecting one-on-one with students and fostering community and belonging across the institution. These tools also serve to unite individuals across both local and international communities and with wildly different political beliefs.

Implications Essays

In light of the trends and future scenarios presented throughout this report, what can we say about the implications for institutions and what they can begin to do today to start preparing for these possible futures? This year we took a slightly different approach to these implications essays than in past years. We invited seven panelists to write essays reflecting on the implications of the trends and key technologies and practices from a particular frame of reference, including adult learning; innovation in research and teaching; instructional design at under-resourced institutions; learning spaces; faculty; digital connectivity; and equity and accessibility. Each panelist was asked to reflect on the following questions from their particular frame of reference: What should we do now? What plans should we make?

TRENDS: SCANNING THE HORIZON

Institutions of higher education, and the teaching and learning practices they adopt, are in many ways products of the larger environments of which they are a part. Colleges and universities are always made up of people living at a particular point in history, residing together in particular communities, and sharing a particular mixture of cultural ideas, norms, and resources. Mapping the future of these institutions and their practices demands that we pay attention to the larger social, economic, and other shifts taking place across our global society that may be impacting higher education in profound ways.

To help us explore these larger forces taking shape around higher education, we asked panelists to survey the landscape and identify the most influential trends shaping higher education teaching and learning across five categories: social, technological, economic, environmental, and political. This section summarizes the trends the panelists voted as most important in each of these categories, as well as anticipated impacts of and evidence for each trend.

In this year's report, we see a continued focus on learning modalities with increasing demand for flexibility from students, and educational delivery formats are no longer strictly "online" or "face-to-face." Unsurprisingly, the potential for AI to become mainstream was highlighted, as was a new trend describing how low- and no-code technologies are becoming more widely available, enabling anyone to create digital content. The topics of microcredentials and the demand for learning relevant to the workplace have appeared in the *Horizon Report* for a number of years but may be reaching a tipping point in terms of maturity and momentum. Similarly, equity and inclusivity is a consideration noted in the *Horizon Report* over the years, but this focus appears to be expanding and intensifying in teaching and learning. Meanwhile, institutions are balancing the expectation to do more with less with the pressure to deliver affordable programming that meets the public's expectation of return on investment.

Running across these trends are ongoing issues related to political extremism and polarization, the ongoing rise of nationalism, and environmental issues, all of which increasingly impact our daily lives. Panelists noted specific ways that higher education might contribute to reducing environmental impact, such as integrating environmental issues into academic programs and operations. Technology has a significant environmental impact, including digital emissions, and institutions need to be more mindful and accountable about their digital footprint.

The summary of these trends is drawn directly from the discussions and inputs provided by our expert panelists, in keeping with the tradition of the Delphi methodology. Each of the trends was identified and voted on by panelists without influence from the EDUCAUSE *Horizon Report* staff, aside from our work in organizing and synthesizing the panelists' inputs for presentation here.

Social

Student demand for flexible and convenient learning modalities is increasing.

The focus on equitable and inclusive teaching and learning has expanded and intensified.

Microcredentials programs are gaining momentum and maturity.

Technological

The potential for AI to become mainstream is growing.

The online versus face-to-face dichotomy is being disrupted.

Low- and no-code technologies that simplify complex processes are enabling more people to create digital content.

Economic

Affordability and ROI are impacting potential students' decisions to enroll in postsecondary education.

As funding for public higher education declines, institutions are expected to do more with less.

The need and demand for lifelong, workplace learning are increasing.

Environmental

Climate change is increasingly impacting our daily lives.

Environmental issues are being integrated into academic programs and institutional operations.

Technology is behind the curve on reducing its environmental impact.

Each of the trends encompasses far more complexity and variability across types of institutions and regions of the world than can be adequately captured in such a brief summary. Indeed, the expert panelists—who represent a variety of roles and institutional types within and beyond the United States—routinely reflected on the ways in which trends affect institutions differently across different settings. Where possible, we've tried to account for that variability, though the reader will certainly bring additional experiences and contexts that would further broaden these considerations.

Political

Governments are leveraging disinformation and propaganda.

Nationalism is rising across the world.

Political party conflict is increasingly blocking decision-making and action in the U.S. political system.

SOCIAL TRENDS

Higher education takes place within particular social contexts, and learning experiences are shaped and colored by the people interacting and building relationships through those experiences. Teaching and learning in higher education is a fundamentally social practice, one that is better understood by mapping the important social trends developing within and around it.

Student demand for flexible and convenient learning modalities is increasing.

Impact: Three years from the onset of the COVID-19 pandemic, online and hybrid learning have become commonplace. Well out of emergency mode, colleges and universities are in the midst of deciding the extent to which they will return to face-to-face operations. Now, students want more flexibility and convenience when it comes to how their education is delivered—for individual courses and degree programs on the whole. Demand is growing for flexibility in course start times, length, and format. Students place less importance on in-person classes and more on online options, especially hybrid and HyFlex courses. As institutions plan for sustainability, they will need to be intentional—a "one size fits all" approach will not work. Colleges and universities will need to figure out how to design learning experiences that vary in format and the way they are accessed but are equivalent in quality and learning outcomes. Institutions must also support the faculty creating and teaching these courses—faculty will need training and instructional support to be able to teach across modalities. Institutions will also need to invest in learning spaces that will be sustainable. On-campus learning spaces will need to have up-to-date technology and should be flexible and multifunctional to support hybrid and HyFlex learning, in addition to other teaching and learning and student activities. With ongoing budget cuts, many institutions will need to be creative and find new ways of using existing spaces on campus—for example by making spaces reconfigurable so that they can be used for classes, workshops, and events—or revamping spaces to include more shared workspaces and fewer individual office spaces, which are often underutilized.

Evidence: The most recent EDUCAUSE student survey found that since 2020, students' modality preferences have shifted toward flexible, online options and having access to a variety of online resources and activities. In California, the nine-campus Los Angeles Community College District has an even split between online and in-person courses—compared to pre-COVID, when 80% of courses were in-person—and some in-person classes have been canceled or converted to online classes due to low registration.

The focus on equitable and inclusive teaching and learning has expanded and intensified.

Impact: Scrutiny of social issues has increased worldwide and across contexts, and higher education is no exception. Diversity, equity, and inclusion (DEI) has emerged as a core value at many institutions and is being threaded into key elements of many institutional missions. Institutions are developing initiatives and programs that focus on DEI, and efforts are underway to attract increasingly diverse groups of faculty and students, especially those from marginalized and indigenous groups. Institutions are also in the midst of an accessibility revolution, with a focus on making digital learning accessible to all. Many offer a variety of assistive technologies, and some implement the principles of universal design for learning (UDL), which is "a framework to improve and optimize teaching and learning for all people based on scientific insights into how humans learn." Moving forward, institutions must go well beyond including DEI as a core value and positive messaging. They must work on strategically implementing steps that lead to measurable improvements. Additionally, institutions need to focus on narrowing the widening digital divide and find ways to ensure that students with disabilities and those in the lower quartiles of socioeconomic status have access to high-quality, equitable, accessible learning opportunities, in addition to the tools needed to support them. Ensuring digital accessibility is an ongoing process, and institutions must make significant investments in training and software/tools to ensure learning is accessible to all.

Evidence: Over the past decade, higher education has seen an increase in accessibility lawsuits, with the largest spike in barriers occurring with COVID-19. According to a recent article, "64% of students believe their college or university is supportive of diversity, equity, and inclusion (DEI) on their campuses, but many believe more must be done to see tangible results." A universal design framework by Sheryl Burgstahler can help institutions develop courses that are equitable for all groups.

Microcredentials programs are gaining momentum and maturity.

Impact: Amid a growing viewpoint that the value of traditional degrees is declining, students are increasingly interested in flexible pathways. Thus, institutions are considering implementing microcredentials and stackable credentials as a means of ensuring that their graduates have the flexibility to complete their coursework and obtain the skills needed to enter the workforce. Microcredentials are short courses or programs that allow students to gain specific knowledge and skills needed in the workforce. Stackable credentials can be combined toward a degree or a career pathway, providing multiple entry and exit points—students can earn and benefit from a credential before completing a full degree, and if they need to leave or take time off, they can return and pick up where they left off, continuing to stack their smaller credentials toward a larger credential or degree. As student demographics change to include a larger proportion of adult learners, microcredentials and stackable credentials will be attractive options for working adults who need to upskill or reskill and need flexible options in doing so. Currently, little guidance is available on how to create, implement, govern, and manage microcredentials, thus they tend to vary significantly in their requirements, implementation, and quality. Institutions looking to implement sustainable and valuable microcredentials will need to utilize standards and frameworks that are based on promising practices of institutions with mature microcredentialing programs and that clearly define what microcredentials are and the basic principles and requirements. Issues that will need to be considered and addressed with the implementation and management include affordability, accessibility, and scalability.

Evidence: According to the Strada-Gallup Education Survey, a quarter of Americans would pursue education or training if they lost their job, but most prefer nondegree training over the traditional college route. The Australian Government Department of Education, Skills, and Employment offers a "National Microcredentials Framework," which defines microcredentials, unifying principles, and critical information requirements and outlines a minimum standard for microcredentials that will be available in the marketplace.

FURTHER READING

Chronicle of Higher Education
"Course Correction: Students Expect 'Total Flexibility' in the Pandemic-Era Classroom. But Is That Really What They Need?"

Explore Access
"Designing an Accessible Online Course"

American College of Education
"Micro-Credentials"

TECHNOLOGICAL TRENDS

Technology is constantly changing and growing more sophisticated. As technologies become outdated and new technologies are introduced, institutions of higher education must consistently monitor the usefulness of tech already implemented and plan for new technologies that enable more adaptive decision-making and more flexible teaching and learning experiences. What those technologies are, how they are deployed across the institution, and the ways in which they themselves continue to evolve is one of the ongoing and defining stories of higher education.

The potential for AI to become mainstream is growing.

Impact: Simple AI tools are already ubiquitous in education, mainly used to improve relatively mundane, repetitive tasks. However, as they become more sophisticated, AI technologies are increasingly a viable way for institutions to save money and improve efficiency and workflows. The potential is growing for AI to address more complex and higher-stakes tasks. AI can help institutions address persistent challenges such as enrollment, retention, and financial aid allocation. AI also has the potential to alter the teaching and learning experience. It can impact teaching by helping faculty create instructional content and grade assessments. It can impact the student experience by increasing engagement through the use of avatars and the metaverse, in addition to improving learning outcomes via personalizing learning. On the other hand, advancements in AI have sparked debates about academic integrity, accuracy, and fairness and equity. AI-powered writing technologies are becoming much more sophisticated and widely available, leading many to speculate that cheating will become widespread. Concerns are also growing about whether AI produces accurate, unbiased output. For example, some have questioned the use of AI tools during the student application reviewing process and grading, wondering whether AI provides fair outputs. Others argue that reliance on these tools will cause students to lose important skills. It is too early to determine whether these concerns are wholly founded. Moving forward, institutions will need to plan for how to leverage AI in a way that improves efficiency and simultaneously promotes learning, creativity, innovation, and growth, all the while ensuring that fairness and equity are maintained.

Evidence: AI can write college essays that are indistinguishable from human writing. Concern is growing over potential misuse, and institutions have begun providing information about AI and teaching and learning on their websites. However, some experts are not worried about cheating and believe that AI tools could actually be used to enhance student learning.

The online versus face-to-face dichotomy is being disrupted.

Impact: In the current higher education climate, we see a blurring in the distinction in course delivery formats. During the emergency response phase of COVID-19, institutions had to quickly implement online courses. As institutions continued to adapt, they realized that both faculty and students wanted more flexibility and options and that going back to 100% onsite learning would not be sustainable for many. College officials saw this as an opportunity to integrate digital tools and online experiences into courses that were traditionally face-to-face. This increased adoption of hybrid courses has disrupted the online versus face-to-face dichotomy. Faculty and students now have access to teaching and learning experiences that are multimodal—both online and face-to-face, all in the same course. This blurring of lines presents an even greater imperative to equip faculty with information, knowledge, training, and skills related to best teaching and learning practices so that they can teach across modalities while ensuring that all students have an accessible and high-quality learning experience. Moving away from the online versus face-to-face dichotomy also creates issues with accreditation and funding decisions, as well as communications surrounding course modality—an array of terminology is being used inconsistently to describe modalities. Faculty and student demand for flexible course options is only growing, so institutions will need to rethink the structure, organization, and communication of their course delivery formats.

Evidence: When it comes to navigating the world of online and hybrid instruction, a problem of definitions arises. Individuals within and across institutions are not using consistent language for course delivery formats. Nicole Johnson and colleagues provide a Modes of Learning Spectrum framework for categorizing instructional modalities. This provides a foundation for establishing shared language and conception of course delivery formats.

Low- and no-code technologies that simplify complex processes are enabling more people to create digital content.

Impact: Low-code and no-code (LCNC) technologies that simplify application development are enabling more people to create content. Recent advancements in generative AI create a potential for a drastic change in creative endeavors for faculty, staff, and students. With these technologies, people can create audio, images, text, simulations, and video with little to no coding/programming knowledge. With this come opportunities for the democratization of app development, giving more people opportunities to participate in the digital economy. Currently, many parts of the world face a digital skills gap—businesses are struggling to recruit employees with necessary digital technical skills, including the areas of data analytics, cybersecurity, and software engineering. It's no surprise that recent years have seen rapid growth in the use of LCNC platforms. As the use of LCNC technologies continues to grow, institutions may need to rethink their educational programs when it comes to digital competencies, coding, and programming skills. There may be increased need and opportunities in the workforce for individuals who work with LCNC tech.

Evidence: The University of South Florida used low-code technology to address the need for rapid transformation during the COVID-19 pandemic. Microsoft and the Project Management Institute (PMI) are partnering to announce the Power Platform University Hub, which will teach students how to solve business problems with low-code technologies.

FURTHER READING

EDUCAUSE Review
"Special Report | Artificial Intelligence: Where Are We Now?"

Chronicle of Higher Education
"As Colleges Focus on Quality in Online Learning, Advocates Ask: What About In-Person Courses?"

CIO Dive
"IT Builds Guardrails Around Low Code as Other Units Embrace the Tech"

ECONOMIC TRENDS

Higher education is no stranger to economic challenges. Finding reliable markets and sources of revenue while keeping costs from ballooning is always of critical importance to institutions. Yet economies fluctuate, so institutional leaders need to be prepared for fiscal instability and uncertainty by anticipating declines in funding and adopting new ways of thinking about and planning institutional business.

Affordability and ROI are impacting potential students' decisions to enroll in postsecondary education.

Impact: Student enrollments have been decreasing for a decade, with a sharp decline during the COVID-19 pandemic. Some thought that the pandemic would just be a "gap year" and that enrollments would go back up in 2021, but that was not the case. Fewer and fewer students are enrolling at colleges and universities, and two primary reasons for this are affordability and return on investment (ROI). Across all institution types, tuition has significantly outpaced inflation over the past 40 years. Unsurprisingly, current and would-be students are increasingly concerned about the cost of postsecondary education. Further, students and parents are not fully convinced that a college degree holds enough value, with many feeling that the price of a college degree, in addition to a lack of job certainty upon graduation, does not provide enough ROI. Students are increasingly eyeing nondegree options and early workforce entry. Institutions will need to be more accountable when it comes to providing affordable options and enhancing career outcomes for students. They will need to consider implementing nondegree options and skills-based training, while also being more transparent about student costs, job opportunities, and salaries.

Evidence: Eight states now legally require institutions to collect and distribute data related to factors such as student costs and outcomes (e.g., job availability, salaries earned by degree). The U.S. Department of Education maintains a College Affordability and Transparency Center (CATC) that serves as a central point to several tools that allow users to compare tuition and fees, net price, and other characteristics.

As funding for public higher education declines, institutions are expected to do more with less.

Impact: As funding for public higher education fluctuates (with an overall steady decline over the past decade), institutions have less to spend but are expected to do more to remain sustainable than in the past, such as adopting and implementing more expensive resources to support an increasingly online infrastructure. To cut costs, many are increasingly relying on adjunct faculty, some are cutting lower-level staff to hire more expensive and specialized administrators, and others are eliminating academic programs or student services. Cuts in public funding are also paving the way for continued tuition hikes and increased costs for students, many of whom borrow to cover the costs of their education. Funding uncertainties are only growing. Some predict that public funding will increase due to state surpluses. But concerns over a potential recession and the perceived decrease in the value of a college degree could make it more difficult for higher education institutions to secure funding. With an uncertain financial future, more focus will be put on recruitment and retention, and institutions may need to revisit their financial models and look for alternative funding sources and strategies.

Evidence: State lawmakers have put together their budgets for 2023—and funding for education is mixed. According to a recent article, Illinois Gov. Pritzer proposed a $208 million increase, while Florida Gov. DeSantis proposed a $100 million decrease. Lone Star College received increased state funding during COVID-19 due to steady enrollments, which was attributed to its mission to increase recruitment and retention, in addition to increasing funding for their marketing department.

The need and demand for lifelong, workplace learning are increasing.

Impact: People are living longer, and their work lives are extending—more and more people are staying in the workforce into their 60s and 70s. With technology rapidly advancing, in addition to new discoveries and knowledge rapidly accumulating across industries and disciplines, there is increased need and demand for lifelong, workplace learning. Workers need opportunities to acquire new knowledge and skills to be effective and to avoid becoming obsolete. With workers leaving their jobs more frequently, a recent shortage of skilled workers, and high competition for attracting the limited talent, companies are quickly expanding their education and skills training benefits for employees. One challenge has been the practice of workers leaving their job either permanently or temporarily to gain new skills and knowledge. For lifelong learning to be sustainable, more flexible and digitally accessible training is needed. If higher education institutions want to be competitive in this area, they must implement easily accessible and up-to-date nondegree, stackable training that allows employees to learn as they work and even, at times, on the job. Further, in the future companies will need to hire employees who have both interpersonal skills and advanced technical skills and experience working with new technologies. As a result, institutions will need to incorporate meaningful training experiences in areas such as emotional intelligence, analytics, and AI into their degree and nondegree offerings.

Evidence: PEW research found that 87 percent of employees acknowledge that they will need new skills throughout their careers in order to keep up with changes in the workplace, and "most working adults expect to receive training from employers, but few actually do." The University System of Georgia is focusing on lifelong learning as part of its College 2025 initiative, which addresses cost, affordability, academic quality, and preparation for entry into the workforce.

FURTHER READING

Fortune
"Gen Zers Don't See the Point in Getting a Degree. Here's How to Fix the ROI of College"

Chronicle of Higher Education
"Colleges Fear Cost of Doing Business Will Become Much Costlier"

Forbes
"Lifelong Learning: How Universities Can Act on the Need for Authenticity and Relevance"

ENVIRONMENTAL TRENDS

Institutions of higher education draw on finite local and global materials and resources to fuel their operations, and their facilities leave sizable imprints on the environments around them. The need to adopt sustainable practices across the board, far too often overlooked in higher education planning and decision-making, will be inescapable in a future more concerned with climate stability and environmental sustainability.

Climate change is increasingly impacting our daily lives.

Impact: In 2022, we saw many significant climate events around the world. A number of countries experienced record heat waves and rainfall. We saw deadly natural disasters including floods in India and Nigeria, drought in Uganda, and earthquakes in Afghanistan. Climate change is increasingly impacting our daily lives, including our mental health and sleep, physical health, housing costs, the availability and costs of food, and the loss of natural spaces. Higher education institutions have already responded to climate changes by revamping campus infrastructures, upgrading recycling programs, reducing emissions, investing in more sustainable products, and creating leadership roles responsible for sustainability initiatives. Increasing temperatures and unpredictable and unstoppable future climate events pose risks to campus infrastructures, as well as to personal living infrastructures, which are increasingly used as teaching, learning, and work spaces. The effects could be widespread; in addition to impacting the safety and well-being of students, faculty, and staff, climate effects have the potential to impact all areas of education, including enrollments and retention, teaching, research, student services, and operations. Institutions will need to continuously assess their climate change preparedness and adjust their strategic plans to be able to readily adapt to the effects of climate change, and this will be a necessity for the long run.

Evidence: McKinsey & Company developed The Green IT Revolution: A Blueprint for CIOs to Combat Climate Change, which focuses on where technology can have the biggest impact on reducing emissions and includes both offensive and defensive actions that IT can take. Some institutions, such as Harvard University, have already implemented working groups focused on climate change preparedness and resiliency.

Environmental issues are being integrated into academic programs and institutional operations.

Impact: As the effects of climate change become increasingly visible, and as pressures grow to demonstrate a commitment to sustainability, institutions are integrating these issues into their values, academic programs, and institutional operations. Institutions are investing in leadership roles, working groups and programs, and sustainable technology and are seeking various ways to reduce emissions. Some are taking a stance and are divesting from fossil fuel companies. Many institutions offer degree programs in environmental and sustainability issues and have begun implementing courses across nonscience disciplines. However, environmental education has not become mandatory in many institutions and is still neglected as a component of curriculum. Faculty are increasingly facing the challenge of teaching environmental issues without having formal training or support on the topic. The need for climate literacy generally, not just within the sciences, is becoming apparent. Environmental issues affect all areas of life, and the workforce will increasingly need people with some level of knowledge and experience in areas such as sustainability, environmental technology, green economy, and the environment and health. As institutions integrate environmental education into their academic programs and operations, they will need to move beyond the traditional climate change science lens and focus more on actions and adaptation, such as the steps needed for reducing emissions, being more environmentally friendly, and how to be prepared to adapt in the face of change.

Evidence: The University of Washington voted to divest from fossil fuels by 2027, and Princeton University decided to cut ties with 90 fossil fuel companies. In spring 2022, Mark Stemen of California State University, Chico, facilitated the inaugural Faculty Learning Community in Teaching Climate Change and Resilience, which helps faculty integrate climate change topics into their courses to support the university's Strategic Priority for Resilient and Sustainable Systems.

Technology is behind the curve on reducing its environmental impact.

Impact: In higher education, energy use on campus has been at the forefront when it comes to sustainability practices. With the move to online work and learning, on-campus and transport emissions have certainly been reduced, but digital emissions are increasing. Many of the raw ingredients that go into digital tech come from nonrenewable resources such as metal ores. Mass manufacturing creates harmful waste products and exacerbates the growing issue of electronic waste and disposal. Further, the digital footprint goes well beyond the campus. Institutional digital infrastructures are geographically widespread (e.g., servers, data centers, and now the personal homes of those working and learning remotely). Yet, for many institutions, digital emissions are not often thought of as part of an institution's carbon footprint. We are also now in an era of overconsumption and always being connected. New software, applications, and devices are being adopted without careful consideration of their emissions. Some of this is redundant—multiple technologies being adopted to perform the same functions. Institutions and their constituents will need to be more mindful and accountable about their digital footprint beyond just the campus. They will need to be strategic in their selection of technology, adopting green tech when possible.

Evidence: A study by researchers at Yale University found that internet usage increased by up to 40% worldwide early in COVID-19, which caused demand for up to 42.6 million megawatt-hours of additional electricity. The Sustainability Tracking, Assessment & Rating System (STARS) is a self-reporting framework for colleges and universities to measure their sustainability performance. Currently, 1,132 institutions have registered to use the STARS Reporting Tool.

FURTHER READING

World Bank
"Education and Climate Change: The Critical Role of Adaptation Investments"

Chronicle of Higher Education
"The Climate-Conscious College"

Times Higher Education
"How a Green Approach to Tech Can Attract and Engage Students"

POLITICAL TRENDS

Higher education, for better and for worse, is always entangled in and concerned with the political climate and events of the present moment. In addition to determining overall higher education funding, politics is interwoven with higher education as an object of research and study and as subject matter for courses. Because of this long-standing entanglement, political trends are both resources for higher education as well as forces shaping its contours.

Governments are leveraging disinformation and propaganda.

Impact: With the polarizing 2016 U.S. presidential election and the start of the COVID-19 pandemic in 2020, we have seen an influx of misinformation. Technological and connectivity advancements paved the way for a drastic increase in the number of news sources, delivery platforms, and access devices. The volume of inaccurate or misleading stories on social, political, and environmental events remains high, with significant, negative impacts on the public discourse, yet a wide range of actors continue to leverage social media and other channels to disseminate problematic content. With this increase in disinformation, there has been intense scrutiny on media outlets, leading to some action—some social media sites, for example, began implementing steps to crack down on fake accounts and use AI to detect false information. Even with these efforts, trying to identify and regulate misinformation will be continue to be difficult, given the ease of spreading it. As a result, higher education institutions are increasingly coming to recognize the need to foster information literacy across the students and communities they serve. Most colleges and universities, however, have not yet been able to provide more than limited information literacy offerings at best. Furthermore, faculty face challenges in teaching these issues due to concerns about potential accusations of political bias, negative student evaluations of teaching, and increased conflict in class. Institutions need to incorporate information literacy as a main component of the undergraduate curriculum while providing students and faculty with the tools and support they need to have meaningful conversations about these issues.

Evidence: Times Higher Education offers resources that can be used to equip students, academics, and the public with the tools to tackle misinformation. The State University of New York at Buffalo launched its Center for Information Integrity, at which a team of multidisciplinary researchers are working to fight online disinformation.

Nationalism is rising across the world.

Impact: Major political events, immigration and border issues, COVID-19, and more recently the "woke" and "anti-woke" culture wars facilitated by social media have fueled tension. Authoritarian governments have emerged in some countries, while existing authoritarian regimes in others have become more extreme. Political disagreements appear increasingly likely to give way to political conflicts, hate crimes remain a significant and in some cases a growing problem, and both sides of the political spectrum consider themselves dismissed and denigrated by the other. In higher education, we've seen a number of concerning impacts related to these trends. On campuses, the impacts go beyond just threats to freedom of speech. Academic freedom, public investment in higher education, and governance and management are all being threatened. In some states, legislators and governors are attempting to restrict the content of research and teaching, academics and administrators have been fired and/or incarcerated, science is being questioned, and the number of international scholars and students has fluctuated greatly in the face of visa restrictions and perceptions of a hostile sociopolitical environment in the United States. Public colleges remain at greatest risk since they are governed and funded by state officials who may hold negative views regarding academic culture and who might seek to impose solutions to what they see as problems via policy mandates and funding restrictions. Institutions will need to respond collectively, leveraging their stakeholders and forming national and international coalitions to help policymakers and the average citizen alike understand the vital importance of academic freedom and core values such as diversity, equity, and inclusion as benefits that higher education generates for society at large.

Evidence: An English professor at Palm Beach Atlantic University said his teaching contract has been put on hold after complaints that he was indoctrinating students during his lectures on racial justice. Gov. Ron DeSantis signed legislation ordering Florida state colleges to publicly share the textbooks and instructional materials required for "at least 95 percent of courses" offered in an academic term.

Political party conflict is increasingly blocking decision-making and action in the U.S. political system.

Impact: Control of Congress is once again divided between the parties, likely producing legislative gridlock on many issues, including education policy, through the 2024 election cycle. Higher education may see progress in areas that tend to have bipartisan support, though, such as workforce development proposals that focus on jobs skills and technical training, supported with funding for apprenticeships, employer education benefits tax breaks, and Pell Grants for programs that are too short to otherwise qualify for such grants. However, Congress will likely continue to be gridlocked when it comes to issues such as conventional forms of financial aid and federal funding. In some states, officials and legislators have initiated a federal lawsuit seeking to have federal election control revert solely to state legislatures, contrary to long-standing legal precedents. Some public colleges could face more legislation from the state level that would limit academic freedom and the ability of institutions to effectively address key social and historical dynamics, though the possibility of seeing such efforts translated to the federal level is daunting. If institutions continue to see aggressive efforts at the state level to direct institutional policy and practice, extending even into the teaching of specific subjects, we could see unprecedented impacts in the areas of academic structures, academic freedom, parental rights, and equal opportunity policies, in addition to larger impacts on the educational workforce. As these factors continue to take shape, institutions will need to be ready for federal higher education policy to be largely at a standstill—and prepare to adapt and find alternative solutions when it comes to issues like funding and student costs and debt.

Evidence: As Congress continues to be limited in its ability to pass legislation, the U.S. Department of Education will begin to tackle regulatory priorities including accreditation, Title IV, third-party servicers, and distance education. The American Council on Education and PEN American developed a resource guide that helps equip higher education leaders with ways to respond when questions are raised about what's being said and taught on campus or when limitations on academic freedom are proposed.

FURTHER READING

News Literacy Project
"Do You Have an Eye for Credibility?"

State Higher Education Executive Officers Association
"State Priorities for Higher Education in 2023: Survey of SHEEOs"

Inside Higher Ed
"Here's What the Midterms Mean for Higher Education"

KEY TECHNOLOGIES & PRACTICES

The *Horizon Report* identifies "key technologies and practices" that are anticipated to have a significant impact on the future of teaching and learning. We include both technologies and practices because we know that while innovations and advancements in technological capability create new opportunities, it's often the pedagogical practices or the development of institutional capabilities that offers the most potential as change drivers.

Sometimes we see an emphasis on the technology itself, such as XR, analytics, or AI. Other times, panelists prioritize practices like the elevation of instructional design or the shift from remote teaching to quality online learning. And often we see a combination effect where the potential of a new technology is extended through intentional practice or where the adoption of a practice requires technology investment.

In 2023, the panel discussions included all of these variations of emphasis on technology, practice, or their combination. Panelists discussed increasingly sophisticated AI technologies that can generate content or be applied to personalize learning through predictive analytics. They identified student-focused practices, including the need to support students' sense of belonging and connectedness and the potential of the HyFlex learning modality to offer increased flexibility to students. Discussions also centered on the increased blurring of boundaries between learning modalities and the implications of this for teaching and learning. And finally, the discussion of microcredentials, a topic that has appeared in the *Horizon Report* for the past several years, increasingly reflected the cross-institutional collaboration needed to build the institutional capabilities needed to scale microcredentials programs, as well as the growing diversity of applications for microcredentials and the partnerships between industry and campus.

In addition to panelists' contributions of ideas about the key technologies and practices that are expected to impact higher education teaching and learning, we also invited reflection about how these technologies and practices are related to several aspects of their implementation:

- Professional development or training required
- Potential to impact issues of equity and inclusion
- Potential to impact learning outcomes
- Potential to impact institutional strategic goals
- Risks involved with adoption
- Receptivity of learners and instructors
- Level of institutional spending required

In this way, we asked the panelists not simply to identify what might be impactful but also to anticipate just what that impact might be. Instead of presenting the results in charts as in past reports, both the quantitative and qualitative inputs from panelists are interwoven into the essays themselves.

AI-Enabled Applications for Predictive, Personal Learning

Generative AI

Blurring the Boundaries between Learning Modalities

HyFlex

Microcredentials

Supporting Students' Sense of Belonging and Connectedness

The Difference between Generative and Predictive AI

Panelists voted both "generative AI" and "AI-enabled applications for predictive, personal learning" into the top six technologies and practices poised to impact the future of higher education teaching and learning. But what exactly is the difference between generative and predictive AI?

In short, generative AI uses deep learning techniques such as neural networks to create text, sounds, and images that mimic human creations. In higher education, emerging uses for generative AI include instructional content, automated assessment feedback, and basic support services. Predictive AI uses basic statistical algorithms to analyze historical data and make predictions about new data. Applications of predictive AI in higher education include personalized learning platforms, enrollment management, student success, and student advising.

AI-ENABLED APPLICATIONS FOR PREDICTIVE, PERSONAL LEARNING

Overview

Advances in predictive AI continue to inform the design of personalized learning tools. The promise of AI-enabled applications is that they might facilitate a transition from "one size fits all" technology to scalable implementations of personalized learning experiences. Further, many of these tools are designed to offload the most time-consuming elements of teaching, such as writing assessments, providing students with formative feedback, and making minor grammatical corrections. Spending less time on these tasks should give faculty more time to engage with students directly, tackling more challenging pedagogical tasks such as synthesizing and analyzing information and creating new knowledge. Finally, without a need to sleep or have a personal life, AI-powered tools might be a key component of "on demand" higher education models. Students can leverage these tools during times when faculty and staff are simply not available.

AI-enabled applications might also be useful for satisfying institutional demands for data-informed practice. Panelists suggested that recent progress in institutional digital transformation and the increased adoption of AI for research are making it easier for faculty to access and adopt AI tools for teaching. Chatbots, tutors, and personal coaches can be available for real-time, one-to-one assistance. Assessment and feedback tools can catalyze formative assessment processes. Faculty remain concerned about the accuracy of applications built with predictive AI, and they are even more concerned about the extent to which students and other stakeholders unconditionally trust AI outputs. Some posit that this is cause for banning AI-powered technologies, but others see this as an opportunity to teach students how to use them prudently.

Ethical debates are ongoing over how predictive AI tools should be used, what kinds of stakeholder data should be collected and stored, and how those data should be used, but most educators agree that they have a responsibility to use emerging technology to improve teaching and learning.

AI-enabled tools have the capacity to collect and process the large volumes of data being held in institutional silos, data that might otherwise never generate meaningful insights. Further, these tools can transform disparate data into holistic insights. However, challenges related to data governance and a lack of best practices related to using AI and institutional data for such purposes remain steadfast roadblocks for widespread adoption.

Relevance for Teaching and Learning

The work of teaching. The day-to-day work of faculty and staff would look very different if they fully adopted AI-enabled learning tools. Spending more time on higher order thinking and collaborating would necessitate a change in the ways faculty are trained and supported by their institutions.

Learning management systems. Educational technology powered by AI has the potential to drive new types of competition among LMS providers. Major LMS companies are already providing integrations for AI-enabled software, and this trajectory is only expected to continue. Eventually, LMS platforms that are fully supported by AI could become the new standard.

Student services. It seems like every major service in our daily lives now offers 24/7 customer support via a chatbot (with widely variable levels of actual support). Traditional student services such as IT help desks are also being supplemented with such technology. As these tools become more accurate and helpful, they could be adopted by units across the institution to streamline students' access to basic information and troubleshooting.

AI-Enabled Applications for Predictive, Personal Learning in Practice

LearningClues: Personalizing Student Help-Seeking through Artificial Intelligence–Powered Video Analysis

The learning environment for most STEM college students includes a menagerie of educational platforms including, but not limited to, a learning management system (LMS), an e-textbook, lecture capture, and adaptive learning systems. The LearningClues Project uses artificial intelligence to mine what was said or visually presented during class sessions and automatically create links to pertinent resources in other educational platforms in a student's learning ecosystem. Based on class discussion, students will be provided links to relevant pages in their textbook, documents in their LMS, and other resources the instructor has made available.

Purdue's "Charlie": An AI-Enabled Writing Assistant

Purdue has developed "Charlie," an AI assistant for providing instant, "preflight" feedback to students submitting essays for writing-intensive courses. Trained on large, instructor-graded corpuses of essays, Charlie provides instant feedback, predicting outcomes according to an assignment's rubric criteria. Students can revise and resubmit repeatedly, giving them an opportunity to reflect and get assistance as needed before the assignment deadline. Charlie also points them to helpful resources.

Career Highways: An AI Approach to Student Career Mapping

The Minnesota State IT Center of Excellence, with STEM Fuse, launched Career Highways throughout the state in fall 2022. This service allows students to attach work products, learnings, and credentials. These are mapped through AI to current job openings and career "highways" they can explore. The service also allows hiring managers to see students/participants who fit their career description and reach out to those who have a Career Highway profile.

Improving Persuasive Oral Communication Skills Using PitchVantage and VirtualSpeech

Sacred Heart University's Welch College of Business & Technology uses an AI-based platform (PitchVantage) and a virtual reality platform (VirtualSpeech) in introductory marketing courses to improve students' oral communication skills. Students practice and receive immediate and personalized feedback from AI within the VR-based environments in order to improve their persuasive oral communication skills in presenting compelling points of view on analyzing real-world business cases.

AI for Personalized Adult Learning and Online Education at Scale

Funded by the National Science Foundation, the National AI Institute for Adult Learning and Online Education (AI-ALOE) aims to lead the development of AI theories and techniques for enhancing and transforming online learning for adult learners in effectiveness, efficiency, access, scale, and personalization. The institute has developed and deployed a collection of five AI technologies in classes to create engaging and personalized learning experiences and improve learning outcomes at scale.

Data-Driven Personalized Feedback at Scale

OnTask uses data insights and artificial intelligence to drive the provision of personalized feedback. The project, led by the Centre for Change and Complexity in Learning at the University of South Australia, was developed to support instructors' use of learner datasets to create personalized feedback support. Several institutions have since adopted the open-source tool, with studies showing the significant impact OnTask has on student learning through personalized feedback.

FURTHER READING

eCampusOntario
"Adaptive Learning"

Times Higher Education
"Personalised Learning in Higher Education: Laying the Foundations"

Future of Life Institute
"The Artificial Intelligence Act"

GENERATIVE AI

Overview

Generative AI has been identified by many higher education experts as one of the most disruptive technologies of our time. With the potential to create text, images, and sounds in ways that sometimes convincingly mimic human creation, this technology has the potential to impact instructional materials, assessments, and more. The revolutionary potential of generative AI extends beyond the classroom. Faculty and staff could use generative AI tools to write proposals, generate reports and manuscripts, and translate their work for global audiences. In all contexts, proponents of generative AI claim that the technology will enable people to offload mundane tasks and get "unstuck" when tackling big, complex problems.

Certainly, the rise of generative AI has come with concern and controversy. Generative AI tools could be even more insidious than other AI technologies at reinforcing the human biases that result in inequitable systems. Some of the most vigorous objections to using generative AI in higher education are related to academic integrity. Stakeholders argue that students will primarily use generative AI to cheat on course assignments and assessments, and some even claim that generative AI will lead to the end of creative expression and individual thought. In contrast, others assert that generative AI will force educators to reimagine assessment, leading to more meaningful and effective educational experiences. Further, educators argue that it is only a matter of time before a variety of industries adopt generative AI tools and that students should be proficient in these tools before joining the workforce. In particular, educators worry that if students do not learn about the limitations and ethical implications of generative AI (and AI tools more broadly), they may be susceptible to misinformation and inappropriate reliance on generative AI outputs.

Relevance for Teaching and Learning

Reimagining assessment. Curriculum experts have long argued that higher education needs better assessment practices, targeting higher order thinking and analysis, providing learning opportunities rather than focusing on punitive measures, and supporting our diverse body of students. As technology advances in ways that make basic information retrieval available to us at all times, assessing students' ability to memorize and repeat information is arguably obsolete. Generative AI presents an opportunity for educators to challenge mainstream assessment practices and shift their focus on students' abilities to practice higher order skills such as analysis and evaluation.

Ethics education. Students are increasingly comfortable living in a digital world, but few understand the complexities involved in the development of technology, especially when it comes to AI. Generative AI exacerbates ethical AI debates because its outputs can be convincingly human. Higher educators have a responsibility to prepare students to interact with generative AI technology ethically and responsibly.

Generative AI in Practice

MIT App Inventor

MIT App Inventor is an intuitive, visual programming environment that allows everyone to build fully functional apps. This blocks-based tool facilitates the creation of complex, high-impact apps in significantly less time than traditional programming environments. The MIT App Inventor project seeks to democratize software development by empowering all people, especially young people, to move from technology consumption to technology creation.

Future-Focused Digital Marketing

The future-focused digital marketing was introduced as a new module in the MBM Digital Marketing Strategy course emphasizing the role of cutting-edge technologies for customer engagement and business growth. The modular content and activities are structured around the metaverse and AI-empowered data analysis, content creation, and customer engagement. Such an approach helped illustrate the trends in digital marketing and the role of forward-thinking professionals in the ever-changing field of digital marketing.

VR Meets AI Meets the Matrix: Using Embodied Conversational Agents for Experiential Learning

This kinesiology course enables students to correctly take physiological measurements by using virtual reality to interact with a "smart" artificial agent playing the role of a potential client. A motion capture system recorded personalized movements for the artificial agent. A custom Google NLP API connected to Unreal Engine allowed students to have realistic conversations with the "digital human." The course has been tested by 83 students and 4 faculty members.

Empathy Chatbot

A team at Western University has developed a chatbot that is designed to mimic a patient–provider dialogue using the five skills of an empathetic conversation. This technology-enhanced teaching tool supports student learning through an artificial intelligence natural language processing (NLP) platform. As students prepare for the Objective Structured Clinical Examination (OSCE), the chatbot (preloaded with patient case scenarios) plays the role of the patient, while students can practice being the medical provider.

AI-Augmented Mental Health Counseling

A collaborative faculty and student research team at Grand Canyon University developed an AI tool called the SenSym system that uses sentiment analysis to help diagnose mental health conditions. It is based on DSM-5 guidelines and replaces in-person meetings with counselors with the analysis of patients' personal journals. The system prepares an initial evaluation of a patient's condition using extracted sentiments from their text, for clinician's review. It is scalable and can reduce the workload of clinicians by engaging multiple patients simultaneously.

Preserving and Expanding Access to the Records of Japanese Americans Incarcerated during World War II

As part of a Japanese American Confinement Sites (JACS) grant-funded project, supported by the National Park Service, the Bancroft Library at UC Berkeley digitized nearly 210,000 pages of War Relocation Authority (WRA) Form 26 individual records of Japanese Americans incarcerated during WWII. The library partnered with Doxie.AI to develop a customized machine learning pipeline for extracting structured data from these records to support future computational scholarship.

FURTHER READING

Slate

"The Real Threat from A.I. Isn't Superintelligence. It's Gullibility"

Inside Higher Ed

"Machines Can Craft Essays. How Should Writing Be Taught Now?"

University of Southern California

"USC Dives into AI Research, Education with New Center for Generative AI and Society"

BLURRING THE BOUNDARIES BETWEEN LEARNING MODALITIES

Overview

Horizon panelists agreed that modality definitions are a moving target, as the distinctions between them are increasingly blurred. Faculty and staff continue to grapple with finding clear, widely accepted definitions for various learning modalities: face-to-face, on-site, in-person, blended, hybrid, HyFlex, online, remote, distance, and more. Can an online course with on-site exams really be considered online? With a laundry list of instructional elements residing in the LMS, are most on-site courses actually hybrid? As educational technology evolves to meet students' needs in a hybrid world, the very concepts of course location and mode are expanding.

The wide range of modalities available to educators today could be a powerful tool. With a cross-modality approach, it's possible to design learning environments that engage students in multiple ways, speak to the needs of diverse groups of students, align with a range of instructional goals, and remove geographic boundaries between learners and experts. The challenge lies in bringing together multiple stakeholders, institutional policies, and appropriate instructional supports. Transforming instructional modalities has far-reaching implications, and getting everyone on the same page is no small task.

The blurring of boundaries between instructional modalities presents another central challenge. Though instruction offered in multiple modalities can support equity and inclusion goals, it can also hinder them. Some students still lack reliable access to hardware and software, high-speed internet, and physical spaces appropriate for learning. Advancements in the use of educational technology that are not accompanied by commensurate improvements in access in infrastructure will only widen the current digital divide.

Relevance for Teaching and Learning

Common language. Without common language to describe learning modalities, discussion between and even within institutions can be challenging. Establishing clear and agreed-upon definitions for various learning modalities helps faculty design their courses and find the right types of support (e.g., instructional technology, instructional design, faculty development). As students and faculty become more savvy about which modalities are best suited to meet their educational and personal needs, they will need to have the language to discuss, design, and choose the right course options.

Adopting and scaling new technologies. Today's instructional modalities already demand a high level of access to instructional technology that facilitates remote engagement, and they will continue to do so. Even as we struggle to provide all students with access to reliable devices and high-speed internet, new modalities necessitate scalable solutions for students to be able to access virtual presence technology such as VR headsets and telepresence technology such as robots. As we see ongoing adoption and scaling of new and more advanced remote technologies, support for students' access and use must remain at the forefront.

Blurring the Boundaries between Learning Modalities in Practice

Design Forward

Design Forward is a community-based professional development series that helps faculty learn and think critically about instructional design. The "Formats and Modalities: Online & Beyond" module approaches modality as a continuum, empowering faculty to think about affordances and challenges and resist binary thinking about online teaching.

Multimodality Master Course Design: Promoting Empowerment, Efficiency, and Ease of Delivery

Sinclair Community College offers courses in asynchronous online, synchronous online, blended, in-person, competency-based, and face-to-face modes and designs master courses for each and their varying lengths. This process became tedious following the scaling of e-learning modes following the outbreak of COVID-19. Sinclair transitioned to designing multimodality master courses to reduce the burden of overseeing multiple master shells. This strategy maintained high quality, reduced costs, and empowered faculty in course delivery.

The Next Best Thing to Being There!

The MBA program at the Weatherhead School of Management at Case Western Reserve University is highly relational and incorporates small-group work in the classroom. Coming out of COVID-19, some students and other people remained uncomfortable returning to in-person classes. The telepresence robot pilot was our response to folding those students into an on-campus classroom in a more meaningful way than having them be often forgotten about and marginalized "TV" students attending via Zoom.

Team-Based Learning in HyFlex Courses at Central Michigan University

At Central Michigan University, HyFlex design was adopted during COVID-19 to ensure learning flexibility. Students could choose to attend on-campus or in online interactive sessions. However, maintaining continuous student engagement was challenging. Michelle Steinhilb then took an innovative approach in her HyFlex biology course, implementing technology-enhanced team-based learning. Two tools from FeedbackFruits, Team Based Learning (TBL) and Group Member Evaluation, were used to activate students' collaboration and autonomy during the TBL activity.

Developing Multimodal Learning Spaces at Hunter College and the City University of New York

Over the past several years, Hunter College and the City University of New York have created numerous multimodal learning spaces at different scales for different uses with varying degrees of integrated technology. Each space facilitates a variety of traditional, active, asynchronous, HyFlex, and/or flipped learning modalities. Projects include a pair of 48-seat learning studios, a 325-seat auditorium, and a 24-seat teaching laboratory.

The Practical Project: A Viable, Authentic Online Alternative to On-Site Practicum Placements

At the onset of the pandemic, leaders at Robertson College anticipated a challenge securing on-site practicum placement sites for students in our diploma programs. The successful completion of a practicum is required for graduation. Robertson developed 21 authentic online, program-specific practical projects so students could graduate on time and enter the workforce. The content and visual design of these projects emulated a workplace environment and were facilitated by professionals in the applicable field.

FURTHER READING

Postdigital Science and Education
"#OurPlace2020: Blurring Boundaries of Learning Spaces"

Every Learner Everywhere
Planning for a Blended Future

University of South Dakota
"USD's David De Jong Finds Telepresence Robots to Be Successful in the Classroom"

HYFLEX

Overview

Learning modality has been one of the most prominent issues in higher education since the start of the COVID-19 pandemic. Along with that, the HyFlex modality has been the subject of much discussion. Importantly, HyFlex is not to be confused with other co-modal instructional approaches. HyFlex specifically refers to a course mode that gives students the flexibility to choose between on-site and online instruction within the same course. Importantly, students in a HyFlex course have the flexibility to move between modalities throughout the course as needed. The temporal dimension of online instruction offered in a HyFlex course may vary; some institutions offer both synchronous and asynchronous modes for HyFlex courses, and some institutions only offer one of those options. As long as students have the freedom to choose between on-site and online experiences in the same class, and move between those modes freely, then the course is considered HyFlex.

Many educators believe that the HyFlex modality has the potential to dramatically improve access to higher education, not only for "traditional" students but also for lifelong learners interested in upskilling for career advancements, reskilling for career shifts, or just seeking new knowledge and skills for personal growth. Though the theoretical potential of HyFlex to support students is undeniable, the practical implications of designing, teaching, and supporting such courses act as barriers to authentic implementation. Skeptics propose that higher education leaders interpret HyFlex to mean "maximum flexibility," without guardrails to maintain quality and efficacy. Some suggest that such barriers make it impossible to offer HyFlex courses in a way that is inclusive and equitable for all students.

Relevance for Teaching and Learning

Flexibility. Perhaps interest in the HyFlex modality points to a higher-level concern—the urgent need to make higher education more flexible for students who are juggling so many competing priorities in the modern world. Without the resources needed to implement HyFlex with fidelity, faculty and staff might look to the HyFlex model for inspiration when designing flexible courses.

Learning first. The design of HyFlex courses also elevates the idea that learning is the primary purpose of higher education by removing logistical barriers to course engagement. In any modality or combination of modalities, in any course of degree program, design elements should focus on advancing students' learning.

HyFlex in Practice

Increasing Community in a HyFlex Class during COVID-19

The transition to hybrid online HyFlex classrooms led to student difficulty creating personal connections with their peers, collaborating on schoolwork, and engaging with the instructor. The focus of this project at Minnesota State University Mankato is to close these gaps using conferencing technology and using professional learning committees in innovative ways.

NTU HyFlex: Piloting a Flexible Learning Approach with NTU Psychology

The Nottingham Trent University (NTU) Centre for Academic Development and Quality (Flex Team) and NTU Psychology have collaborated to develop a bespoke HyFlex approach for module delivery, providing students with the flexibility to choose their mode of learning between in-person/live and on-demand/asynchronous engagement opportunities. The approach is currently being piloted by two large-scale undergraduate modules in NTU Psychology: Statistics 1 (N = 880) and Social Psychology (N = 650).

Gamify HyFlex Learning with Digital Escape Rooms: A Case in China

Na Li and her team gamified the HyFlex classes using the H5P and Moodle-assisted digital escape rooms and improved student engagement for synchronous and asynchronous online learning. The innovation was first piloted in a postgraduate teacher professional development program with high learner satisfaction. Over two years, it has been adopted by several credit degree courses at an international university in China. Research findings prove its effectiveness.

Putting HyFlex on Wheels: Enabling Synchronous Courses for Simultaneous Participation by On-Campus and Geographically Remote Students

Blended learning technology and thoughtful pedagogy are keys to a successful HyFlex model. Remote participation in a live classroom setting is being embraced and expected by students, especially to enroll geographically distant learners. However, enabling this by undertaking permanent AV classroom renovations is costly, time consuming, and logistically challenging. The Portable HELIX Classroom, an alternative solution to fixed renovations, provides flexibility to offer high-quality hybrid experiences in an affordable, "pop-up" manner.

HyFlex Supplemental Instruction: Making Academic Support Available to All

The HyFlex approach to offering courses with the option for delivery model choice for students has developed over time within a variety of universities and colleges. However, delivery of academic support within the HyFlex approach is still novel and new, creating a dimension where the flexibility of course content delivery is not aligned with the same flexibility in academic support modalities. UMass Amherst's Learning Resource Center, home to a thriving Supplemental Instruction (SI) academic support program, sought to pilot HyFlex SI to parallel HyFlex courses. To create this flexibility of academic support, a strategic partnership was formed with the UMass IT Instructional Design, Engagement, and Support (IDEAS) team.

Designing and Building a Classroom Technology Infrastructure: Getting Classrooms, Faculty, and Students Ready for HyFlex

Through an institution-wide collaboration and based on proofs of concept, Lehman College (CUNY) developed the classroom technology standards and guiding principles for enhancing teaching and learning spaces with contemporary equipment and software. With lessons learned from the pandemic, HyFlex capabilities were added to the final design. This project included the upgrade of 172 standard classrooms and 4 lecture rooms, all networked and connected to an audiovisual management system.

FURTHER READING

YouTube
"An Introduction to HyFlex"

HyFlex Learning Community
"What's in a Name?"

EdSurge
"Is Higher Ed Really Ready to Embrace Hybrid Learning?"

MICROCREDENTIALS

Overview

Microcredentialing and microlearning offer an attractive option for building personalized, flexible learning pathways. Flexibility has been an essential consideration for education since the start of the COVID-19 pandemic, as learners and workers seek work–life balance. Further, economic challenges are motivating students to examine the ROI of higher education. This means that students are concerned about not only the cost of education but its efficiency as well. More students now work while attending school, and many have family or other caretaking responsibilities also competing for their time. From K–16, to professional training and advancement and even personal development, microcredentialing allows learners to achieve their goals in ways that fit their lives.

Technology advancements are also facilitating a renewed interest in microcredentialing. For example, tools that enable the clickable creation of digital content do not require any coding expertise. Teachers are able to create new digital instructional materials without deep expertise in creative tools. Online learning platforms are expanding access to education via remote and hybrid modalities, providing a wider range of engagement options for students and teachers. The general public is beginning to gain a better understanding of what nonfungible tokens (NFTs) are and how they can be used beyond an investment strategy. Blockchain technologies are designed to support autonomy and security. Any student can receive acknowledgement for completing learning experiences, and with NFTs they can have unrestricted access to their microcredentials, making them fully portable and permanent. All of these tools are democratizing the processes for creating and consuming pedagogical content.

Even with all of these advantages, we have yet to see microcredentialing fully accepted by mainstream higher education. In part, this could be due to accreditation agencies lagging behind institutions in standing up required policies, best practices, and other resources. A larger challenge lies in workforce norms. Though employers seem to be shifting toward competency-based hiring and more support for professional development, which would increase the value of microcredentials in the workforce, the majority of employers still seek workers with traditional degrees and certifications. Thus, the future of microcredentialing in higher education likely depends on the extent to which various stakeholders can find common ground.

Relevance for Teaching and Learning

Microlearning. Learners of all ages can be found opting in to informal learning experiences on social media sites that are designed to offer short-form lessons on a wide variety of topics and skills relevant to daily life. Educators can leverage the same principles to meet learners where they are, using microcredentials to bring legitimacy to nontraditional learning experiences. If microcredentials find widespread adoption, they could revolutionize not just the way learners get credit for their work but also the very approach educators take to teaching itself.

Lifelong learners. Microcredentials could also play a role in changing the relationship learners have with higher education institutions. Learners could look to institutions for learning beyond or instead of the traditional degree. Workforce preparation, basic life skills, personal interests, ongoing professional development, and more could all be offered by higher education institutions. In this way, learners can have lifelong relationships with one or multiple institutions.

Customized learning experiences. In-degree microcredentials offer targeted, industry-specific workforce preparation for students so that graduates are immediately ready for the workforce. Such credentials can also be used to offer greater variety in degree programs, giving learners options to match their experiences to their interests and needs. Professional learning microcredentials allow workers to engage in highly specific, targeted topics rather than spending unnecessary time learning about topics that are either uninteresting to them or irrelevant for their work.

Microcredentials in Practice

Wellspring Initiative

Wellspring is a multiyear initiative that demonstrates how to bridge the gap between learning and work using open standards to form a virtual talent network. The initiative connected educators and employers to determine what skills learners need to be successful in job roles. The demonstration project then issued verifiable credentials for learning and workplace achievements in a digital wallet so everyone can own and share their hard work with recruiting and application tracking platforms. Wellspring seeks to point the way by leveling the playing field for skills-based hiring with a low-bias, learner-controlled, data-based approach.

Skills for Success

Alabama's community colleges literally meet residents and businesses "where they are" through the ACCS Innovation Center's new, no-cost Skills for Success rapid-training program. Residents can train online and on-site for in-demand career fields to obtain industry-recognized microcredentials. The credentials—built in collaboration with community colleges for business, by business—signal preparedness to businesses while setting a foundation to stack on credentials as students progress toward a traditional college experience.

The Whole Learner: Recognizing A Lifetime of Learning Using Digital Credentials

The Minnesota Learning Commons (MnLC) 2022–23 project "The Whole Learner: Recognizing a Lifetime of Learning" is investigating the use of digital credentials to support lifelong learners. A collaboration between the University of Minnesota, Minnesota State, and the Minnesota Department of Education, this initiative is exploring the application of digital microcredentials across Minnesota's educational systems through a series of pilot projects inspired by the concepts of the 60-Year Curriculum.

Tracking Complex Competencies and Learning Objectives Attainment across Study Programs

Colleges and universities are increasingly using competency-based assessments to evaluate students' achievement of complex skills and capabilities. The Centre for Change and Complexity in Learning at the University of South Australia developed an AI system for assessing the mastery of leadership skills across a study program for employees of a global partner organization. The work demonstrates how AI can automate assessment of complex capabilities and personalize support practices to improve attainment.

Prep Course for Experiential Learning Activities

The Information and Communications Technology Council (ICTC) manages a Work Integrated Learning (WIL) program for postsecondary students funded by the Federal Government of Canada. Employers who provide learning experiences are eligible to receive a wage subsidy of up to 70% of the student salary. To improve the student experience and the learning outcomes, ICTC developed microcertifications (about 20 hours of instruction). Students develop deeper connections with their colleagues, which leads to better chances of employment after graduation.

UTeach Maker: Personalized Microcredentialing for STEM Preservice Teachers

UTeach Maker is an innovative microcredentialing program developed by UTeach, the secondary STEM teaching licensure pathway at The University of Texas, Austin. The program supports STEM preservice teachers interested in integrating creativity, design, and fabrication into K–12 classrooms and learning environments. The UTeach Maker microcredentialing model includes specific design features that allow for both rigor and responsiveness to individual participant needs.

FURTHER READING

Inside Higher Ed
"Higher Ed Curricula—the Short Game"

Journal of Learning for Development
"The Global Micro-credential Landscape: Charting a New Credential Ecology for Lifelong Learning"

Global Educational Supplies & Solutions
"3 Ways NFTs will Disrupt the Education Sector"

SUPPORTING STUDENTS' SENSE OF BELONGING AND CONNECTEDNESS

Overview

College students who feel a sense of belonging and connectedness at their institutions are better equipped to trust peers, faculty, and staff. This sense of safety at school leads to better educational outcomes related to learning, retention, and degree completion. Students who lack a sense of belonging in higher education tend to withdraw and avoid engagement. This decreased engagement in both academic and nonacademic activities is associated with negative educational outcomes. In both cases, students' sense of belonging and connectedness is part of a cycle. Positive affect begets positive outcomes, which reinforce the initial positive affect, and so on. The same is true for the cycle of negative affect and outcomes. In this way, it is crucial for students to feel belonging and connectedness before a pattern is established; disrupting a negative cycle can be an insurmountable task.

Supporting students' sense of belonging must begin even before their first day of classes. Every transitional period in a person's life presents new opportunities for them to either connect or disconnect. New roles and responsibilities, environments, and people can all contribute to an individual's feeling either that they have new ways to experience the world with others or that they do not belong in these new situations. In higher education settings, faculty and staff can support students by recognizing and acknowledging ways in which their individual strengths, goals, and challenges fit into the bigger picture of life and learning at their institution. An emphasis on mentorship, coaching, and community will facilitate students' transitions into (and within) institutions. In this way, we can support students' development of reconstructed identities that include their roles in higher education.

Relevance for Teaching and Learning

Learning sciences. The energy around supporting students' sense of belonging and connectedness presents an exciting opportunity for educators to focus on learning science. Educational research can aid faculty and staff as they look for tangible ways to support students. Even beyond that, faculty and staff can leverage interest in research related to belonging to expand pedagogical conversations to other research-informed topics.

Communicating with students. Supporting students' sense of belonging and connectedness should happen in all areas of the institution. Faculty should emphasize students' strengths and abilities to learn, rather than focusing on the difficulty of course content or likelihood of failure. Other institutional stakeholders who interact with students (e.g., advisers, coaches, tutors) should provide unsolicited support such as notes of encouragement and appreciation.

Concrete objectives. In any situation where students are asked to accomplish a task, they should know what their objectives are and how they will be evaluated. Information provided to students should be concrete and observable so that students do not feel they are working toward ambiguous or even unattainable outcomes.

Supporting Students' Sense of Belonging and Connectedness in Practice

Reimagine Descriptive Workflows

Various cataloging practices are part of a powerful labeling process in library catalogs. Such metadata includes outdated and racist terminology that causes harm and contributes to the mischaracterization of experiences, memories, and achievements of communities, impacting students who feel disconnected from the library and library collections. Our project addresses these harmful practices through a convening with a diverse group of practitioners and community members to determine ways of improving descriptive practices, tools, infrastructure, and workflows, exploring opportunities for reforming our systems and charting a path toward implementation of antiracist and inclusive language in library catalogs.

Professors at Play PlayBook

The Professors at Play PlayBook challenges the idea that play is only for kids and presents a case for play and its value in higher education. The PlayBook describes how the use of playful pedagogy reduces barriers to learning, creates connections, and awakens student interest and engagement. Offering a collection of real-world examples, the PlayBook provides tested patterns for bringing fun back to the classroom and elevating student performance.

Achieving Equity through Humanized Online Teaching

Humanized online teaching is an instructional model that blends culturally responsive teaching and psychologically inclusive course design to foster belonging in digital environments. This grant-funded project has produced an evidence-based and openly shared online professional development program, the Humanizing Online STEM Academy, that institutions can adopt for free. The academy prepares faculty by honing their digital fluency through the creation of a Liquid Syllabus, Wisdom Wall, bumper videos, microlectures, and more.

CSU: Cultivating a Thriving and Inclusive Community

Colorado State University (CSU) has implemented intentional initiatives to meet the university's strategic imperative of "Cultivating a thriving and inclusive community." To enhance student success, students' sense of belonging and connectedness, and mental health and well-being, two model programs have been launched: the Diversity, Inclusion and Belonging (DIB) module and YOU@CSU, a student success portal offering personalized online assessments, goal-setting tools, mental health and well-being skill-building, and referrals to campus resources.

Pronoun Collection and Usage

The Portland State University (PSU) community identified a need to collect and display pronouns in academic spaces. PSU's Office of Student Success and Office of Information Technology partnered to implement a centralized system in which students, staff, and faculty may provide free-form pronoun information to share through course rosters, the LMS, and the faculty/staff directory. This project's goal is to create a culture of inclusion through the sharing and usage of correct pronouns.

Active Learning Academy: Implementing The Student Experience Project

UNC Charlotte is one of six access-oriented universities participating in the Student Experience Project, which guides professors in implementing data-driven best practices to increase seven learning conditions that have been identified as crucial to the retention and success of all students, with a measurable impact on the retention and success of students belonging to traditionally underrepresented and structurally disadvantaged groups. These conditions are Belonging Certainty, Identity Safety, Self-Efficacy, Social Belonging, Social Connectedness, Institutional Growth Mindset, and Trust and Fairness. Using evidence-based surveys and instructor strategies identified by PERTS (Project for Education Research That Scales), more than 2,000 students have been impacted by this project in fall 2022 alone. Data indicate that these strategies can improve learning conditions, including belonging certainty, social connectedness, and social belonging, not only for F2F learners but also for those enrolled in some online, asynchronous courses.

FURTHER READING

Learning & the Brain
"The Psychology of Belonging (and Why it Matters)"

Mindset Scholars Network
"What We Know About Belonging from Scientific Research"

Advances in Developing Human Resources
"Developing Competencies for Emotional, Instrumental, and Informational Student Support During the COVID-19 Pandemic: A Human Relations/ Human Resource Development Approach"

SCENARIOS

With the trends we're observing and the technologies and practices emerging around us that are already helping to shape the future, we can begin to imagine how all of these elements might combine and coalesce into larger stories about who we'll be as people and what higher education will be in the future. In this section we offer up several of these larger stories through a series of scenarios that reflect on where these trends and technologies and practices may ultimately lead us in 10 years' time.

To paint these scenarios, we use a forecasting framework from the Institute for the Future (IFTF) to envision four distinct possible futures that each take a different angle on how today might be leading into tomorrow. The first scenario we envision is characterized as Growth, a scenario in which the current trajectories of things today, both good and bad, have continued along their same paths into the future. The second scenario is Constraint, a scenario in which higher education has organized itself around a core guiding value or principle that drives our decision-making and animates our daily practices. In the third scenario, Collapse, we imagine a future in which higher education has experienced a series of breakdowns and widespread changes that ultimately leave many institutions decimated. In the Transformation scenario, a new paradigm has been established within higher education that has led to a fundamental shift in the ways we think about and carry out education.

In creating this year's scenarios, we've focused on several key ideas emerging out of our panelists' discussions as possible defining features of our collective futures. We consider flexibility to be a key feature across several of these scenarios, as either a necessity or a strategy institutions will continue to leverage to survive and even thrive. Through flexibility in our teaching and learning modalities, and flexibility in the ways we structure curricula and credentials, the higher education of the future must adapt to the shifting circumstances and the changing needs and preferences of its students, faculty, and staff. We also consider the emergence of new AI technologies and what they might mean for the future of higher education. With the new capabilities in content generation and the operational efficiencies afforded by these technologies, higher education might find AI to be not only an opportunity for more freedom and time to focus on the most important aspects of education but also a potential competitor vying for some of the same core functions and human activities that make up the foundations of higher education. And finally, across all four scenarios we consider the implications of all the potential changes and opportunities and challenges of the future for equity and inclusion. Our digital futures will demand digital resources and access, and institutions will still have far to go in ensuring all learners have the resources they need and can access the digital tools their education will require in the years ahead.

The scenarios we offer here only represent our *potential* futures, of course. With so much changing around us seemingly on a daily basis, it is impossible to know with any degree of certainty who we'll be and what higher education will be in 2033. The best we can do in the present day is use exercises like these to get better at anticipating and planning and to practice creative thinking about our future, grounded in the best information we have available to us, so that we can be more prepared to face whatever future does eventually arrive.



Growth



Constraint



Collapse



Transformation

GROWTH

The higher education community has embraced rapid and unconstrained growth of flexible degree programs based on hybrid learning modalities and microcredentials.

In the early 2020s, higher education institutions faced pressure on multiple fronts to accomplish more than ever with dwindling resources. A global pandemic, political unrest, and war contributed to an intense period of inflation, with families struggling to make ends meet. At the same time, institutions braced for the impacts of the 2025 Enrollment Cliff and the changing demographics of higher education students. To ensure survival, institutions had to recruit more students, even though the pool of "college aged" adults had grown smaller. The time was right for stakeholders to embrace change.

The COVID-19 pandemic catapulted remote modalities into the forefront of teaching and learning practices more than 10 years ago. Since then, advancements in technology and digital pedagogy have only further blurred the lines between learning modalities. Educators have leveraged momentum in digital transformation to effect long-lasting institutional changes. New degree programs, designed on a foundation of flexibility for students' holistic needs, have proliferated. Hybrid and HyFlex learning modalities provide students with opportunities to learn anything, from anywhere, at any time. Microcredentials enable students to create personalized learning experiences, tailored to their needs and interests. Now, students can truly be lifelong learners, with the ability to integrate workforce preparation, professional learning, and personal development over decades.

The growth in hybrid learning, microcredentialing, and flexible degree programs has not come without a cost. In many geographic locations, current and potential students still lack basic resources such as reliable internet access and affordable hardware. Despite the increased focus on equitable and inclusive teaching and learning in the early 2020s, government entities, communities, and higher education leaders have still not tackled systemic infrastructure inequities. Most institutions prioritize improving profit and financial stability over providing educational opportunities for all. Thus, the digital divide has grown larger. Those who have access to digital resources are thriving as never before, but those who do not have such access have no way to compete for jobs in the digital economy.

The landscape of higher education stakeholders has significantly shifted since the rapid rise and adoption of flexible degree programs. Employers are now partners in the design of degree programs and are even responsible for teaching a large proportion of higher education courses. Further, the granularity offered by microcredentials helps employers match the right workers to the right jobs. However, employers have also failed to invest in critical infrastructure advancements to improve access to digital resources (i.e., less expensive and more readily available internet access and hardware). In most industries, leaders are still failing to support a truly equitable and inclusive workforce. Our society and culture largely revolve around digital life, and without immediate action to expand access, we may find that we are only worsening the inequities we have battled for decades.

CONSTRAINT

The impacts of global climate change have forced higher education to expand flexible degree pathways, assume responsibility for educating students and communities about the climate, and achieve carbon neutrality in daily operations.

Over the past 10 years, climate change has drastically constrained the way higher education institutions operate on a daily basis. Even now, in 2033, technology and society have yet to mitigate our deleterious impacts on our environment, and the effects of climate change on our daily lives are undeniable. Thousands of families have been forced to relocate due to unsafe and unaffordable living conditions. Food, housing, insurance, and transportation costs are constantly on the rise. Meanwhile, our physical and mental health are in decline. Allergy and cold seasons have become prolonged and intense, without any concurrent developments in medical relief, and the unpredictability and severity of extreme weather events is contributing to the highest rates of depression and anxiety in recorded history.

As basic living became increasingly effortful, postsecondary students struggled with institutional policies bolstering inflexible instructional modalities and degree program structures. To retain students, institutional leaders have had no choice but to adopt more flexible practices such as hybrid and HyFlex learning modalities and microcredentialing. Now, educators and employers are collaborating to offer students personalized, cross-institutional learning pathways. These pathways are personalized for each student's survival needs, generally revolving around employment and skills for living in their own climate. We've realized that in today's world, we are compelled to focus on survival and problem-solving. Students do not have the luxury of pursuing full-time study in a breadth of subjects and must focus on the skills they need to improve their lives. Though institutions have evolved to meet students' immediate needs, many stakeholders are concerned that abandoning traditional degree program models will result in a society that lacks the freedom to create, explore, and expand.

Adding to our state of unrest and uncertainty, political leaders continue to wield science as a political weapon. The early 2020s gave rise to extreme polarization in the political landscape, and in recent years this bifurcation has reached previously unimaginable extremes. Politicians promulgate information (and disinformation) that supports the sentiments of their voter base, and they platform propaganda in order to garner favor within their communities. Such extremes do not allow for any meaningful progress in our legal system, and most citizens find it all but impossible to access reliable information about the environment. Thus, higher education is one of the few resources available to communities to learn about climate change and develop strategies to combat it. Now, degree programs ubiquitously include some element of instruction related to climate change policy and action. Perhaps more importantly, institutions are partnering with community leaders to educate and empower individuals to effect change.

Beyond teaching students and communities about climate change, higher education institutions have made great progress in their own impacts on the environment. Just over 10 years ago, over a thousand universities pledged to reach "net zero" by the year 2050. We have seen hundreds of institutions exceed that goal by already achieving carbon neutrality, largely due to cross-institutional collaboration, new methods for reducing digital carbon footprints, and massive decreases in on-site operations. By consolidating and eliminating underutilized buildings, institutions have managed to decrease their carbon emissions. However, they have also consolidated and eliminated corresponding jobs on their campuses. Further, they've offset part of their carbon footprint onto individual contributors who are working and learning from home. Job cuts and lack of green solutions for those operating remotely have heightened the criticism many institutions have faced over their climate policies. Are institutions making substantive contributions to the fight against climate change? Or are these efforts too little, too late, and at too great a cost?

COLLAPSE

Higher education institutions are closing as society moves into the AI-powered metaverse, all but eliminating the demand for formal higher education.

As the impacts of the COVID-19 pandemic reverberated through the early 2020s, supporting students' holistic well-being became one of the most urgent needs in higher education. Faculty and staff knew that supporting students' sense of belonging and connectedness had to be one of their top priorities, but they struggled to find the resources they needed. Funding cuts were already making daily operations difficult, and every day faculty and staff were being asked to do more with less. As faculty and staff were already looking for ways to streamline and downsize daily operations, advances in technology offered new supports for the higher education workforce. Artificial intelligence (AI) tools for learning and work were improving in many ways, making them attractive alternatives to time-intensive work processes. Low- and no-code technologies made it possible for anyone to leverage AI to create, edit, and disseminate information. From email responders to personal tutors, AI tools proliferated across higher education institutions and in personal lives.

Though early AI tools were unable to provide convincing alternatives to human emotions such as empathy and kindness, the massive adoption of those tools enabled substantial data collection for training and improvement. By the late 2020s, AI tools were inexpensive and convincing alternatives to humans for many higher education jobs. Faculty and staff numbers were dwindling, making it even harder for the remaining workforce to find the time to connect with their students. Institutions were losing students due to this lack of attention to personal well-being, and the 2025 Enrollment Cliff only made the problem worse.

To mitigate the damage being done by the lack of resources available, faculty and staff began using AI tools and virtual reality to unite students. These well-intentioned initiatives were indeed attractive to students, who were suddenly able to engage "face to face" with people and "human doubles" from all over the world and metaverse. Encouraged by early success, institutions diverted money from other hybrid learning technologies and doubled down on AI-powered virtual worlds. Now, in 2033, we are seeing how the unintended consequences of these virtual worlds are not uniting students with faculty and staff but are indeed driving them apart. AI worlds that are tailored to each student's unique needs and desires are comforting in comparison to the harsh realities of global climate change, political unrest, and scarce resources. Students no longer care to invest time in formal higher education, and they are fully embracing "meta-living," which includes cultivating relationships with human doubles, creating customized home landscapes, and developing revenue streams from virtual activities—all in the AI-powered metaverse.

Higher education is now facing a true enrollment crisis, and the rate of college and university closures has recently accelerated. Even worse, meta-living has widened the digital divide and exacerbated the equity issues society faced back in the early 2020s. Our society did not have time to adequately address the biases that AI amplified, as algorithms consumed training data without constraints. The more privileged a community was, the more access it had to AI, and therefore most of today's AI tools are trained primarily on data from individuals who are not part of minoritized communities.

Special-interest groups have taken up the call to refocus our society on humanity and equity. Some fear that we have gone too far, that our world can only become more divided. Others are holding out hope that we can find each other again in "the real world," that we can learn from our mistakes, and that we can create a better reality in the future.

TRANSFORMATION

Higher education institutions have streamlined daily operations with artificial intelligence (AI) tools, and stakeholders are now free to focus their ingenuity and creativity on uniting a divided world.

One of the hallmarks of the mid-2020s was the escalation of political divisiveness and conflict. Intensified nationalism and commitment to party ideologies created a hostile social environment and stalled political progress and action. Social and political unrest weren't the only issues that challenged institutions. There were grave concerns related to economic instability, and interest in formal higher education receded as families focused financial efforts on meeting their basic needs. Higher education institutions found themselves caught between opposing groups and struggled to maintain space for collaboration and progress.

For a time, administrators and other institutional leaders only had the resources to react as society became increasingly divided. Funding was insufficient for higher education to maintain status quo operations, but faculty and staff were asked to do more every day—more flexibility for students, more expertise in emerging technology, and more support for students struggling to feel connected to their communities. The first few years following the start of the COVID-19 pandemic were indeed fraught with new challenges and roadblocks.

But in the past few years, technological advancements have catalyzed a reimagining of higher education's role in the broader sociopolitical landscape. Faculty and staff have been able to implement novel AI tools for content creation, editing, and dissemination. Low- and no-code technologies enable anyone in higher education, no matter their level of expertise, to take advantage of tools that create digital content. Now, any instructor is able to generate custom content for their courses with the click of a mouse or the tap of a finger. Educational technology companies now find that their primary competitors are their own customers, and this competition is slowly stalling the ed tech boom of the 2020s.

Now that faculty and staff have reduced the more mundane elements of their workloads, they are focusing on bigger questions that require human creativity and collaboration. Faculty and staff now spend a significant portion of their time engaging directly with students, connecting one-on-one and fostering community and belonging. They work with their local and international communities to unite individuals with wildly different political beliefs. Abandoning the goal of remaining neutral on social and political issues, higher education leaders are creating cultures and policies built on curiosity and collaboration. We aren't there just yet, but we hope to someday find that higher education institutions foster communication through differences, linking all of us in our common humanity.

IMPLICATIONS: WHAT DO WE DO NOW?

Having painted in very broad strokes several abstract portraits of what the future of higher education teaching and learning might look like, we turn our attention now to considering what this year's trends and technologies and practices might mean within certain types of institutional contexts. In 2023, we took an approach that differs slightly from that of past years. For this year's report, we invited seven panelists to write essays reflecting on the implications of the trends and the key technologies and practices from a particular frame of reference.

Each of these panelists was asked to consider the results of the 2023 panel's work through their own unique lens and offer reflections on the following questions: What should we do now? What plans should we make? The panelists approached these questions with their specific institution and functional contexts in mind, offering a view into the latest trends and current challenges and opportunities for higher education as observed from their particular vantage point.

Tracey Birdwell, in her essay about **learning spaces**, describes the transformative possibilities associated with rethinking course delivery models—as long as stakeholder engagement and design considerations for learning environments are both mindfully considered. Similarly, Johann Zimmern notes the importance of intentional technology selection and learning design to ensure **equity in access and accessibility** of high-quality learning experiences. Rayan Rutledge explores the ways in which **digital connectivity** supports diverse aspects of the student experience by serving as the backbone for most of the ways students interact academically, socially, and administratively with their institutions. Writing about **serving adult learners**, Anna Porcaro cites flexibility and convenience, along with greater access to lifelong and workplace learning, as watershed opportunities, providing more equitable access to educational options than ever before.

Jean Mandernach offers a philosophical viewpoint in her thoughts about **innovation in research and teaching**, noting that the rise of technologies like artificial intelligence and the blurred boundaries in learning modalities creates an impetus for educators to pause and reconceptualize the fundamental meaning of teaching and learning. Danny Liu agrees on the importance of taking a pause, particularly for **faculty** to reinvigorate after years of constant adaptation and accelerating change, finding a renewed focus on well-being that reignites passion and allows faculty to rediscover the joy and humanity in teaching.

Ayla Moore reflects on the values and needs of students coming from nondominant cultures and on the role of **instructional designers at under-resourced institutions**, who can help develop microcredentials with stackable pathways that hold real applied value for students while supporting faculty and other institutional stakeholders in designing high-quality, flexible learning options.

Whatever your institutional setting, the essays provided by these seven panelists will likely ring true in many ways because they emerge from our shared experiences, even as they take root in specific contexts. They remind us that challenges and opportunities are not ours alone and that there is a larger community of institutions and practitioners out there with whom we can find common ground and with whom we can share and learn.

Learning Spaces

Equity and Accessibility

Digital Connectivity

Adult Learners

Innovation in Research and Teaching

Faculty

Under-Resourced Institutions

LEARNING SPACES

Tracey Birdwell, Program Director, Mosaic Initiative, Indiana University Bloomington

Since the start of the pandemic, higher education has embraced multimodality. In this new teaching and learning landscape, the HyFlex model, which has been around for almost 20 years, has enjoyed renewed attention as a desirable course delivery approach. This shift in attitude about where and when students learn, and specifically about HyFlex's multimodality, has significant implications for future learning spaces. For learning spaces teams, considering how to design classrooms and informal spaces for HyFlex learning will be critical for its successful implementation. Learning spaces teams will also need to strategically partner across their home institutions to ensure systematic approaches to reconceiving the physical and digital ecosystems of learning.

This shift in attitude about where and when students learn, and specifically about HyFlex's multimodality, has significant implications for future learning spaces.

Multimodality is not new to higher education, but the switch to online learning in spring 2020 and the hybrid solutions that dominated institutions the next fall created ideal conditions for reconsidering HyFlex as a delivery model. The pandemic pivot to emergency teaching required instructors and students to cobble together a variety of approaches. Faculty who had only taught face-to-face quickly had to shift to online instruction. Many instructors would eventually teach both in-person and remote students. This sudden about-face from in-person-only instruction turned faculty across higher education into multimodal teachers (and gave their students the same introduction). All of these changes meant that many more stakeholders experienced HyFlex teaching, which could translate into accepting and adopting HyFlex after the pandemic had passed.

To accommodate the pandemic classroom, learning spaces teams moved quickly to transform campus audiovisual offerings. More mics and cameras enabled rooms to reach remote students, and instructors became familiar with how to navigate and teach with the technologies. At many institutions, this change has evolved into normal practice.

Student choice, Universal Design, and flexibility are key pillars of HyFlex's promise. But less mentioned in the HyFlex conversation are questions about how we design the infrastructure and assemble the stakeholders required to build and support the environment in which we can successfully implement courses designed for HyFlex, with equal success for any modality a student chooses. Implementing HyFlex and, more specifically, thinking about how to design and build the most successful learning environment for HyFlex, is task learning spaces teams can contribute to the most.

Whether HyFlex grows significantly in higher education remains to be seen, but learning spaces teams should consider four things as they implement HyFlex in this changed landscape:

- **Establish the need.** Figuring out a plan for your institution is critical. Early in the process, determine the number classroom spaces your institution needs to support HyFlex. Ideally, establish the current practices and future needs, partnering with your registrar and other stakeholders. Ask the following questions:
  - How many courses are currently delivered in a HyFlex model?
  - How many courses are projected to be taught in a HyFlex model?
  - Which disciplines are most suitable for HyFlex courses?
  - What are the enrollments of the courses using HyFlex?
  - How many in-person seats does each course require?

  Working with others will reveal the need, desire, and potential for HyFlex at your institution. HyFlex spaces might become the new standard; alternatively, only a few classrooms might be set aside for the HyFlex model.

- **Assemble the team.** HyFlex requires stakeholders to work together to design and support well-functioning, truly hybrid, truly flexible learning environments. A key to success will be to assemble a task force or working group to support early pilots, identify ideal rooms, and evaluate early efforts. HyFlex will require a comprehensive approach, bringing in representatives from many groups such as learning spaces, online learning, student support, teaching and learning centers, and the registrar's office. Another option is to encourage learning spaces and teaching centers to collaborate to introduce, train, and design instruction for the classrooms. Thus, HyFlex invites us to see how learning environments, online learning, and instructional design are intertwined.
- **Set the standard.** In collaboration with stakeholders, learning spaces teams will need to determine what the HyFlex model standard will be. This will require more than rethinking audiovisual standards, new focal points, new instructor stations, software upgrades, and seating arrangements. Rather, HyFlex will require learning spaces teams to consider how their designs support equitable environments; how to connect physical and digital infrastructure on campus and off; and how to support students who are learning in different environments both synchronously and asynchronously. Teams will need to address new challenges and implement comprehensive standards for their campus.
- **Support the space.** Supporting HyFlex learning spaces will require stakeholders to continue collaborating even after those spaces are built. Instructors will need assistance designing and teaching in HyFlex scenarios. Students will need help navigating learning choices. Classrooms may need recalibrating in response to classroom needs. Learning spaces teams can support and lead HyFlex efforts at their institution by communicating ways to teach and learn in the physical space, keeping track of data related to how the spaces are used (and sharing their findings), and receiving feedback about how instructors and students are experiencing the space.

The pandemic forced higher education to expand options for course delivery models. For learning spaces teams, the new normal meant quickly designing and supporting spaces to meet the increased demand for physical classrooms that support many modalities. Moving forward, we have a chance to evolve our classrooms with more intention. Early in the process, learning spaces teams will need to decide whether they want to adopt universal standards for *all* learning spaces, ensuring that any classroom can be used for HyFlex, or design classrooms for specific modalities.

Such transformation creates opportunities for partnership and leadership. For learning spaces teams, redesigning increasingly connected physical and digital ecosystems for learning means working with numerous partners, perhaps more closely than before and for many stages of design and support for classrooms. Importantly, these connections mean that learning spaces teams might take more opportunities to advocate for best practices for active learning, accessibility, and flexible tools for physical classrooms. Considering HyFlex could be an opportunity to rethink all of our learning spaces to support student choice. Learning spaces teams can lead the charge to design more inclusive, connected, and functional classrooms.

Author Bio

Tracey Birdwell, Ph.D., serves as the Program Director of the Mosaic Initiative (mosaic.iu.edu) at Indiana University. She leads a university-wide initiative to support active learning, research, and innovative design in all IU classrooms. Birdwell has published her work in *EDUCAUSE Quarterly*, *EDUCAUSE Review*, *Innovative Higher Education*, *The Journal of Learning Spaces*, *Campus Technology*, *The Journal on Centers for Teaching and Learning*, *Issues and Trends in Learning Technologies*, *Online Learning*, and *The Conversation*. She earned her Ph.D. in American History from the University of Delaware.

EQUITY AND ACCESSIBILITY

Johann Zimmern, Global Education Strategy Lead, Zoom

Equity and accessibility in higher education are critical issues that have become even more pressing as we continue to embrace hybrid and online learning. Additionally, many institutions are transforming their campus infrastructure to support hybrid work environments and preferences for remote work.

Creating a welcoming and inclusive learning environment is central to the idea of equity and access in education.

While students, administrators, and educators have seen many positive effects from this shift, we are still grappling with challenges that could pose even greater barriers to equitable and inclusive teaching and learning. Not all students have access to reliable internet, devices, or other necessary technology to participate in learning. This disproportionately affects low-income students, students of color, and students in underserved urban and many rural areas.

We also know that online learning can be isolating for students, especially first-generation college students, students with disabilities, and nontraditional students. Some students do not have support systems in place or might struggle to navigate online learning environments.

Despite these challenges, online learning has helped increase flexibility and access to educational opportunities. Here are some of the implications of this shift and recommendations for how more online, hybrid, and HyFlex learning modalities can help institutions meet all students' needs.

Accessibility and Inclusivity

Online opportunities are helping democratize education and narrow the privilege gap by addressing barriers related to affordability and distance. Online classes often have lower tuition than in-person classes, and online students can save money on transportation, housing, and other expenses associated with attending a physical campus. For students who don't live near their preferred institution and aren't able to relocate closer to it, online learning opens up a wider range of educational opportunities. Students now have access to classes from top-ranked institutions and renowned educators, access many students would not have had otherwise.

Creating a welcoming and inclusive learning environment is central to the idea of equity and access in education. Students with physical disabilities may choose to attend classes online, as well as events such as orientation or instructors' office hours. Students who are deaf or hard of hearing or who are taking classes in a language that isn't their primary language may require interpretation services or learn better with captions and recorded material.

These opportunities extend beyond the classroom, enabling all students and staff to participate in work and learning through advances in communication and collaboration technology. Mike Logan, dean of IT at Western Iowa Tech Community College, shared how his institution used unified communications to enable greater accessibility for a help desk employee who is deaf. When a person calls the help desk, the employee can review the voicemail transcription, then provide support via chat.

"Her phone is set up to go immediately to voicemail so she gets the transcript by email. Then, she goes to team chat to send a message to the student. She can also send an SMS text," Logan said. "She can interact with the customer in a way she's never been able to before—and that's pretty amazing."

It's these types of enablements that improve user experiences and create a more equitable environment in our work lives.

Hardware and software vendors have taken a more prominent role in raising awareness for accessibility in general. Visual impairments or auditory disabilities create unique challenges for many. Within online learning environments, closed captioning, live transcription, recorded and transcribed sessions, support for sign language interpreters, screen readers, and video relay services are just a few of the technology enhancements that help users collaborate with one another.

Final Thoughts

Ensuring that all students have equal access to high-quality education is crucial for promoting social mobility, creating a just society, and providing opportunities for everyone. Equity and accessibility in higher education are critical issues that must be addressed.

One of the first steps toward that goal is designing classrooms that support different ways of learning. If institutions choose to offer hybrid and HyFlex learning environments, instructors must take care to provide equitable learning experiences for all students, whether they are remote or in person. Remote students cannot be treated as an afterthought, and in-person experiences should not be viewed as superior. Equal opportunities should be given for students to engage with their instructor, the course material, and each other, no matter where they are.

Choosing the right hardware can help with that. Cameras with auto-framing capabilities give students attending virtually a better view of instructors as they move around the room. Microphone arrays allow students in class to be heard by those at home, and multiple monitor setups with virtual gallery views let all students see and be seen.

While many students embrace a more connected educational experience, others may have difficulty navigating the technology or may not thrive with online or hybrid modalities. Institutions can provide these students with support such as tutoring services, academic advising, and mental health resources, in person or virtually. Institutions must also continuously evaluate their technology platforms to ensure they meet accessibility standards for all students and equip instructors with the tools and resources to successfully engage with students in remote and in-person environments.

As institutions navigate the continuing challenges of in-person, hybrid, and online learning, it is essential that they prioritize equity and accessibility so all students can succeed.

Author Bio

Johann Zimmern is Zoom's global education strategy lead, with responsibility for its school and university customers. In this capacity, he's driving go-to-market strategy and is spearheading important academic-related programs, marketing, business development activities, and partnerships.

DIGITAL CONNECTIVITY

Rayan Rutledge, Principal Architect, AT&T

Institutions of higher education in the United States have been a destination for students since the 1600s. Times have changed, and so have students and their educational needs and expectations. Today's students have many options to advance their knowledge and skills besides attending college. They have easy access to an enormous variety of free online resources and courses. There are also more opportunities to enter the job market without a four-year degree. Given all these options, why do students still pursue college, and what's the impact of digital connectivity on the fabric of campus community?

> Connectivity is the backbone that powers campus networking tools, mobile applications, and alert systems.

The biggest advantage for students are the doors that college opens to increased opportunity. It's not just about getting a degree and gaining access to jobs with more earning potential. College is also a gateway to endless possibilities of making new connections that enrich student's lives and expand knowledge sharing and learning. A core human need is social connection, and a foundational piece of college has always been the student experience and the opportunity to be part of a community. The sense of belonging is essential for a student's social development and ability to learn and succeed.

Students expect access and connectivity to the people, services, and applications they want, when they need it. This always-connected approach can be beneficial in building relationships and helping students feel valued and secure. But in some cases, it can also create challenges for student health, magnifying feelings of loneliness and isolation. Digital connectivity is the key enabler for mainstreaming new learning, health, and well-being applications.

The Value of Digital Connectivity

Colleges and universities face many challenges, from tightening budgets to student recruitment and retention. Higher education also faces competition from other entities that are rapidly transforming their infrastructures to meet the needs of students and faculty. Many institutions are struggling to implement new technology and curriculum while ensuring that student connections, faculty research and interactions, and campus life and traditions are not lost or diluted. This is especially true for commuter campuses that face many challenges in building community among students and faculty. As institutions work to meet their infrastructure and networking needs, leadership should leverage connectivity to emphasize their unique experience. The goal is simple: create the best student experience for every student.

Connectivity for a Great Experience

Most institutions' legacy network infrastructures are not meeting the needs of today's diverse student population. In addition to understanding digital equity challenges, institutions should audit their existing infrastructure to determine connectivity weaknesses and risks. This information should be used to develop a "campus connectivity roadmap" that forecasts key elements like coverage needs, risks, projected network bandwidth, and application requirements. Institutions are recognizing that traditional fixed connections and Wi-Fi will not meet all the performance demands of students, faculty, and campus support staff. To help augment and extend network connectivity on campus, more institutions are exploring hybrid networking options.

As the fifth generation of cellular networking, 5G is more reliable and efficient than previous networks and can handle more connections at faster speeds. Institutions are using 5G as an extension of their IP networks to create wider access and more dependable coverage on campus and, in some cases, to adjacent communities. Institutions are also installing cutting-edge, on-premises 5G networks to support research of advanced enterprise use cases. The University of Tennessee Knoxville recently launched a 5G testbed using an ultra-high-frequency millimeter wave network that is being used to research innovative technologies like autonomous vehicles, precision agriculture, and telemedicine. In addition to creating a real-world learning environment for students, the lab is also attracting enterprise partners interested in testing new technologies.

Increased, Reliable Connectivity

One of the most important aspects of 5G is that its faster speeds, lower latency, and dramatically higher capacity can power more Internet of Things (IoT) connections and data between applications, sensors, and devices on campus. Colleges and universities can improve the student experience by automating student support services, monitoring student performance, and improving safety in dorms. In the classroom, institutions are leaning into IoT by adopting interactive whiteboards and touchscreens to create dynamic learning environments.

Outdated campus security phones and wired video surveillance systems are being replaced with smarter campus security systems using 5G connectivity. 5G-enabled next-generation video surveillance technology is more reliable and can provide better data to campus police. 5G is also paving the way for institutions to explore how artificial intelligence (AI), combined with biometric sensors and facial recognition technology, will make tomorrow's campus safer and easier to secure. Augmented/virtual reality is a powerful teaching and training tool for extending the learning experience beyond campus borders, which is ideal for hybrid learning environments across disciplines, where students can be immersed in real-world experiences, from performing delicate medical procedures to training mechanics to identify and replace defective parts.

Connectivity as a Bridge to Community and Campus Life

Connectivity is the backbone that powers campus networking tools, mobile applications, and alert systems, which are essential for communicating information regarding events, calendars, and other campus activities to students, faculty, and staff. Social engagement platforms can help create a sense of belonging for all students, which is vital for retention and the health and well-being of students seeking social interaction. Virtual destinations give students, faculty, and alumni a place to come together to share ideas, learn, and nurture friendships. Gamification can be an effective lever in connecting students virtually with campus experiences, events, and activities.

Closing

As institutions invest in next-generation, smart-campus capabilities using 5G, IoT, and other emerging technologies, the campuses that build their infrastructures with a focus on delivering the best college experience possible for *all* students will have a competitive advantage. These institutions will be best positioned to attract and retain well-rounded, top-performing students. The "smartest" campuses will excel at offering the best combination of personalized learning and digital social engagement solutions in a way that connects and inspires the next generation of learners and educators.

Author Bio

Rayan Rutledge is a member of AT&T's Advanced, Complex and Emerging wireless team supporting higher education, K–12, and state and local government. As a Director of Strategy and Innovation, Rutledge has a keen focus on the latest wireless technologies, applications, and research projects impacting higher education. Rutledge has 20+ years selling, consulting, and supporting innovative technology solutions for higher education.

ADULT LEARNERS

Anna Porcaro, Executive Director of Online and Adult Learning, Wichita State University

Because of the demands from jobs, families, and personal lives, adult learners have long needed flexible learning options. Online learning provides access to quality educational experiences when and where adults need them. Since the onset of the COVID-19 pandemic, higher education has seen a drastic rise in the number of students learning online, both in credit-bearing courses (IPEDS Fast Facts: Distance Learning) and non-credit professional development (Coursera impact report). Although those numbers are dropping, they are still higher than pre-COVID levels; this is not a temporary change.

By providing more options for lifelong and/or workplace learning, colleges and universities not only stay relevant in the 21st century but also support adult learners.

Furthermore, the aftermath of COVID-19 and the "great resignation" have created long-term changes in workforce practices. Employees and employers alike noticed skill gaps that have not been filled through established degrees or work experience. In response, institutions have begun to present more options for lifelong or workplace learning. While these trends benefit all students, adult learners are more equitably served than before.

Flexible and Convenient Learning Modalities

Two of the biggest struggles for adult learners are the demands on their time and difficulty getting to campus. While not all adult learners are online students, their commonality is that because of jobs, family, or community ties they cannot uproot their lives or put them on pause. Greater access to flexible educational opportunities benefits them immensely.

For those who doubt the benefits of flexible learning options, recent studies show that there can be a demonstrably significant difference in the effectiveness of hybrid learning over other forms of learning:

- "Investigation of the Effectiveness of Hybrid Learning on Academic Achievement: A Meta-Analysis Study"
- "Blended Learning vs. Traditional Teaching: The Potential of a Novel Teaching Strategy in Nursing Education—A Systematic Review and Meta-Analysis"

Despite the benefits, higher education has been slow to adapt. This is because such adaptation requires changes to cultures, infrastructures, and resource allocations and demands higher levels of support, all of which are major disruptions to the "way things are done."

In the near future colleges and universities will be able to develop a competitive advantage by offering deliberately designed, flexible, effective, high-quality learning options that are student focused and that ensure parity regardless of modality.

Lifelong and Workplace Learning

By providing more options for lifelong and/or workplace learning, colleges and universities not only stay relevant in the 21st century but also support adult learners. Adult learners often fall into the categories of career climbers, career changers, or degree completers. Lifetime learning and workforce readiness benefit all those subsets of adult learners, and adults indicate that they are willing and able to learn new skills.

Career climbers need new skills and specialized education to progress in their careers. Employers use professional development as an incentive for employees to stay at their current employer. One example is a seasoned factory worker who wants to become a project manager or leader. To meet this need, higher education can provide leadership and/or project management training through microcredential options. This, in turn, may help such workers demonstrate that they qualify for promotions or increased responsibilities.

Workforce training can enable adults to pursue a new career path in a chosen discipline. An example could be a licensed dental hygienist who has an associate's degree but wants to engage in community health instead of private practice and therefore needs more comprehensive training. To get this training, this person can choose courses, workshops, certificates, or even a degree-completion program, all of which take less time than pursuing a fully new degree.

For all three types of adult learners, lifelong learning can edify and enrich their lives. This is learning that our COVID-19 experience has prepared us for—we are now much more culturally adept at learning through video instruction after learning to garden, bake, or tackle home repair projects, thanks to video tutorials from online experts.

Institutions that want to start or expand lifelong and workforce learning programs need to take into consideration the costs to the students. Many institutions have certificates, but enrollments are low because they are not affordable and most are not eligible for federal financial aid. At the same time, the most successful programs for workforce learning are those that start with the workforce needs and then build learning to match.

Conclusion

The trends of flexible and lifelong/workforce learning options provide adult learners more educational options than ever before. As we move deeper into the 21st century, to remain relevant higher education must be flexible and approach education holistically.

In the same way that the principles of universal design help everyone, not just people with disabilities, colleges and universities providing flexible and lifelong/workforce learning lead the way in supporting all learners. Historically these two practices were designed specifically for adult learners. The COVID-19 aftermath presents an opportunity to apply flexible methods to all of higher education. This will generate impactful learning environments for all students, in all walks of life.

Author Bio

Dr. Anna F. Porcaro is the Executive Director of Online and Adult Learning at Wichita State University. She previously worked in digital transformation at the University of North Carolina, Muskegon Community College, and the University of Dayton. She has written for *WCET Frontiers* and *Education Technology Insights* and presented at meetings and webinars run by Anthology (Blackboard), the State Authorization Network, UPCEA, and WCET. In addition to serving as an Expert Panelist for the 2023 EDUCAUSE *Horizon Report*, she is an active HLC Peer Reviewer. She earned a Ph.D. in Musicology from UNC and plays the guitar and lute.

INNOVATION IN RESEARCH AND TEACHING

Jean Mandernach, Executive Director, Center for Innovation in Research and Teaching, Grand Canyon University

The disruptions to teaching and learning spurred by the pandemic have spawned an existential crisis (of sorts) for higher education. Rather than simply returning to an earlier normal, higher education is seeking a "new normal," one that intentionally meets the needs of today's college students. Though this reckoning is driven by converging technological advances and social trends, it is less about technology than about redefining education and embracing the changes necessary to impact student learning, instruction, and pedagogical research in meaningful ways.

> Leaders in teaching and research must identify innovation barriers and modify practices, policies, or processes to support change.

Two key developments are central to this shift: the rise of artificial intelligence (AI) in education, and the blurring of boundaries between campus-based and online learning modalities. As technology has evolved, it has enhanced access to information, enabled flexible interaction, and increased the ability to tailor educational experiences to individual students. While each of these changes has the potential to impact educational experiences, as a collective they provide the impetus for foundational shifts in teaching and learning.

Innovation in teaching and learning has historically rested in the emergence of new instructional technologies or pedagogical practices, but the post-pandemic era is forcing educators to reevaluate and reconceptualize the fundamental meaning of teaching and learning. No longer is it sufficient to view teaching and learning as the dissemination and regurgitation of content. Students live in a world in which technology intimately connects them to content, divergent ideas, and people. Before promoting the integration of AI into the learning experience or enacting fundamental changes to instructional format, campus leaders need to spearhead conversations that focus on two fundamental questions: what does it mean to teach, and what does it mean to learn?

Without earnestly considering these questions, we risk investing extensive time and resources in initiatives that fail to address student needs. Without a nuanced understanding of the role and purpose of teaching, we risk simply shifting the task of providing content to an automated format, which fails to address the fact that our students don't need more content—they are overloaded with content, part of a complex network that allows them to find and produce information at the touch of a button.

This awareness shifts the focus of teaching to the roles of inspiration, guidance, and feedback. Students need to have their natural curiosity piqued by a content expert who can see complex applications and understand subtle gradations. They need guidance on how to navigate content, ask questions, consider contextual factors, and apply knowledge in meaningful ways. They need to engage with content and receive feedback that shapes their understanding in ways that build a meaningful cognitive schema. Learning must extend beyond demonstrating content knowledge on an exam or a term paper. Learning and the demonstration of learning must include students as active collaborators. Assessments and activities need to offer students agency in the learning process and foster opportunities to build relationships with others around the content.

Advances in the adaptive capability of AI, in conjunction with increasing pressure/desire to meet the needs of individual students, are shifting the focus from one-to-many instructional and assessment strategies to tailored, individualized educational experiences. Higher education has historically approached teaching (both research on and the practice of) as a collective—given the practical limitations associated with one teacher and many students, pedagogical practices were designed and evaluated in relation to their impact on classes of students, rather than to the differential needs of each student. But the rapid evolution of AI is changing our ability to adapt instruction and assessment to the needs, strengths, goals, and preferences of individual students. This technological advance is occurring at the same time faculty are facing increased expectations to enhance individualized student support and to tailor learning experiences and outcomes to align with students' professional goals. It is essential that we shift pedagogical research and practice to examine adaptive instructional strategies and assessments (AI-driven predictive, personalized learning), just-in-time student support, student agency in assessment, and competency and skill identification that allows alignment with workforce needs.

To continue advances in teaching and learning, higher education leaders must challenge the processes and infrastructure that inhibit instructional innovation. Higher education is at the cusp of fundamental, foundational change. Students are demanding more equitable, inclusive teaching. Faculty are embracing new pedagogies and technologies to foster effective learning. Employers are pushing for comprehensive learner records of skill-based learning and achievements. Technology is offering new ways to deliver content and assess learning. Simply put, pandemic-induced disruptions have challenged the status quo and have prompted us to rethink and reevaluate virtually every aspect of the learning experience. But for us to tap into the potential, we need to examine the underlying infrastructure and processes that may impede innovation.

Leaders in teaching and research must identify innovation barriers and modify practices, policies, or processes to support change. For example, there is a clear need to embrace flexible approaches to teaching and learning that integrate hybrid, blended, HyFlex, campus, online synchronous, or online asynchronous modalities, yet many campuses lack the necessary infrastructure in scheduling and communication to effectively accommodate nontraditional course formats. Moreover, despite a push for shifting instructional expectations to embrace engagement, interaction, and applied learning, many faculty evaluation models still rest on criteria that prioritize didactic teaching strategies. Equally relevant, budget constraints may impede innovation by funding technology but failing to prioritize the necessary support staff to assist faculty in effectively embracing cutting-edge practices. Something as fundamental as a mandate to provide course grades can limit innovative approaches to assessment and ungrading that emphasize competency-based learning over time-based course completion. Institutions need to be willing to explore potential barriers that may inhibit transformative change.

Underlying these implications is the need for educational leaders to pause. Before integrating emerging technologies or adapting instruction, leaders in teaching and research must examine the fundamental assumptions that drive current approaches to higher education, explore the paradigm shifts necessary to make innovation meaningful, and address institutional structures that hinder innovation.

Author Bio

B. Jean Mandernach, Ph.D., is Executive Director of the Center for Innovation in Research on Teaching at Grand Canyon University. Her research focuses on enhancing student learning experiences in the online classroom through innovative instructional and assessment strategies. She explores strategies for integrating efficient online instruction in a manner that maximizes student learning, satisfaction, and engagement. In addition, she has interests in innovative faculty development and evaluation models, teaching and learning analytics, emergent instructional technology, and faculty workload considerations. Mandernach is an active researcher, author, presenter, and consultant in the field of online education.

FACULTY

Danny Liu, Associate Professor, University of Sydney

We often see institutions as composed of departments, faculties, and administration, but to a student, the faculty often *are* "the institution"—their instructors are the human pedagogical and pastoral face of the monolith. After all, faculty design students' learning and assessment activities and walk alongside them in their learning. Indeed, the quality of teaching and of faculty–student relationships are well-known factors for student success. However, the seemingly incessant and accelerating changes besetting higher education, ultimately borne by faculty who need to constantly adapt and adjust in order to best serve their students, have significant impacts on their own well-being and connection to things they hold dear: students and the sharing of their discipline.

> Many faculty are mentally and emotionally revitalized from sharing a classroom space with students, teaching and learning alongside them.

Becoming Makers Instead of Victims of the Future

Faced with this journey toward a horizon that shifts and seems further away each year, many faculty struggle to keep up, and not for a lack of trying, especially after the past three years of teaching in a pandemic. Each new semester brings a new crisis, and faculty have little choice but to adapt, upskill, and pivot. We feel like "victims of the future" instead of having the autonomy to control it.

The accelerating pace of change is highlighted in some of the trends, technologies, and practices of this year's teaching and learning *Horizon Report*, in terms of how teaching occurs and the shifts in the higher education context. "Increased demand from students for flexible and convenient learning modalities" and "blurring the boundaries between learning modalities" put pressure on our feeling of competence and require significant upskilling. The "growing potential for AI to become mainstream," "AI-enabled applications for learning and content creation," and the "increased demand for lifelong, workplace learning" compel us to reexamine assessment and curriculum.

Driven by commentary in social and mainstream media signaling threats to higher education and assessment, faculty may also be struggling with a status drop.

Faculty are not resistant to change and innovation. Far from it. Our research often drives societal and other advances. However, how do we advocate for our institutions to appropriately support and reward change and not punish innovation in teaching? Which evaluation and recognition structures are outdated or biased or even make faculty fearful to experiment? Solving these wicked problems will provide us with the autonomy to become "makers of the future" and experiment boldly with evidence-based practices to bolster feelings of competence.

A Renewed Focus on Well-Being

But how can people who are beyond the breaking point continue to draw out the passion and care to front up to class and connect with students, let alone make changes? "Unsustainable" and "burnt out" are increasingly whispered among colleagues as the goalposts seem to keep moving further, pushed by a hegemonic system seemingly focused on financial expansion at any cost.

Exacerbated by the pandemic, everyone faces significant allostatic load caused by trends and related pressures internally and externally, impacting morale and engagement. Stressors internal to institutions include "universities expected to do more with less," an "intensifying need for equitable and inclusive teaching," and teaching in new modalities (such as HyFlex). Of course, many of these are very worthwhile. Stressors external to institutions include environmental (climate change), geopolitical (disinformation, nationalism, and political party conflict), and social (affordability) challenges that weigh on our minds globally but also impact locally.

A silver lining to this predicament is that there seems to be a renewed focus on mental health and well-being. Colleagues are bolder at setting boundaries, and professional learning initiatives have refocused on building collegial environments for debriefing, sharing, and learning together. We need to advocate for institutional change toward valuing flexibility, supporting collegial communities, and realistic resourcing, leveraging the re-realization that enrollments and student experience have positive impacts on the bottom line. Individually, we can also be more open with colleagues and even students about well-being challenges as a way to normalize the collective struggle toward a collective solution.

Rediscovering the Joy and Humanity of Teaching

Many faculty are mentally and emotionally revitalized from sharing a classroom space with students, teaching and learning alongside them. This has been eroded over the past three years, with blank screens and empty chat boxes starving us of this rejuvenation. Not only that, but our valiant efforts felt ineffectual against the tide of rising disconnection and its related drop in student performance. Learning is a highly relational activity, and rebuilding these connections is critical to faculty and student motivation.

The key practice of "supporting students' sense of belonging and connectedness" therefore goes both ways. Deeper than belonging, the idea of mattering is crucial—the feeling that you are significant to and valued by others. During pandemic teaching, we recognized the humanity of opening ourselves up to students and being a little vulnerable. Continuing in a spirit of openness, we can show humility and invite students to co-design learning and assessment, thereby further fostering the multifunctional teams of designers and faculty who made pandemic teaching possible. Trusted colleagues invited to observe our teaching can provide valuable perspectives and affirmation. Much more than the next shiny technology, fostering mattering and connectedness in these ways will build environments where students can experience how much we care.

Summary

Our reconnection with each other hangs on upholding and protecting faculty well-being. The aspects of autonomy, competence, and relatedness covered above will drive faculty motivation, which will then drive student outcomes in the face of accelerating change. Importantly, institutions need to be brave and must support, reward, and recognize those aspects of teaching that actually count, such as building environments where students matter, that are personalized, and that are relational.

Author Bio

Danny Liu is a molecular biologist by training, programmer by night, researcher and faculty developer by day, and educator at heart. A multiple international and national teaching award winner, he works at the confluence of learning analytics, student engagement, educational technology, and professional development and leadership to enhance the student experience. He is an Associate Professor in the Deputy Vice-Chancellor (Education) Portfolio at the University of Sydney, where he leads faculty and staff across the institution in educational innovation, blended and online teaching, and the effective use of learning analytics and AI to improve student learning and experience.

UNDER-RESOURCED INSTITUTIONS

Ayla Moore, Instructional Designer, Fort Lewis College

As the sole instructional designer (ID) at a rural Native American–Serving Nontribal Institution in the American Southwest with Indigenous students from more than 180 Tribal Nations, I encounter a great abundance of diversity and talents. Despite many students being the first in their families to attend college, the core values of the community in the academy are not entirely unfamiliar: strong place-based identity, ceremonial traditions, staunch defense of community sovereignty and self-governance, skepticism about the motives of external entities, epistemological knowledge systems through storywork and lived experiences, to name a few.

Where the commonalities fall short are in the academic legacy of enrolling only a privileged few for the purpose of educating a "lifelong learner" or a "free thinker." Students from historically nondominant cultures may share these individualistic goals to redefine themselves while also anchoring the purpose of a college degree to benefit their communities of origin. They recognize how a college education can help them uplift others by addressing the effects of climate change, access to healthy food or clean water, educational and economic disparity, mental health, racism, political divisions, violence, and trauma. How can we shift the mission of higher education to amplify community for these future leaders who need access to the academy's rich networks, mentors, and resources? By centering flexible learning in the traditional academic conceptualizations of student motivation and time, instructional designers, especially those who work at smaller or under-resourced institutions, may provide the solution.

Research on motivation for first-year students reifies how their perceptions of task value can prevent their full participation in learning, especially in historically didactic, sometimes esoteric general education courses.

Microcredentials to Impact Motivation

Based on the equity gaps in first-gen and non-first-gen student graduation data, we find compelling evidence to justify microcredentials, a series of smaller stackable professional credentials for a less time-and-cost-restricted approach to a college degree. Research on motivation for first-year students reifies how their perceptions of task value can prevent their full participation in learning, especially in historically didactic, sometimes esoteric general education courses. Redesigning these classes to build toward a microcredential could provide the motivation students need to acknowledge that coursework is relevant to their goals and their future.

In facilitating a faster path to expertise, microcredentials position students to become more agentic in their learning, choosing where and when to invest their time, under the guidance of faculty mentors. Stackable certifications can build toward a traditional four-year college degree for students who are strategically balancing work and family lives with their own academic aspirations. For those who want to upskill for an existing entrepreneurship or take advantage of a local internship, microcredentials can hone their success in areas relevant to their careers. Companies have jumped on this microcredential bandwagon by offering corporate certifications to their employees, but these lack transparency and value as evidence of transferrable skills, civic participation, and knowledge work as social capital.

How can IDs motivate their campuses to recognize the value of microcredentials for students? A common misstep would be to string together a handful of courses and try to tie them together with a microcredential. Instead, IDs will need to extend their partnerships with faculty and academic leaders to consult with professional and regional communities. This shift may also require that IDs conduct needs assessment on student and community interest; recalibrate learning outcomes and credit load; streamline curriculum; design authentic assessments; align with institutional mission and goals, and assess/refine programmatic success to substantiate their microcredentials and differentiate them from existing competition.

Structured Flexible Learning to Manage Time

When learning is tethered to a specific location at a specific time, student access becomes restricted with the onset of mental health issues, failing grades, missing classes, or feelings of isolation. Structured flexible learning approaches such as a HyFlex or LoFlex allay time and mobility constraints for students. Based on a highly flexible model, HyFlex extends opportunities for learning through instructional design that creates online learning assessments, content, and activities equivalent to those occurring in an in-person setting, allowing students the time to access learning in either environment. HyFlex design can be synchronous, with students attending virtually to participate with their instructor and peers in the classroom, or asynchronous, providing opportunities to complete course requirements and connect with peers and their instructor digitally as their schedules dictate.

What do IDs need to build a structured flexible learning ecology? One of the first considerations is assessing faculty culture and willingness to teach in two modalities. Data on student needs and learning preferences are necessary to create a compelling narrative. To support the seamless transition from in-person to remote learning, students will need to have access to reliable broadband connectivity. Classrooms will require updated technology infrastructure. IDs may need training to help faculty leverage courseware design and products to equitize learning in either modality.

If HyFlex seems intimidating or expensive, IDs can opt for a scalable LoFlex design, which can be defined as occasional or intermittent online or remote activities to achieve course learning outcomes while still maintaining a preference for in-person learning. As professionals, many of us work in small offices with limited time and budgets for travel. As part of our continued career development, we engage in structured flexible learning to connect with remote colleagues by attending virtual webinars, watching recorded presentations, or participating via email or LMS in peer communities. Exposing students to these same opportunities, perhaps with a microcredential in the technological literacies for flexible learning, could develop academic and professional skills they may need in the future.

Conclusion

"College Changes Everything," a recent statewide campaign in Illinois, showcases the profound impacts a college degree has, not just on individuals but on their communities as well. Reimagining the purpose of college in solidarity with students and their communities compels IDs to capitalize on our unique vantage point from our work with faculty, DEI offices, Academic Affairs, Student Affairs, IT, administrative leaders, regionwide communities, teaching and learning professionals at other institutions, and vendors in educational technology. We already know that college changes "everything." It's time to discover how changing college could do even more.

Author Bio

Ayla Moore, M.F.A., has worked in higher education since 1996, both as an instructor and as staff at Fort Lewis College. Her current role is with the Center for Teaching & Learning as a Senior Instructional Designer and Faculty Development Specialist.

METHODOLOGY

The *Horizon Report* methodology is grounded in the perspectives and knowledge of an expert panel of practitioners and thought leaders from around the world who represent the higher education, teaching and learning, and technology fields. This year's group included returning and first-time Horizon panelists, all sought out for their unique viewpoints, as well as for their contributions and leadership within their respective domains. The panel represents a balance of global contexts, with members contributing from North America, Europe, Asia, and Australia. We also sought balances in gender, ethnicity, and institutional size and type. Dependent as the *Horizon Report* is on the voices of its panel, every effort was made to ensure those voices were diverse and that each could uniquely enrich the group's work.

Expert panel research followed a modified Delphi process, in addition to adapting important elements from the Institute for the Future (IFTF) foresight methodology. Following the Delphi process, our expert panelists were tasked with responding to and discussing a series of open-ended prompts, as well as participating in subsequent rounds of consensus voting (see sidebar "Panel Questions"), all focused on identifying the trends, technologies, and practices that will be most important for shaping the future of postsecondary teaching and learning. Ideas for important trends, technologies, and practices emerged directly from the expert panelists and were voted on by the panel. EDUCAUSE staff provided group facilitation and technical support but minimal influence on the content of the panel's inputs and discussions. This was done to protect the core intent of the Delphi process—that an organized group of experts themselves discuss and converge on a set of forecasts for the future, on the basis of their own expertise and knowledge.

The framing of the questions and voting across each round of panel input was adapted from IFTF's foresight methodology and drew upon the IFTF trends framework and process for collecting "signals" and "impacts" for trends. Ensuring an expansive view across all the many factors influencing the future of higher education, the IFTF "STEEP" trends framework enabled our panel to focus on Social, Technological, Economic, Environmental, and Political trends. This effectively broadened the panel's input and discussions beyond the walls of higher education to more explicitly call attention to the larger contexts within which teaching and learning takes place. These larger trends—and the current evidence and anticipated impacts of these trends—served as the grounds on which the panel built its discussions on the emerging technologies and practices influencing postsecondary teaching and learning.

As they provided their inputs and engaged one another in discussion, panelists were encouraged to share news articles, research, and other materials that would help reinforce their inputs and provide evidence for their particular viewpoints on current and future trends. In addition to enriching the panel's discussions and supporting the panel's voting and consensus processes, these materials were collected by EDUCAUSE staff for use as evidence and further reading in the writing of this report. In the Delphi and IFTF methodologies, these collected materials also serve the purpose of ensuring that the panel's future forecasts are sufficiently grounded in "real" data and trends.

Panel Questions

STEEP Trends

Round 1 (for each STEEP trend category):
Please use the discussion board below to propose trends. Examples of social trends are behaviors, demographics, beliefs, lifestyles, values, cultural concepts, family, aspirations, life stages, mobility, etc.

When proposing an original trend:

First, copy and paste the titles below in your post. Do not make any changes.

[TREND]
[SIGNAL]
[IMPACT]

Next, enter the information about the trend, signal, and impact following each bracketed label. Enter each trend in a separate discussion post. Access each of the STEEP categories by clicking the labels above. An example of this process can be found below in the discussion. Responses to others do not need to follow this format. We encourage you to engage with posts of your colleagues as well. Rich discussion helps improve the data we are able to collect for the next step of the process. Please note agreement or disagreement, and provide additional signals or counterfactuals that support your position.

Round 2 (for each STEEP trend category):
The list below summarizes the Social Trends provided by this year's Horizon panel. From this list, please select the top six (6) trends you believe will have the most influence on the future of teaching and learning. Drag those six (6) items from the left-hand list to the right-hand list, then rank them in the order of most influential (1) to least influential (6).

Key Technologies and Practices

Round 1: For this round of information gathering, we're interested in hearing from you about those key technologies and practices that you believe will have a significant impact on the future of teaching and learning in higher education. There are no right or wrong answers—use your imagination, be bold, and don't feel limited by what you think others on the Horizon panel may or may not have included in their responses. We want your voice reflected in these responses!

What do we mean by "key technologies and practices"? For the purposes of the *Horizon Report*, these are teaching and learning practices that are either new or for which there is substantial, perhaps transformative, new development. An important dimension of these technologies and practices is that they have the potential to have significant impacts and effects on postsecondary teaching and learning (or are already having such impacts).

Each answer should include three elements: 1) the key tech or practice, 2) a brief explanation of why you believe this tech or practice will have a significant impact on the future of teaching and learning in higher education, and 3) an example of a program or institution that exemplifies this key tech or practice.

When proposing a technology or practice, copy and paste the template below for your post. Do not make any changes; simply fill in the blanks. Please use a separate post for each technology and practice.

[TECH OR PRACTICE]
[IMPACT]
[EXAMPLE]

Round 2: The list below summarizes the key technologies and practices provided by this year's Horizon panel. From this list, please select the top twelve (12) items you believe will have the most influence on the future of teaching and learning. Drag those twelve (12) items from the left-hand list to the right-hand list, then rank them in the order of most influential (1) to least influential (12).

Round 3: Panelists were asked to respond to the following questions about each of the top six techs and practices, with these ratings used to consider important differences and similarities between each:

- How much professional development or training will users require for <tech/practice>?
- How useful will <tech/practice> be in helping institutions address issues of equity and inclusion?
- Thinking about the evidence currently available, how would you rate the potential of <tech/practice> to have a significant and positive impact on learning outcomes?
- Thinking about the potential negative effects that could result from this tech or practice, how would you rate the risk involved in adopting <tech/practice>?
- Overall, how receptive would you say learners and instructors would be to <tech/practice>?
- Relative to institution size and budget, how much institutional spending do you anticipate would be required for optimizing <tech/practice>?
- Thinking about the evidence currently available, how would you rate the potential of <tech/practice> to have a significant and positive impact on institutional strategic goals?

EXPERT PANEL ROSTER

Kathe Pelletier
Director, Teaching and Learning Program
EDUCAUSE

Jenay Robert
Researcher
EDUCAUSE

Nicole Muscanell
Researcher
EDUCAUSE

Mark McCormack
Senior Director of Research and Insights
EDUCAUSE

Jamie Reeves
Director of Community, Product, and Portfolio Management
EDUCAUSE

Nichole Arbino
Communities Program Manager
EDUCAUSE

Susan Grajek
Vice President for Partnerships, Communities, and Research
EDUCAUSE

Bryan Alexander
President
Bryan Alexander Consulting, LLC

Elisha Allen
Director, Online Strategies & Academic Technologies
University of New Mexico

John Augeri
Program Director / Researcher
Île-de-France Digital University

Sarah Beltrame
National Manager, Library Learning & Teaching
Australian Catholic University

Tracey Birdwell
Program Director, Mosaic Initiative
Indiana University

Kim DeBacco
Senior Instructional Designer
University of California, Los Angeles

Camille Dickson-Deane
Senior Lecturer Higher Education
University of Technology Sydney

Ebony English
Endowed Professor for Teaching and Learning, Professor of Social Work
Community College of Allegheny County

Janet Frizzarin
Program Manager, Senior Specialist Digital Learning
Lodz University of Technology

Maya Georgieva
Senior Director, Innovation Center / XR, AI, and Quantum Labs
The New School

Lauren Hays
Assistant Professor of Instructional Technology
University of Central Missouri

Helen Heinrich
Associate Vice President for Academic Technology
California State University, Northridge

Amy Heitzman
Deputy CEO and Chief Learning Officer
UPCEA

LeRoy Hill
Director, Centre for Excellence in Teaching & Learning (CETL)
University of the West Indies at St. Augustine

Glori Hinck
Senior Instructional Designer
University of St. Thomas

Laura House
Director, Instructional Design, Stanford Center for Professional Development
Stanford University

James Hutson
Lead XR Disruptor, Professor, Department Head
Lindenwood University

Avi Hyman
Director, Academic, Research & Collaborative Technologies
University of Toronto

Isa Jahnke
Founding Vice President for Academic and International Affairs
University of Technology Nuremberg

Eric Kunnen
Senior Director, IT Innovation and Research
Grand Valley State University

Wendy Lampner
Director of Online, Continuing, and Professional Education
University of Akron

Reba-Anna Lee
Assistant Dean, Distance Learning
School of Professional Studies
Northwestern University

Tatiana Levi
Senior Advisor to Executive for Education, Technology and Future of Work
US State Department, Foreign Service Institute

Jenna Linskens
Director, Learning & Innovative Technologies
Ithaca College

Danny Liu
Associate Professor
University of Sydney

Dave Long
Associate Director, Enterprise Instructional Technology
The University of Iowa

Valerie Lopes
Professor
Seneca College

Jean Mandernach
Executive Director, Center for Innovation in Research on Teaching
Grand Canyon University

Shannon McCarty
Vice President, Learning and Instruction
Calbright College

Claudia Moessenlechner
Head of Learning Solutions
MCI, the Entrepreneurial School

Ayla Moore
Senior Instructional Designer
Fort Lewis College

Christa Morrison
Business Systems Specialist
McMaster University

Eric Mosterd
Assistant Director, Center for Teaching & Learning, and Regents Fellow for e-Education Initiatives
The University of South Dakota, South Dakota Board of Regents

Mary-Kate Najarian
Director of User Success and Learning Technologies
Montgomery County Community College

Jamie Nelson
Assistant Director, Emerging Educational Technologies
University of Illinois at Urbana-Champaign

Scott Nelson
Manager of Instructional Media
The Ohio State University

Miranda Novak
Assistant Director of Instructional Technology
College of Saint Benedict / Saint John's University

Daniel Pell
Teaching, Learning and Technology Specialist
University of Wisconsin–Madison

Anthony Picciano
Professor
Hunter College–CUNY

Alexandra Pickett
Director, Online Teaching
State University of New York, SUNY Online

Anna Porcaro
Executive Director of Online and Adult Learning
Wichita State University

Parke Rhoads
Founder
Viewfinder Innovation

Beth Ritter-Guth
Associate Dean of Online Learning and Ed Tech
Northampton Community College

Michelle Rogers
Director of IT Teaching & Learning Services
University of Rhode Island

Fernando Rubio
Director, Professor
University of Utah

Rayan Rutledge
Principal Architect
AT&T

Jeannine Shantz
Director, Research, Evaluation & Assessment, Charles D. Close School of Entrepreneurship
Drexel University

Lalitha Subramanian
Program Management Director
University of Washington Continuum College

Alice Swift
Multimedia Instructional Designer
University of Hawai'i System

Maylyn Tan
Assistant Dean, Academic Development
Singapore Institute of Management

Peter van Leusen
Director, Digital Learning Initiatives, Ira A. Fulton Schools of Engineering
Arizona State University

Kevin Wagenmaker
Director of Instructional Innovation
Montcalm Community College

Jess Williams
Assistant Director, Teaching & Learning
Texas State University

Ted Witt
Teaching Learning and Technology Consultant
University of Wisconsin–Whitewater

Johann Zimmern
Global Education Lead
Zoom