

2021 EDUCAUSE Horizon Report[®]

Teaching and Learning Edition



2021 EDUCAUSE Horizon Report® Teaching and Learning Edition

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EXECUTIVE SUMMARY

The COVID-19 pandemic has transformed the higher education landscape. Though it remains to be seen whether those transformations have taken root and will persist into the future, it isn't hard to imagine that higher education may never be the same in some important ways (good or bad). Indeed, the potential lasting effects of the pandemic loomed large in our Horizon panelists' discussions and nominations this year as they identified the trends, technologies, and practices shaping the future of teaching and learning. This report summarizes the results of those discussions and nominations and serves as one vantage point on where our post-pandemic 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

- Remote Work/Learning
- Widening of the Digital Divide
- Mental Health Issues

Technological

- Widespread Adoption of Hybrid Learning Models
- Increased Use of Learning Technologies
- Online Faculty Development

Economic

- Decreasing Higher Education Funding
- Demand for New/Different Workforce Skills
- Uncertainty in Economic Models

Environmental

- Climate Change
- Reduction in Work Travel
- Sustainable Development

Political

- Increase in Online Globalization
- Rise of Nationalism
- Public Funding for Higher Education

Key Technologies and Practices

Horizon panelists were asked to describe those 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 list that initially consisted of 141 technologies and practices:

- Artificial Intelligence (AI)
- Blended and Hybrid Course Models
- Learning Analytics
- Microcredentialing
- Open Educational Resources (OER)
- Quality Online Learning

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 that are of growing importance in higher education: equity and inclusion, learning outcomes, risks, learner and instructor receptiveness, cost, and (new this year) importance for more flexible approaches to teaching and learning. We also asked panelists to consider whether new literacies might be required by these six technologies and practices.

Three of the six technologies and practices identified this year (learning analytics, OER, and AI) are returning entries from previous years' reports, suggesting some continuity in post-pandemic higher education even in the midst of so much change and disruption. Microcredentialing makes its first appearance in the *Horizon Report* this year, perhaps due to the flexible and just-in-time forms of education they might enable post-pandemic. The topics of blended and hybrid course models and quality online learning are new to the *Horizon Report* this year as well, though both are consistent with our focus in the 2020 report on instructional design. These inclusions also illustrate the continued importance of thoughtful design and flexible course models for higher education in the future.

Scenarios

Scanning the trends and technologies and practices sections, 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 brief but evocative portraits of four possible future scenarios for postsecondary teaching and learning:

- **Growth:** The acceptance of and enthusiasm for online and hybrid courses have been routinized and monetized, and alternative microcredentialing and lifelong learning programs have provided institutions with expanded revenue streams. Demand for faculty development programs has increased, as has faculty commitment to designing richer and more robust learning experiences for their students.
- **Constraint:** Higher education emerges from the COVID-19 pandemic leaner and with fewer resources with which to operate. For some institutions, “doing more with less” means doing more for fewer students and reifying traditional models of education and funding. For other institutions, it means strengthening a commitment to sustainability, diversity, equity, and inclusion and embracing alternative and innovative models for educating more students more efficiently.

- **Collapse:** State funding for public higher education institutions has dried up, and institutions dependent on tuition-based operating budgets have been unable to survive declining student enrollments. Academic research is far less collaborative and community-based, far more reliant on corporate funding and political and economic agendas. Remote teaching and learning has slid comfortably into mediocrity, driven by values of efficiency and lacking critical infrastructure and faculty development resources.
- **Transformation:** Higher education embraces an “anyone anywhere” model of education, opening up greater access for more people to pursue degrees and credentials through learning technology and design and debt forgiveness and free tuition programs. Student mental health improves as institutions implement more humanized and relational forms of learning, and postsecondary education enrollment rates balloon to historically high levels around the world.

Implications Essays

In light of the trends and future scenarios presented throughout this report, what can we say about the implications for institutions now and about what institutions can begin to do today to start preparing for these possible futures? For this section of the report, we asked five Horizon panelists to reflect on the report's findings and offer their thoughts on the most important implications for their own higher education context. Representing institutions from Australia, South Africa, Turkey, and the United States, the five perspectives represented in these essays illustrate that even across such different geographic and cultural contexts there is a striking degree of similarity across international higher education. Issues such as collaboration and flexibility, addressing the inequalities exposed by the pandemic, open learning ecologies and new pedagogical blends, and issues of funding are ones that cross national boundaries and bridge institutional types.

TRENDS: SCANNING THE HORIZON

In seeking to map out the possible futures for teaching and learning in higher education, we must begin by understanding the larger trends taking shape in the world outside the walls of the institution. Education, after all, always takes place in a particular time, made up by particular people, located in particular communities and spaces, and subject to a variety of trends or forces. Where higher education is today, and where it is going on the road ahead, is in many ways bound to and dependent on those particularities.

To ensure the discussions provide an expansive view of the global landscape, we asked panelists to identify trends across five categories: social, technological, economic, environmental, and political. (We replaced last year's "higher education" category with "environmental" to be consistent with the Institute for the Future framework we've adapted for this report.)

For this year's Teaching and Learning *Horizon Report*, the COVID-19 pandemic loomed large in our expert panelists' discussions on the larger trends shaping higher education. Indeed, it is nearly impossible to overstate the effects the pandemic has had and will continue to have on every facet of our lives, including education. No matter the topic of discussion—our social lives, our dependencies on technology, or the economic outlook of our future—the pandemic's tendrils have wrapped around all of it. It is rather remarkable, then, that many of the trends identified for last year's *Horizon Report* (developed prior to the onset of the pandemic) are also the trends this year's panelists believed to be the most important. Mental health. The digital divide. Funding for higher education. These trends were important before the pandemic, and they remain important today and likely will be tomorrow.

What has changed since last year's report, though, are the ways in which panelists discussed these trends and reflected on their implications. Mental health issues and the digital divide have only been exacerbated by the pandemic. Concerns over funding now also include the perceived value (and cost) of the online education now being offered at most institutions relative to in-person education. It all feels so different this year, and yet much is the same.

Parallels aside, a good number of the trends in this year's report are in fact new. All of the trends in the "technological" category are new this year, perhaps not surprisingly, given the widespread migration of education to remote or online modes of delivery.

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

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—54% of whom represent communities outside the United States, including Australia, China, Egypt, France, Taiwan, and the United Kingdom—routinely reflected on the ways in which trends affect institutions differently across global 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 those considerations.

Social

Remote Work/Learning

Widening of the Digital Divide

Mental Health Issues

Technological

Widespread Adoption of Hybrid Learning Models

Increased Use of Learning Technologies

Online Faculty Development

Economic

Decreasing Higher Education Funding

Demand for New/Different Workforce Skills

Uncertainty in Economic Models

Environmental

Climate Change

Reduction in Work Travel

Sustainable Development

Political

Increase in Online Globalization

Rise of Nationalism

Public Funding for Higher Education

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

Remote Work/Learning

Impacts: Over the course of 2020, many facets of social life have become remote in nature, from high school graduations to weddings to business meetings, and some of these might remain remote long after the pandemic subsides. Remote modes of higher education will live on in some form or another in a post-pandemic future, and we may never return to pre-pandemic baseline levels of deployment. Faculty and instructional staff will need to continue to discover innovations supported by technology and pedagogical design to provide instruction that is socially and emotionally supportive and flexible enough to adapt to a wide range of student needs. Students will need to develop new skills and literacies to be better equipped for remote learning and to better thrive in more isolated and independent virtual environments.

Evidence: Over the course of just one week in 2020, the [Microsoft Teams app](#) saw its number of users increase from 32 million to 44 million, with users in China *doubling* even after coronavirus restrictions were lifted. In a recent [EDUCAUSE QuickPoll](#), two-thirds of CIOs reported that their institution would continue to allow (or even require) remote work post-pandemic.

Widening of the Digital Divide

Impacts: The COVID-19 pandemic has laid bare the digital inequities that exist between students sharing the same courses. To the extent that higher education in the future will continue to rely on remote technologies and digital networks for course delivery and learning experiences, the gap will only widen between those with every digital advantage and those who struggle to gain access to even the basic devices and network necessities. These gaps will become evident among students not only over the course of their postsecondary education attainment but, in many cases, long before they enter college. With the divide

beginning to emerge earlier in K–12 experiences and becoming even more pronounced as a result of the pandemic, many students will begin their postsecondary education already far behind some of their peers.

Evidence: A [symposium](#) was held in September 2020 in France to discuss the impacts of the pandemic, concluding that “digital technology and a reflection on its uses are becoming a necessity in the learning ecosystem.” [The pandemic revealed](#) a digital divide in the Los Angeles school system: it was estimated that one in four households lack essential network access.

Mental Health Issues

Impacts: Already a perennial concern on campuses, mental health issues have been exacerbated by recent disruptions and changes to our social, political, and educational landscapes and have presented institutions with additional challenges in ensuring the safety and well-being of not only students but also faculty and staff. In many cases, students, faculty, and staff have experienced extended periods of time isolated from family, friends, and colleagues, and worsening economic and political conditions across many local communities have contributed to heightened feelings of worry and stress. Institutions exploring longer-term transformations to their business and/or educational models—particularly changes involving remote or virtual experiences—will also need to explore transformations to their student and employee support models to address the mental health challenges of their communities.

Evidence: As a response to the personal pressures caused by the pandemic, [discussions](#) have emerged among higher education and teaching and learning leaders focused on flexibility and the social dimensions of education. In a [survey](#) conducted earlier in the COVID-19 pandemic, a full 80% of college students reported that the pandemic had negatively impacted their mental health, and a fifth reported that their mental health had significantly worsened.

Further Reading

Inside Higher Ed

“Bridging the Digital Divide: Lessons from COVID-19”

EDUCAUSE

“Cultivating a Disciplined, Creative Mind and Humane Instincts”

Chronicle of Higher Education

“Did the Pandemic Worsen the Campus Mental-Health Crisis? Maybe Not, Data Show”

TECHNOLOGICAL TRENDS

The past year's disruptions and rapid changes, which forced so much of teaching and learning to be done remotely, have made digital technologies even more vital to higher education. What those technologies are, how they are deployed across the institution, and the ways in which they themselves continue to evolve may very well be one of the defining stories of higher education in the years ahead.

Widespread Adoption of Hybrid Learning Models

Impacts: Institutions' adoption of blended or hybrid models for course delivery has accelerated dramatically over the past year. Faculty and student discovery and attachment to new ways of engaging with one another through the learning experience seem likely to leave an indelible mark on the postsecondary classroom and fundamentally transform traditional approaches to higher education. In particular, learning models that enable flexible movement between remote and in-person experiences will help institutions minimize disruption and ensure continuity of course delivery through future crises.

Evidence: Since the onset of the COVID-19 pandemic, the majority of institutions have been supporting hybrid teaching and learning options for both on-campus and online education. San Diego State University is equipping nearly 200 of its classrooms with microphones to better support hybrid approaches to learning.

Increased Use of Learning Technologies

Impacts: As the adoption of blended or hybrid learning models has accelerated, so too has the adoption of new learning technologies and tools that support and even shape the implementation of those models. Institutions and instructors previously resistant or indifferent to tools such as videoconferencing, team-based platforms, and virtual classrooms have come to rely on those tools as essential ingredients in their work. Learning technology stands to become even more widely adopted on the road ahead, and the

discovery of new needs and uses for these and other course-related tools will lead to ongoing innovations and entirely new learning technologies.

Evidence: Ed-tech start-up Engageli launched its new videoconferencing platform, designed specifically for higher education use and for supporting hybrid synchronous and asynchronous learning experiences. In a fall 2020 survey, 83% of higher education IT leaders reported "improving the use of instructional tools" as a top priority for their institution in planning for the 2020–21 academic year.

Online Faculty Development

Impacts: Faculty buy-in, training, and support are essential for the adoption and effective use of technologies and other tools in the classroom. As institutions have deployed solutions for remote and online instruction, faculty have been called on to embrace new ways of working and learn new tools of the trade. Ongoing investments in faculty development, including remote capabilities for instructional design and technology support, will be needed to ensure faculty skills and literacy keep pace with ongoing technology advancements. New solutions for online learning and new models for student-centered course design will be effective only to the extent that faculty understand why and how to use them.

Evidence: The National Institute on Scientific Teaching and Macmillan Learning have teamed up to offer an online short course on scientific teaching. Many campuses (such as Union College, Georgia Southwestern State University, and Oregon State) are transitioning their online offerings to faculty or bolstering what they already offered.

Further Reading

Phil on EdTech

"COVID-19 Planning for Spring 2021: What We Learned about Hybrid Flexible Courses in Fall 2020"

EDUCAUSE

"Learning from a Crisis: Human + Machine"

EDUCAUSE

"The Landscape of Merging Modalities"

The global economy is in turmoil, and it remains to be seen when and how we will recover from the COVID-19 financial cataclysm. In the meantime, leaders of higher education institutions, many already fiscally challenged, will need to adapt to new financial realities and adopt new ways of thinking about and planning their institutional business.

Decreasing Higher Education Funding

Impacts: The pandemic has exacerbated higher education's already troubling financial crisis and has brought to center stage the public debate on the value of higher education generally and on the value of certain models of higher education specifically. Students and parents are questioning the value of remote or online modes of education relative to its cost, particularly compared to in-person learning, and enrollments and revenue across institutions will continue to decline as long as the adoption of new learning approaches is not accompanied by compelling evidence of its efficacy. Institutions that can adapt and demonstrate value in educating their students while controlling tuition will grow and thrive.

Evidence: A group of provosts representing research universities in British Columbia penned an [open letter](#) to their students, addressing student concerns around the quality of online learning. In a recent [EDUCAUSE QuickPoll](#), two-thirds of respondents reported budget cuts to their IT units for the 2020–21 academic year.

Demand for New/Different Workforce Skills

Impacts: The sudden shift to online service and course delivery across most institutions, and the potential of longer-term investments in these modes of delivery, have and will continue to create new demands for skills and staff in areas such as instructional technology and design for supporting faculty and students. Persistent experiences of disruption and crisis among the staff, along with renewed emphasis on well-being in the workplace, will raise awareness of and demand for transformative and human-centered styles of leadership and team management.

Evidence: McKinsey [released](#) a publication on what hundreds of executives envision for the post-pandemic workforce. Similarly, an article in *Forbes* described how colleges and universities [must reinvent themselves](#). An [article from Harvard Business School](#) suggested that “at least 16 percent of employees will remain at-home workers long after COVID-19 recedes.”

Uncertainty in Economic Models

Impacts: Local and national economies around the world have been devastated by the pandemic, resulting in astronomical rates of unemployment and widening inequities between socioeconomic classes. Policy makers and economists are at odds over if, when, and how we will recover, and institutions of higher education, as with most industries and organizations that make up the global economy, also face an uncertain future. Many institutions have implemented hiring freezes, layoffs, and/or budget cuts, and they will be called on to adopt more flexible and data-driven approaches to planning that can accommodate any number of possible future economic realities.

Evidence: Economists are rethinking old economic theories and searching for new ways to understand our present moment, as stated in an *Economist* article: “What is clear is that the old economic paradigm is looking tired. One way or another, change is coming.” [Foreign investments](#) in the US economy dropped 49% in 2020, and China emerged as the largest recipient of foreign investments for the first time ever.

Further Reading

EDUCAUSE

“The 60-Year Curriculum: A Strategic Response to a Crisis”

Reuters

“IMF Lifts Global Growth Forecast for 2021, Still Sees ‘Exceptional Uncertainty’”

EdSurge

“2020 Showed That Colleges Don’t Have Revenue Problems. They Have Funding Shortfalls”

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 the planning and doing of higher education, will be inescapable in a future more concerned with climate stability and environmental sustainability.

Climate Change

Impacts: The global effects of climate change are worsening and becoming a more present and urgent issue for building a sustainable future. Institutions of higher education are already living through these effects—experiencing flooding in coastal regions and bracing against severe weather events, droughts, and wildfires in other areas—and having to adapt their facilities, operations, and business and instructional models accordingly. These new realities also present opportunities, however, as institutions develop new research programs, curricula, and practices educating and equipping new generations of climate leaders.

Evidence: A record 312 institutions participated in the Sierra Club’s 2020 “Cool Schools” rankings, focused on celebrating sustainability goals and efforts to achieve carbon neutrality. The [International Universities Climate Alliance \(IUCA\)](#) was launched in April 2020 with the goal of promoting climate change research at dozens of institutions across the world.

Reduction in Work Travel

Impacts: Institutions have likely left much smaller carbon footprints behind them since the spring of 2020, with many students, faculty, and staff working remotely from home and no longer commuting to physical campus locations and with many institutions eliminating or drastically reducing work-related travel for staff and faculty. Institutions making long-term plans for remote operations and/or reduced travel are unlikely to return to pre-pandemic levels of resource consumption and environmental waste.

Evidence: According to [one study](#) by the International Civil Aviation Organization (ICAO), in 2020 the global airline industry experienced a 50% reduction in passenger seats offered, an overall reduction of 2.7 million passengers, and a loss of \$370 billion in industry revenues. Panelists for [EDUCAUSE’s 2021 IT Issues report](#) highlighted remote work as one factor driving transformation at institutions. As one panelist put it, “We’re starting to realize that, yes, we can have remote workers and we do not need all the office space, that we are able to continue doing business and actually doing business a little better.”

Sustainable Development

Impacts: Environmental and community activists are calling attention to the global opportunity that may now be before us to build a post-pandemic world rededicated to sustainable development goals (SDGs). Realities of environmental waste and social inequity have been brought to light through our collective crisis, and there may be a stronger will now than in recent years to pursue aggressive new policies and sustainable practices to address these issues. Institutions will be critical partners in this pursuit of a more sustainable future, through both curricula and operations that raise awareness of and support the importance of sustainability.

Evidence: The United Nations Department of Economic and Social Affairs released a [policy brief](#) declaring that SDGs “still offer the best option to reduce [the] worst impacts of COVID-19 and to recover better.” They highlight the importance of [SDG #4](#) specifically (inclusive and equitable quality education and lifelong learning opportunities for all), noting that COVID-related school closures have kept 90% of all students out of school and that remote learning remains out of reach for at least 500 million students.

Further Reading

New York Times

“At Elite French Universities, Students Demand Environmental Action”

Times Higher Education

“Top Universities for Climate Action”

Forbes

“Business Travel Demand Won’t Bounce Back in 2021, and Maybe Not for Years. That Will Be Devastating for Airlines.”

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.

Increase in Online Globalization

Impacts: Though global industries and collective human experiences dependent on physical gatherings have appreciably declined since the spring of 2020, new online platforms and opportunities for connection and relationship have emerged and promise to transform the global community in lasting ways. Investments and greater confidence in online learning will enable institutional collaboration on a more global scale and will contribute to new opportunities for global education.

Evidence: Already witnessing massive growth, the [online educations market is expected](#) to reach \$336B by 2026, with a compound annual growth rate of 9%. Despite the US higher education sector's efforts to attract international students, [new enrollment rates fell](#) by 5.5% at the graduate level, 6.3% at the undergraduate level, and 9.7% at the non-degree level.

Rise of Nationalism

Impacts: Global politics is becoming more fractured as nations have made an inward turn—what some have called “de-globalization”—withdrawing from international organizations and agreements, building stronger barriers to immigration, and escalating conflicts (trade, military, or otherwise). Institutions of higher education, built on the foundations of the open and free exchange of ideas and international collaboration, will be challenged to maintain those traditions despite these fortified national boundaries. They will be called on to establish policies and practices that reflect the nature of national relationships and agreements and to evaluate their approaches to educating and preparing students as global citizens.

Evidence: A [Pew Research Center](#) survey of technology leaders found that half of them believe technology usage “will mostly weaken core aspects of democracy and democratic representation.” In a [recent dialogue](#), international scholars discussed the role of digital media in socializing and shaping students' political views and feelings, and the potential role for postsecondary institutions in developing students' critical thinking skills and dismantling hate speech and anti-democratic opinions that have emerged through digital media.

Public Funding for Higher Education

Impacts: Institutions dependent on state and federal funding to support their students and operations must continuously adapt their resources and capabilities according to the shifting sands of political favor. Federal pandemic funds have been a life preserver for some institutions and wholly insufficient for others, and changes in political power and priorities over the next several years may have important implications for whether and to what extent institutions continue to be valued as critical for economic and community growth.

Evidence: In Australia, the [parliament has passed laws](#) that will dramatically increase the cost of some university degrees while cutting the cost of others. In the United States, in the fall of 2019, [nearly 250,000 fewer students were enrolled](#) in higher education than in the fall of 2018, and enrollments are down 11% over the past decade. Enrollment at community colleges is down about 100,000 from the fall of 2018.

Further Reading

Center for Studies in Higher Education, UC Berkeley
[“Neo-Nationalism and Universities in Europe”](#)

Harvard Business Review
[“Will COVID-19 Have a Lasting Impact on Globalization?”](#)

Ithaka S+R
[“Reimagining State Higher Education Funding”](#)

KEY TECHNOLOGIES & PRACTICES

Last year the *Horizon Report* renamed this section to include the concept of practices as a counterbalance to a single-dimensional focus on technologies. This year we have adjusted the name further, replacing “emerging” with “key.” In terms of its importance for moving teaching and learning forward, the newness of a technology or practice is less relevant than its being key for future planning.

This shift allows these categories to come, go, and return across the reports more organically, reflecting the most current issues. As we have witnessed over the past 18 months, shifting circumstances and new developments can renew (or reduce) a category’s relevance. This year, the categories of AI, open educational resources, and analytics return; new are those of blended and hybrid models, quality in online learning, and microcredentials. It is clear that the pandemic experience has led us to place continuing emphasis on the first three, and, for the same reason, the appearance of the other three comes as no surprise.

To compose these essays, the authors (including Rob Gibson of Emporia State University and Katie Linder at Kansas State University) used both the panel’s results and the projects submitted by the community in the annual call for exemplar projects. For 2021, the teaching and learning *Horizon Report* received a record number of submissions (255) from its call for exemplar projects, and taken together they paint a fairly comprehensive picture of current directions for each of the six technologies and practices.

The quantitative distribution of the exemplar projects clustered into three groups with respect to category. The two largest were quality online learning (29% of the total) and OER (26%). The middle cluster included microcredentialing (17%), learning analytics (11%), and blended/hybrid (10%). AI was alone in its own set (7%). The top four are by no means new, so the combination of past work and the pandemic context explains why the preponderance of submissions were in those categories. It also suggests that AI is just getting under way in teaching and learning, no doubt with much more to come. In terms of the geographical distribution of the projects, 33% were non-US. This year the countries contributing projects aside from the United States included Australia, Austria, China, Egypt, France, Germany, Japan, the Netherlands, New Zealand, Pakistan, South Africa, Sweden, and the UK.

Artificial Intelligence

Blended and Hybrid Course Models

Learning Analytics

Microcredentialing

Open Educational Resources

Quality Online Learning

For 2021 we continue to provide a dimensional analysis for these key technologies and practices. As in 2020, we asked our panelists to assess the challenges and benefits institutions might encounter if they go forward with any of these six. For this year, given the demanding presence of the pandemic, we have added a dimension to this analysis by asking our panelists to assess the continued importance of the tech or practice as we begin to emerge from the pandemic. We asked panelists to evaluate each technology or practice across several dimensions, using a five-point scale (0 = none, 4 = highest). The dimensions for 2021 are:

- How useful will it be in addressing issues of equity and inclusion?
- What is its potential to have a significant and positive impact on learning outcomes?
- What is its risk of failure?
- How receptive will faculty be to adopting it?
- What level of institutional funding will be needed to adopt it?
- How important do you think it will be for institutions seeking to establish more flexible approaches to teaching and learning as we begin to emerge from the pandemic?

We also asked panelists to indicate whether each of these technologies and practices would require new kinds of literacies on the part of learners and instructors.

In this way, we asked the panelists not simply to identify what might be impactful but to anticipate just what that impact might be. These results are presented in the charts that accompany the discussions of the technologies and practices.

ARTIFICIAL INTELLIGENCE

To little surprise, AI returns in 2021 as a key technology. As its use is just getting under way in teaching and learning, it is likely to return. In 2017, an [EDUCAUSE 7 Things publication](#) defined AI as “computer systems that undertake tasks usually thought to require human cognitive processes and decision-making capabilities,” and that definition still seems apt. While the pandemic has brought entire industries to a near halt, artificial intelligence appears to have been able to sustain its progress at a near breakneck pace, and the danger of another “AI winter” seems remote. According to the [2021 AI Index](#), progress in natural language processing has been so swift that “technical advances have started to outpace the benchmarks to test for them.” Outside higher education, examples of the feats of AI continue to pile up—for example, an [international team developed an AI system](#) that can detect prostate cancer from odor as accurately as dogs. AI has advanced to “self-supervised learning,” an advance on deep learning in which a computer system can learn from raw or non-labeled data. This means that AI systems could learn simply by watching videos. In addition, AI is “industrializing,” quickly leaving the research lab, in search of industrial applications. The 2021 AI index noted that in 2019 “65% of graduating North American PhDs in AI went into industry,” compared to 44% in 2010.

Overview

AI is appearing throughout higher education teaching and learning, in domains such as learning management systems, proctoring, grading/assessment, student information systems, office productivity, library services, admissions, disability support, and mobile apps to name a few. In some [recent discussions](#) on AI and higher education, two key points of relevancy have emerged. The first is that AI can be used to address standing or current challenges in teaching, learning, and learner success. The second is the opportunity to thoroughly rethink the curriculum and associated academic programs in a way that will better serve “[Generation AI](#).”

As illustrated by the responses from the *Horizon Report* call for exemplar projects, most of the current use of AI in higher education appears to be focused on applications relevant to the first point. For example, bots are the heart of several projects submitted. At [Durham University](#) in the UK, staff are using Holly, an AI “student engagement platform,” to promote student success through the admissions process. The [University of British Columbia](#) has a project under way called Language Chatsim. Knowing that immersion is an effective way to learn a language, Language Chatsim allows a student “to practice speaking with an avatar in a virtual environment.” The avatar is connected with a chatbot that can deliver natural responses to the student. A bot at the [University of Illinois Chicago](#) called Socrates and an off-the-shelf bot deployed at [Abraham Baldwin Agricultural College](#) further illustrate the use of bot technology in higher education.

Artificial Intelligence in Practice

AI Campus

Funded by the German Federal Ministry of Education and Research, AI Campus is a digital learning platform specifically geared toward the development of AI skills and competencies. The learning environment is focused on learners and is aimed at developing learning opportunities that specifically address the needs of individual sectors or specialist areas. Institutions such as Goethe University are using the platform to support micro-degrees for topics related to AI.

Ethical and Legal Challenges in Relationship to AI-Driven Practices in Higher Education

This project seeks to study the ethical and legal challenges related to the emergence of AI-driven practices in higher education, focusing mainly on predictive analytics. Among the goals are the generation of knowledge about how to engage with ethics and legal challenges of AI in higher education from the ground up and the design of the Swedish Observatory for Responsible AI in Education to nurture the emergence and growth of just, caring data-driven practice. The principal investigators are faculty at Stockholm University.

Another type of application might be called “AI comes to learning analytics.” The University of Iowa’s **Digital Learning Scorecard** uses machine learning to “identify students who are struggling academically.” Penn State’s Spectrum uses natural language processing to analyze transcripts of course sessions, enabling it to “reflect back to teachers different patterns and data points across an entire semester.” The New Zealand **Mind Lab** is using AI to develop sentiment analysis tools to investigate the attitudes and emotions of students when they are interacting on social media about their course experience. These analyses “have provided a better understanding of students’ online sentiment relating to the activities and assessments of the programme.”

As for the second point of relevancy—rethinking the nature and structure in a world in which AI is well on its way to becoming commonplace—it would appear that higher education is just getting started. The **FLoRA project** is an international research collaboration involving institutions from the UK, Germany, the Netherlands, and Australia. The project seeks to address the importance of metacognitive skills (or “self-regulated learning” or SRL). Researchers are employing machine learning to better understand student SRL processes and to “facilitate student’s SRL by providing personalized scaffolds.” WeLearn, a project originating at the **Center for Research and Interdisciplinarity** in Paris, enables semantic-localized knowledge sharing through the implementation of AI algorithms using a browser plugin. Learning resources are semiautomatically indexed and visualized on a “map of concepts”; they can then be connected according to relevant complementarity and proximity criteria. Knowledge holders can be matched and interact if interested in doing so, thus creating a multitude of knowledge communities. At the **University of Stockholm**, a project is under way that “concerns the study of ethical and legal challenges related to the emergence of AI-driven practices in higher education, focusing mainly on Predictive Analytics.” Among its many goals is the ambition to “generate knowledge of how to engage with ethics and legal challenges of AI in HE from the ground up” and to design “the Swedish Observatory for Responsible AI in Education.”

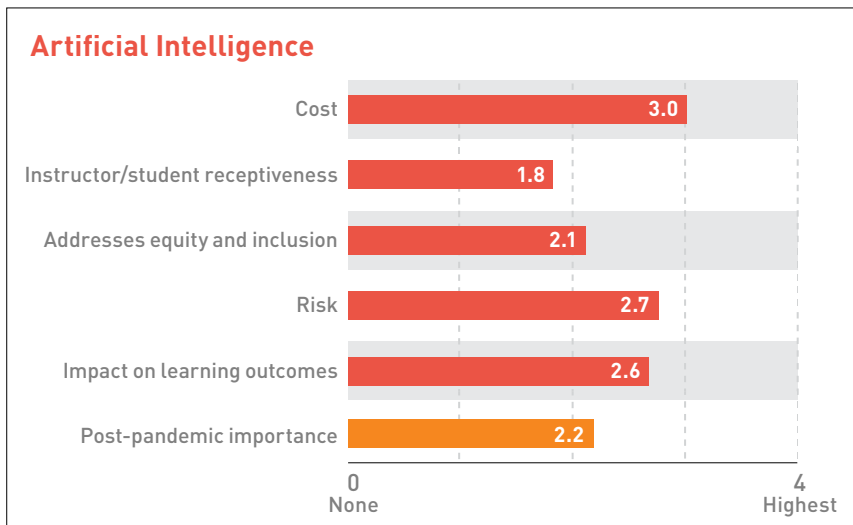
Facilitating Self-Regulated Learning with Personalized Scaffolds

Self-regulated learning (SRL), sometimes called metacognition, is the ability to monitor and productively adapt one’s learning process. The FLoRA project, a collaboration of institutions from the UK, Germany, the Netherlands, and Australia, is a research effort that seeks to develop machine learning techniques to gain better measurement and understanding of SRL processes and to develop personalized scaffolds to encourage students’ metacognitive skills.

Natural Language Processing for Analysis of Student Online Sentiment

Using sentiment analysis tools, researchers in New Zealand are analyzing social media posts by a cohort of students with the goal of addressing the question: How does a natural language processing tool help analyze student online sentiment in a postgraduate program? By visualizing the sentiment scores from the analysis, researchers have been able to better understand students’ online sentiment relating to the activities and assessment. This research is centered at the Mind Lab, a New Zealand-based private training establishment.

Relevance for Teaching and Learning



As it has been since its conception, AI remains controversial. Perhaps the most high-profile debate has been about the use of AI within proctoring and examination products, which has spurred a flurry of passionate dialogue. An **educational technologist** who voiced concerns about student privacy regarding the use of one such system was abruptly met with litigation by a purveyor. **Some universities have been sued** for their use of AI systems that collect biometric data to track and monitor progress and academic integrity without students' consent. Another immediate issue confronting higher education with respect to AI is academic integrity. Already one site, available at US \$10 per month, offers an application that uses the "power of paraphrasing" to avoid plagiarism detection so that the student is left with time "to focus on more important things." Higher education may find it necessary to fight fire with fire, using AI systems to combat the use of other AI systems in ways that violate academic integrity standards.

The arrival of AI in higher education has opened a Pandora's box. Going forward, higher education will need to be a careful and ethical user of AI. Familiar are the problems of bias in AI technology and of the ethics of data capture and usage. A report on a poll conducted by Gallup and Northeastern University, appropriately titled "**Optimism and Anxiety**," states that 75% of Americans believe that AI will eliminate more jobs than it creates. Higher education has a role to play in working with students and communities to navigate the dislocations that the move to AI is bringing with it. This is why the second point of relevancy, the reimagining of higher education's teaching mission, is of the utmost importance: the overall, long-term relevancy of higher education may depend on it.

Spectrum

This project at Penn State University applies natural language processing to the transcripts of a course's sessions. Using visualizations, the application is designed to support reflective teaching practices by making the results of the analysis available to instructors. Instructors can use Spectrum to analyze the content and context of every sentence spoken in a class session, identify relationships between topics covered in a course, and explore how those topics interleave.

WeLearn

Aiming to identify and empower communities of knowledge, WeLearn is an open, web-based plugin that enables semantic-localized knowledge sharing and concept mapping through the implementation of AI algorithms. The project uses articles from Wikipedia and academic journals as part of the basis for its concept maps. WeLearn is a project of the **Center for Research and Interdisciplinarity** in Paris.

Further Reading

Commonwealth Scientific and Industrial Research Organisation (Australian National Science Agency)
[Artificial Intelligence Roadmap](#)

Human-Centered AI Institute, Stanford University
[The AI Index 2021 Annual Report](#)

Wall Street Journal
["Colleges Mine Data on Their Applicants"](#)

BLENDING AND HYBRID COURSE MODELS

Up until now higher education has, for the most part, been evolving its way forward—sometimes enthusiastically, sometimes hesitantly—in its adoption of online and blended course models. But the pandemic delivered a seismic jolt that greatly accelerated this evolution, forcing higher education to become inventive and create an array of new course models to cope with a truly unique situation. Especially challenging was the fact that often the hybrid models crafted over the summer of 2020 had to be modified almost on the fly, according to the ebbs and flows of the pandemic. The result is that higher education now uses a wide and diverse spectrum of course models—so diverse, in fact, that the terminology can be confusing. Entire articles have sought to **sort out** the terms used for these **new course models**. Indeed, some institutions have appended the term “flex” to their institutional name or initials in order to **designate their own set** of new course models. Whatever names one might use for these course models, it is clear that higher education has diversified quickly and that these models are here to stay.

Overview

In this year’s annual call for exemplar projects, nearly two-thirds of the responses for the blended/hybrid practice concerned faculty development or the refitting of classrooms. This makes sense: in the sudden necessity for hybrid models, courses needed redesign, faculty required new expertise, and classrooms, especially for the 2020–21 academic year, needed to be able to support the new hybrid models.

Given that nearly all faculty have needed support to navigate the pandemic transitions, individualized support has not always been practical. In light of that, many institutions have developed frameworks and used them as the basis for workshops, often delivered in virtual environments. **Wichita State University’s website** offers faculty five choices of hybrid models. Because technology interruptions and issues have become more common during the pandemic, **Penn State University** launched a Tech TA program, whose purpose is to provide faculty with real-time support so that the instructor can “focus on the learning experience of their students.” These Tech TAs provide pre-course assistance and then attend the class meetings remotely to assist with technology issues. The Tech TA program has been implemented across all 23 of Penn State’s campuses.

With respect to classrooms, projects at **Bentley University** and the **University of Florida** aimed to install technology across a large number of classrooms in order to support 2020–21 hybrid courses. Bentley’s AV vendor called that project “the largest single-project... integration that we know of for a university in the Eastern US,” while the team at UF installed technology upgrades in more than 220 classrooms in a 14-week period. A team at the University of Massachusetts Amherst standardized improvements by **developing a “hybrid learning tech package”** that was deployed at the UMass Amherst and Mount Ida campuses. Leaders at Northeastern University have **invested millions of dollars** to install technology in 200 classrooms and see the investment not just as a temporary fix but as the way to lay the basis to continue to use hybrid models after the pandemic.

Blended and Hybrid Course Models in Practice

Digital Dream Play

In this project at the University of British Columbia, students, faculty, and staff staged a play virtually, August Strindberg’s *A Dream Play*. Using off-the-shelf technology, they worked to allow distanced actors to merge with one another through virtual environments, enhanced by in-the-theatre lighting and sound operated from a student team in Tokyo and San Francisco.

Adaptability, Connection, and Equity (ACE) Framework

Plymouth State University has developed a framework to guide decision-making and professional development planning. ACE elevates three characteristics that are clear, context sensitive, values driven, and mission aligned, and Plymouth uses them to plan assignment-, course-, and institution-level responses to crises (such as COVID-19). ACE is openly licensed, as is a four-week workshop to help faculty reconsider course design for the COVID and post-COVID eras.

Some institutions have chosen to include learners in their course redesign processes. At **Fort Lewis College**, “student voices are a foundational component” of their hybrid designs, supporting their goal to “meet the needs of students and faculty.” Student work teams are at the center of the 3-CI instructional model (“pre-class, in-class, and after-class”), developed at **Shanghai Normal University**. In this approach, students are “invited to participate in curriculum implementation and decision making.”

Technology, as always, has offered ways to meet the challenges of a fast-paced move into the online dimensions of hybrid learning. Hudson Valley Community College has exploited XR to develop a set of **virtual field simulations** for students in their early childhood development curriculum. They have also constructed ways utilizing Blackboard tools and Zoom to conduct **foreign language courses**. The **University of Illinois at Chicago** has worked with a vendor to support hybrid courses, integrating that application with their LMS. The enhancements include an extended gallery view in Zoom and additional breakout rooms.

This expansion of blended and hybrid models has also cast a spotlight on the importance of what could be called “learner development,” in parallel to the long-emphasized “faculty development” practices done at nearly every institution. Instructors and learners alike have experienced deep dislocations, necessitating recalibration in many dimensions. Santa Clara University developed **a course for students** called LEVL Up (Learning and Engaging in Virtual Learning), which “encourages students to adapt to the reality that their learning and most extracurricular activities will be online, while providing resources to ensure virtual student success.” It is also interesting to note that in the midst of all the innovation, some traditional practices are still highly relevant. In late spring 2020 a **survey** was conducted by Every Learner Everywhere, Digital Promise, and Tyton Partners to measure and gauge the student experience of the sudden shift to remote learning. The survey analysis, published in July 2020, reported that student satisfaction increased as larger numbers of traditional practices were incorporated into the course, such as frequent formative assessments, breakout groups during live course meetings, and check-in messages to individual students.

The pandemic context has further required higher education to consider new elements to be addressed in these new hybrid models. Humanizing one’s online teaching has **long been a point of consideration**, and the pandemic has added a deeper dimension to this, calling attention to the mental and social health of its instructors and learners. The **EDUCAUSE 2020 Student Technology Report** determined that the “most commonly reported type of disability is a mental health disorder, which half of students who reported a disability told us they have.” Jisc has published a **code of practice** for well-being and mental health analytics.

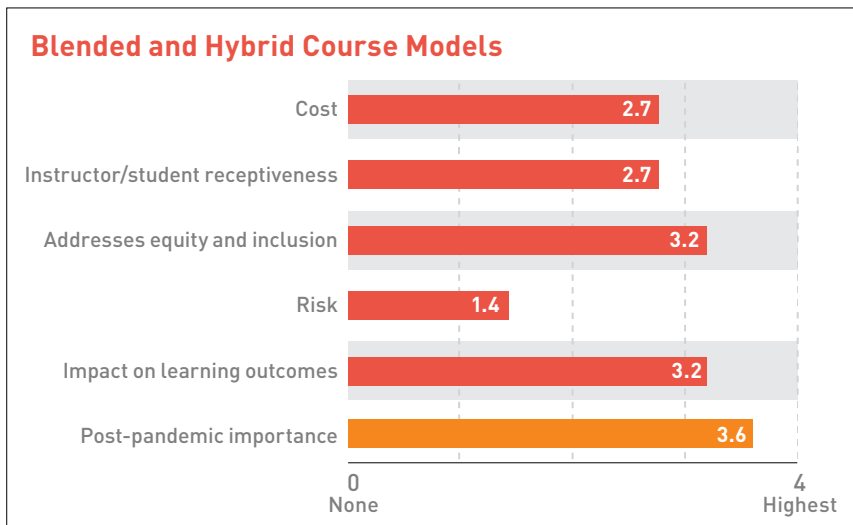
c3Design

The University of Virginia created c3Design, an interactive online learning environment designed to guide instructors through the iterative, dynamic, and scholarly process of backward-integrated course design. As instructors progress in the design process, c3Design collects their design decisions using interactive forms, and interactive schedule and syllabus builders are available to construct the syllabus. Instructors can also evaluate their design using an award-winning rubric and share their courses with other instructors.

Scaling HyFlex for the Post-COVID Campus

Is HyFlex something that the institution can and will adopt permanently? Using Beattie’s **four values** for HyFlex course design, Fort Lewis College responded affirmatively to this question, identifying HyFlex not just as a means to navigate the pandemic but also as a mainstream, post-pandemic course model. Their steps included a structured pilot, a new approach to classroom technology, and the solicitation of student input.

Relevance for Teaching and Learning



Looking to the future, one “cost” of the pandemic is lost learning, especially in the **K–12 sector**. International higher education will have its own lost learning challenges with its current students but also with today’s K–12 students as they begin to arrive at postsecondary institutions in the near future. A researcher at Johns Hopkins University **has called for** a “tutoring Marshall plan to heal our students.” It is clear that hybrid course models will be important to address the education of these students, allowing for more flexibility in course design and hence enhancing institutional capacity to address the learning needs of an even more diverse student body.

Once the health risk has been reduced through vaccinations, the question for institutions is whether to retain these hybrid models, abandon them and return to more traditional models, or inhabit some kind of middle ground. Some may see the recent foray into hybrid learning as the future, leading to fully online higher education careers for students. Against that there is the **consistent finding** across the EDUCAUSE student studies: “Students continue to want face-to-face classes more than any other learning environment, with a majority preferring either completely or mostly face-to-face.” The opportunity for international higher education is to find the right balance point to best serve its teaching and learning mission.

The Case Method Goes Hybrid

The goal of this project was to maintain the integrity of the case-based classroom experience and case method pedagogy while also providing an equitable learning environment for in-class and remote students. Using a design-thinking approach, the project team met 80 times in 6 weeks to solidify a design that met all of the requirements. The result was a hybrid classroom in which remote students could read the chalkboards, see their fellow classmates individually, watch the professor, raise their hand, and easily participate.

A Gamified Design Framework for Flipped and Self-Regulated Learning

To support student success in blended and flipped courses, North Carolina State University created a design framework with flipped and self-regulated learning cycles based on cognitive, metacognitive, and motivational theories. This framework was applied in redesigning four large undergraduate courses in the fields of business, biochemistry, computer science, and math, which have been implemented since fall 2019 and were easily translated into “bichronous” (asynchronous + synchronous) courses during the pandemic.

Further Reading

Chronicle of Higher Education
“What I Learned in the Pandemic”

Jisc
“Over 27,000 Students Share How Colleges and Universities Could Improve Digital Learning”

Chronicle of Higher Education
“The Pandemic May Have Permanently Altered Campuses”

Learning analytics is a subset of the larger field of data analytics and has emerged from the abundance of data now available relating to the teaching and learning enterprise within higher education institutions. Through the analysis of this interrelated data, one goal is to make better, evidence-informed decisions about how best to serve an increasingly diverse population of learners in higher education settings. Learning analytics is necessarily complex, as the datasets included are often large and can come from a range of sources including the learning management system, student information system, and co-curricular data sources such as card swipes and other records of student behavior. However, analyses of course- and department-level data are more common when making decisions regarding curriculum and course planning. Higher education institutions continue to evolve internal systems in order to effectively collect, house, and utilize the data that is currently available.

Overview

Many different areas and roles within institutions of higher education might use learning analytics. Since academic support and student success initiatives have grown over time, a range of people are involved in helping learners both in and outside the classroom. In addition to instructors, it is common for academic advisors, department chairs, offices of access or disability services, the library, and other areas of academic support to use learning analytics to better understand and interpret the needs and challenges of learner populations. This has allowed institutional responses to student needs to become more “just in time” through programs such as the commonly used early-alert systems that can tell instructors and advisors when students are not performing well on early assessments, not accessing the learning management system on a regular basis, or having low engagement or performance across a set of courses in the same term.

However, with the broad expansion of data available, concerns arise about who has access to this data and for what purposes. A 2019 report from the International Council for Open and Distance Education (ICDE) includes consideration for a range of ethical issues related to the use of learning analytics including transparency, data ownership and control, accessibility of data, validity and reliability of data, institutional responsibility and obligation to act, communications, cultural values, inclusion, consent, and student agency and responsibility. Instructor data, for example—which can show the level of an instructor’s engagement in the learning management system, the timeliness of grade postings, and other quality indicators for effective teaching—has raised concerns about how it might be used for evaluative purposes without an instructor’s explicit consent.

Learning Analytics in Practice

Connecting Libraries and Learning Analytics for Student Success

Learning analytics programs benefit from comprehensive data from diverse campus sources, and this project sought to enable libraries to contribute their data to institutional learning analytics programs. Led by Megan Oakleaf at Syracuse University, the principal product of this project was the development of a library profile for an open interoperability standard (Caliper) for library learner data. This enables libraries to control the collection and use of library data in alignment with their values, ethics, and standards, as well as library and institutional policies and practices.

Learning Analytics Master’s Program

The University of Wisconsin–Madison is empowering graduates to impact teaching, learning, and policy by harnessing educational data into dynamic analyses that will help guide decisions and improvements in education. With a focus on both quantitative and qualitative courses, the curriculum equips students with the foundational knowledge and skills necessary to successfully navigate the educational data mining landscape.

Moreover, questions of how much student data should be shared with individual learners and whether that data should be offered in comparative views for motivational purposes continue to be debated. The increasing use of learning analytics “dashboards,” such as the [My Learning Analytics dashboard from the University of Michigan](#), can offer the ability for instructors and students to view data about teaching and learning through visualizations that offer the possibility of seeing and interpreting patterns. Importantly, however, this kind of data interpretation may require more training than is offered to the typical instructor, advisor, or student who is viewing the data in order to take effective action based on what the data is reporting. The [Center for the Analytics of Learning and Teaching \(C-ALT\)](#) at Colorado State University has dedicated specific resources to the interpretation and use of learning analytics data in order to “move theory into practice” by helping instructors and students interpret learning analytics for direct applications. [One recent C-ALT project](#) focused on student study behaviors and offered a personalized visualization to each student to help them better understand their study habits and patterns.

Relevance for Teaching and Learning

It is quickly becoming apparent that higher education institutions may have more learning analytics data than they can effectively use without strategic planning and purpose. Institutions are establishing increasingly complex data governance structures to help with the challenges of more complex data infrastructure needs. Developing a “data strategy,” such as [the one proposed by Stony Brook University](#), can help bring campus stakeholders together around a common set of data purposes and a mission. The ultimate goal is to drive “[data innovation](#)” in which the users of data can interpret it and take evidence-based positive action, leading to more institutional agility, optimization, and data-informed practices.

More recently, institutions have been asking how learning analytics can be leveraged for increasing equity and access for learners. Indeed, [a recent study](#) found that while 80% of higher education respondents say they are using student data, only 40% are leveraging student data to explicitly address performance gaps. With an abundance of data now available, institutions of higher education must choose where to focus the attention on that data. The [Learning Analytics Strategy Toolkit](#) from Tyton Partners responds directly to these needs by providing strategies for implementation and self-assessment of learning analytics, with equity as a central guiding principle.

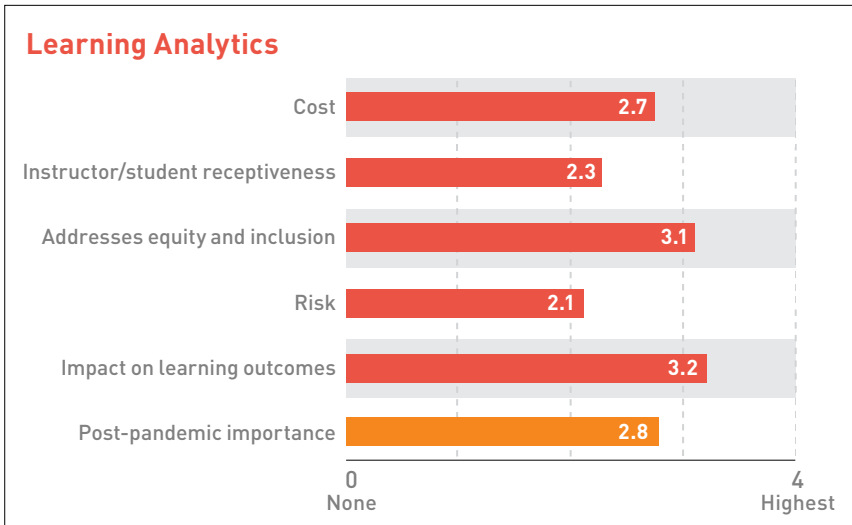
Learning analytics also has an important role to play in strategic enrollment management initiatives. With higher education [enrollments down over 10% in the last decade](#), institutions will need to think carefully about how they are supporting students throughout the enrollment, retention, and graduation path. Learning analytics data can be directly tied to retention and persistence efforts to keep students engaged, enrolled, and graduating.

My Learning Analytics (MyLA)

MyLA is the University of Michigan’s student-facing dashboard that provides students with information about their engagement with course materials, resources, assignments, and grades. MyLA has an active research agenda, centered around student development of self-regulated learning skills. MyLA draws on learner activity data stored in the [Unizin Data Platform](#). The MyLA software is now in use or being piloted at six Unizin institutions and at least one non-Unizin institution.

Nationwide Framework for Responsible Use of Study Data

The use of student data is not yet widespread in the Netherlands, partly due to the fact that students and educational institutions are struggling with ethical and privacy questions. Ten universities in the Netherlands are developing a nationwide framework to address these concerns. The framework will address the ethical and privacy questions regarding the use of student data, producing the privacy regulations and shared ethical principles that apply to the use of student data in the Netherlands.



A look at the future of learning analytics reveals a wide range of uses for data, and institutions will need to continue to evolve in their infrastructures for capturing, analyzing, and implementing data protocols in order to remain relevant and aware of best practices in this area. Institutions will also need to work carefully with vendors utilizing data and learning analytics in their products to ensure that institutional strategic goals will be met and ethical standards will be observed. Finally, it is possible that stakeholders across the institution will require additional data awareness and analysis training to ensure they are utilizing learning analytics to its full potential. This may have broader impacts for staff and faculty development as learning analytics is integrated into training and standard operating procedures for teaching and advising roles.

Student Relationship Engagement System (SRES)

Based at the University of Sydney, SRES is a learning analytics platform designed to make the large class feel small. It gives instructors the ability to tailor messages and web pages where rich data, feedback, and support can be exchanged live between students and instructors. Almost 1.8 million “personalization events” have been delivered by SRES since 2016, reaching more than 100,000 unique students. SRES is in use at four other Australian universities and is openly available.

U-Behavior

Developed at Colorado State University, U-Behavior is a teaching and learning method that instructs students to self-regulate their learning using science-of-learning strategies. The U-Behavior method is unique in that it integrates instruction (teaching students about beneficial learning strategies), provides direct feedback in the form of individualized behavior visualizations (e.g., visual-form learning analytics), and encourages ongoing reflection on behaviors.

Further Reading

Association for the Advancement of Computing in Education
 “Global Guidelines: Ethics in Learning Analytics”

Every Learner Everywhere
 Learning Analytics Strategy Toolkit

University Business
 “4 Ways Learning Analytics Lead to Equity in Higher Ed”

MICROCREDENTIALING

Microcredentials are quickly becoming a mainstay of the higher education landscape. Defined by the State University of New York (SUNY) as programs of study that “verify, validate, and attest that specific skills and/or competencies have been achieved,” microcredentials “differ from traditional degrees and certificates in that they are generally offered in shorter or more flexible timespans and tend to be more narrowly focused.” Credential Engine recently released a report showing the growth of microcredentials and alternative credentials within university settings, on massive open online course (MOOC) platforms, and via nonacademic providers. Currently, more than 700,000 microcredentials are on offer from a range of sources. The flexibility of microcredentials—which can be offered online, in person, or in hybrid models combining in-person and online instruction—may also be a contributing factor to this growing trend.

Overview

A range of options make up the field of microcredentials. In a recent report, HolonIQ defined six areas on the microcredential spectrum: (1) short courses and badges, (2) bootcamps, (3) professional certificates and licenses, (4) non–university-issued nondegree certificates, (5) university-issued nondegree certificates, and (6) degree programs or accredited programs. The spectrum also notes the time investment for each area, starting with 1–10 hours for a short course or badge, all the way up to 1,500–5,000 hours for a degree or accredited program.

As workforce needs continue to evolve due to changes in technology infrastructure and the resulting upskilling and re-skilling of the workforce, microcredentials will have a key role to play. In 2019, more than \$2.5 trillion was spent on postsecondary education and workforce training, with \$10 billion spent on microcredentialing programs. It is significant to note that the investment in this area was substantial even before the economic downturn caused by the COVID-19 pandemic, with explosive growth happening in 2020 and continuing into 2021 and beyond; current predictions state that the market will double in the next 3–5 years. The ability of microcredentials to be “bundled” in ways that create personalized and unique learning structures creates an infinite number of possibilities for professional development pathways, particularly for adult learners who are already in the workforce.

Microcredentialing in Practice

Curriculum Organization, Revision, and Evaluation (CORE) Project

The Curriculum Organization, Revision, and Evaluation (CORE) project at the University of Wisconsin–Madison seeks to provide professional development programs utilizing transformative learning experiences. Course offerings will be aligned to professional standards and competencies and offer stackable component microcredentials that create pathways into credit-bearing study.

Digital Credential Technical Standards Dissemination Initiative

The IMS Japan Society has launched a pilot project to share and reuse digital badges in admission and recurrent education among different institutions by using the curriculum standards developed by academic societies. Using IMS Global’s Open Badge Version 2 and W3C’s Verifiable Credential, Japanese universities (e.g., the Open University of Japan) and badge vendors (e.g., Open Badge Network Foundation, Japan) have initiated the issuing of digital certificates.

Relevance for Teaching and Learning

The growth of microcredentials has caused many institutions to rethink their curriculum development processes, the relationships between their credit and noncredit programs, and the ways in which they are serving an increasingly diverse audience of learners. As the microcredential landscape has matured, it has also caused significant changes in nomenclature. For example, the “credegree,” a term coined by Brandon Busted in a 2019 *Forbes* article, is “a program where a student graduates with both a traditional bachelor degree and some sort of industry-recognized skill or credential—hence the combination of credential and degree in the name.” Recently, Education Design Lab also defined the “micro-pathway,” or when “two or more stackable credentials that can be packaged as a validated market signal connecting learners to employment in high growth careers.” It is clear that traditional higher education degree models are being questioned, adjusted, and evolved to meet the changing needs of contemporary learners and the industries in which they are preparing to work.

An additional challenge for institutions of higher education is the increasing competition in the microcredential landscape from vendors and larger companies such as Google, which recently announced Career Certificates, focused on project management, data analysis, and UX design. Already, the question is being raised about how this form of microcredentialing, which can be completed for as low as \$240 through the Coursera platform, will disrupt the college degree. Google Career Certificates provide an example of the shift in focus from degrees to skills attainment and the different investments in time and finances that are required for each.

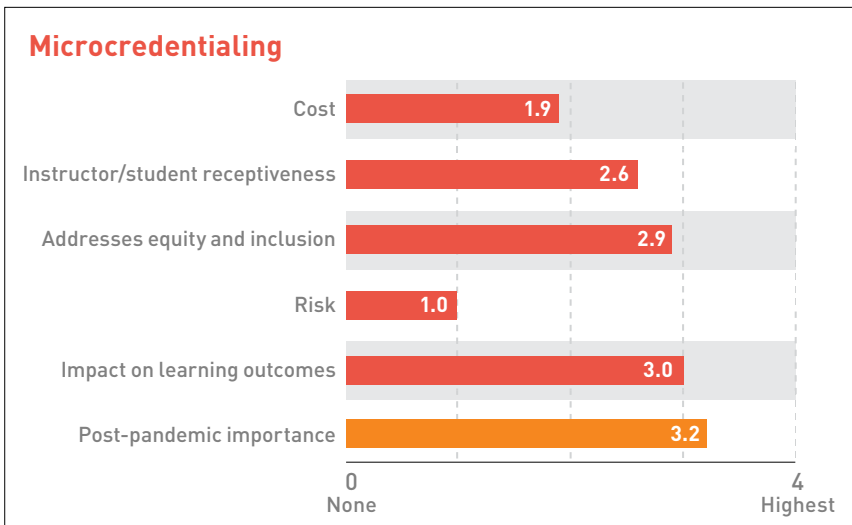
For many institutions, the growth of microcredentials will necessarily bring about a new architecture, infrastructure, and workflow for the development and implementation of programs and other forms of credentialing. The recent development of a Comprehensive Learner Record (CLR) specification by IMS Global, in partnership with a range of higher education vendors and institutional stakeholders, is one signal of the changes ahead. CLRs are “a new generation of secure and verifiable learning and employment records supporting all nature of academic and workplace recognition and achievements including courses, competencies and skills and employer-based achievements and milestones.” With a stamp of approval from the American Association of Collegiate Registrars and Admissions Officers, the CLR specification looks to become a mainstay in the higher education landscape in the coming years, with adoption already happening at institutions such as the University of Maryland University College, which served as a pilot site for the new specification.

Diversified by Design: Microcredentialing Peer Mentors and Tutors

The Learning Resource Center (LRC) at the California College of the Arts is a combined writing center and academic tutoring center, staffed almost entirely by undergraduate and graduate work-study students dispersed over two physical campuses. The institution has launched an all-online training program that uses microcredentialing to provide training for the LRC’s mentors and coaches. The credentials, designed in part by the coaches themselves, enable the LRC to tie training to specific learning outcomes while enabling the LRC coaches to demonstrate growing expertise.

The European Consortium of Innovative Universities (ECIU)

The ECIU is creating learning opportunities about urgent and relevant societal topics aligned with United Nations’ sustainable development goals (SDGs). To this end, they have created a comprehensive suite of microlearning opportunities across their many participating institutions. Over 70 micromodules support a diverse range of challenges articulated in UN Sustainable Development Goal 11—to make cities and human settlements inclusive, safe, resilient, and sustainable—and completion of each module contributes to a verified microcredential.



In addition to an evolution of institutional structure for microcredentials, there will also be a need to upskill and re-skill current higher education instructors and staff, as well as potentially to create new positions to support the evolving needs of what [Deloitte](#) recently called a “hybrid campus” model. A fundamental element of this model is the development of flexible academic programs that can be packaged and bundled to meet the needs of current and future learners who are preparing for workforce needs that may not have been defined yet. As higher education institutions map the trajectory of their response to workforce needs, it is clear that microcredentials have the potential to become a foundational element for future strategic planning.

Game-Based Courses for Core Curriculum Classes

Students can find it challenging to complete all their course requirements in a timely way. A game-based course is centered around an academic game that has been purposefully designed and developed to help students master the required content and knowledge found in a textbook. Texas A&M University has begun offering a new series of short, online, game-based courses in order to help students meet their degree requirements. The courses can be taken at any time.

Using the Comprehensive Learning Record (CLR)

The Greater Washington Partnership (GWP) connects the largest employers in the Richmond-to-Baltimore region with colleges and universities to meet the skills needed by these employers, especially with regard to technology skills. The GWP has given member institutions the right to issue digital microcredentials to students who have shown they have the knowledge, skills, and abilities associated with the different requirements. These requirements, or competencies, were developed in partnership with the institutions.

Further Reading

Deloitte

“The Hybrid Campus”



HolonIQ

Micro & Alternative Credentials. Size, Shape and Scenarios—Part 1

The EvoLLLution

“Leveraging Credential Innovation to Drive Meaningful Pathways to Degrees and Careers”

OPEN EDUCATIONAL RESOURCES

The global pandemic threw into stark relief the growing importance of open educational resources (OER)—in particular, resources that are “born digital” and that are freely available for students to access from anywhere and from any device. Unexpectedly displaced from campus, many students abandoned their physical textbooks in residence halls as courses rapidly shifted online. Some faculty struggled to find **flexible alternative materials to support this transition**.

David Wiley, founder of Lumen Learning, defines **OER** as any copyrightable work that is either in the public domain or licensed in a manner that provides everyone with free and perpetual permission to engage in the **5R activities: retain, reuse, revise, remix, and redistribute**.

Affordable textbooks and resource options are gradually gaining traction. In numerous states, student government associations have **enthusiastically promoted the adoption** of free or low-cost learning resources. Many of these efforts were already afoot well ahead of the pandemic, but it remains to be seen if the pandemic will **have any lasting impact on awareness and adoption** once students begin returning to face-to-face instruction.

Overview

The 2021 *Horizon Report* exemplar OER projects provide a vision for how far and wide the definition of “open content” now extends. Moving well beyond textbooks, many projects and resources submitted to this year’s report now include cutting-edge, openly accessible content such as **Virtual Immersive Teaching and Learning (VITaL)**, developed at San Diego State University. The rapid transition online necessitated that anatomy instructors find alternatives to using physical specimens, at which point the open virtual anatomy resources became immediately more relevant. SDSU is now developing an open platform to make these resources available to the 400,000+ students enrolled within the California State University System.

The University of British Columbia Emerging Media Lab developed **3D Metabolism**, which provides data visualization of the metabolic network. Developers hope that this open-source platform will be adapted by other institutions and find broader utility in learning environments ranging from high schools to medical school training.

Boston University’s Learning Blocks (BULB) is an open-source WordPress plugin that aids the creation of interactive OER. Instructors embed self-assessment questions directly into pages alongside text, audio, and video content. Students interact directly with questions in their browsers and receive instant feedback while working through lessons.

OER in Practice

Australian Politics and Policy Open Textbook

This customizable, open textbook provides holistic coverage of Australian politics and public policy for use in undergraduate and postgraduate courses. Close to 110 scholars have been involved in the project, including 70 university-based and independent scholars from across Australia. The textbook is hosted on **Sydney Open Library**.

ENCORE+ — European Network for Catalyzing Open Resources in Education

This project seeks to promote the adoption of OER in Europe by building a European OER ecosystem. Components of that ecosystem include a sustainable collaboration model, an OER quality framework (which includes a pilot program), and OER strategy guidelines for higher education and business.

The University of Calgary's **Endlessly Replayable Patient Cards** are clinical problem scenarios that allow medical learners to practice diagnosis, investigation, and management. The cards are authored by clinical faculty and structured around key findings in cognitive psychology. The case templates contain variables allowing for replay, offering learners unlimited practice structured around the **Lietner Study Method**.

The **Tapestry Tool** at the University of British Columbia was developed with input from more than 1,000 students, staff, and faculty. The tool is designed to allow users to integrate concepts presented in any of several mediums. Concepts are displayed as nodes that support videos, photos, documents, websites, and even interactive widgets.

The College of the Canyons **Zero Textbook Cost Initiative** empowers students to act as OER Student Specialists who work alongside instructional designers, technologists, faculty, and librarians to develop materials. Student Specialists work to remove the faculty barriers to adopting or adapting content and assist in the redesign of materials from a student perspective.

Finally, the **University of North Carolina System Course Enhancement and OER Collections** provides a curated repository of high-demand course resources and materials that are offered across the UNC System. The university enlisted more than 70 subject-matter experts who worked in discipline-specific teams to design and develop content.

Various data suggest that on average, **students spend roughly \$600 per year on textbooks**. Cost savings aside, the improvements in retention and student outcomes resulting from these efforts can be significant. The adoption of OER amid the pandemic has led to **increased unit enrollment and increased credit hour production**. While the results of the quasi-experimental study are limited, there appear to be statistically significant results that support these outcomes.

Open Education at the University of Edinburgh

The university's strategic support for OER enabled it to rapidly develop and offer an open course for clinical staff supporting COVID-19 critical care patients. Supported by the university's Wikimedian in Residence, staff and students have created hundreds of Wikipedia entries that redress gender imbalance, center marginalized voices, diversify and decolonize the curriculum, and uncover hidden histories.

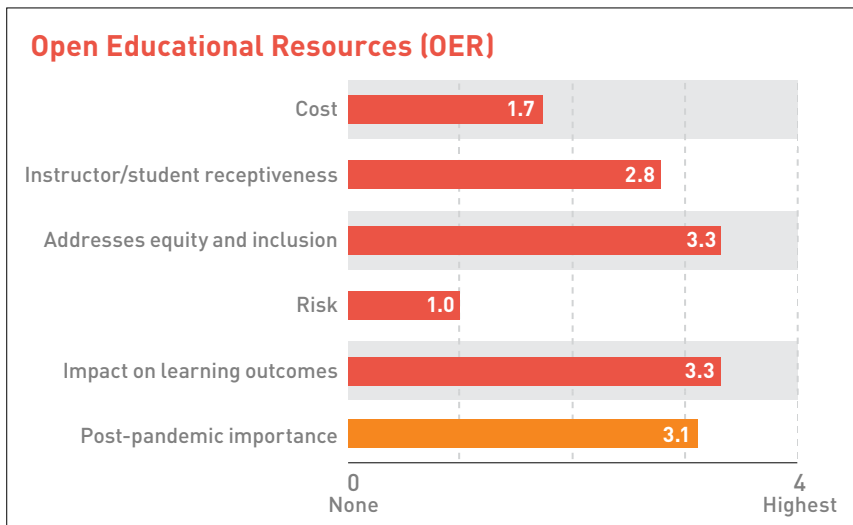
Open Education Austria Advanced

This collaboration of Austrian higher education institutions seeks to define and implement an overall concept for the sustainable anchoring of OER and open educational practices at Austrian universities. Aspects of the program include a national OER certification body, services for instructors developing OER, and an expansion of technical infrastructure for OER.

The Affordable Learning Exchange (ALX)

This is an effort to widen the use of OER across all six of the Ohio State campuses. The initiative provides services including support for adopting, adapting, and creating OER. Frequently, support for course redesign and pedagogical transformation to support student learning is available as well. To date, the program has funded 114 projects in 5 years and produced more than 200 open books.

Relevance for Teaching and Learning



One of the most relevant advantages of OER is **increased societal equity** for students. Many students do not have equitable access to learning resources, primarily because of the cost, which disproportionately affects marginalized students, who are more likely to bear the expenses of their education on their own. OER also helps keep content current because it is often hosted online, where it can be updated quickly. OER can also empower instructors and students by promoting learning experiences that are specifically aligned to curriculum standards. Students can contribute by developing their own resources independently or in **collaboration with their instructor**. Finally, OER saves money. Commercialized OER resources, in contrast, are sometimes rebranded with additional fees—these are often referred to as **openwrapped and openwashed** content.

Despite the urgency of the pandemic, however, adoption rates among faculty remain flat. **Digital Texts in the Time of COVID** found that 70% of faculty still retained textbooks as a course requirement and 87% reported using the same textbooks as previous terms. In fact, the level of adoption of OER as a required course material did not increase in 2020, marking the first time that growth in awareness was not coupled with growth in adoption. Much of the reason for this lethargic adoption is predicated on the surge in commercial vendor options, such as **inclusive access**, which provide faculty the same imprints in alternative, lower-priced formats.

The Code of Best Practices in Fair Use for Open Educational Resources

This code is a tool for educators, librarians, and authors to evaluate common professional scenarios in which fair use can enable them to incorporate inserts, including those protected by copyright, to create OER. Supported by the American University Washington College of Law, it is the product of a cross-section of OER professionals and has been reviewed by seven leading legal experts across Canada and the United States.

Further Reading

EDUCAUSE

Open Educational Resources (OER)

US Department of Education

Open Education

UNESCO Institute

Guidance on Open Educational Practices during COVID-19 Pandemic

QUALITY ONLINE LEARNING

The number of exemplar projects submitted for the 2021 *Horizon Report* in the category of quality online learning is both impressive and extensive. This category did not exist in last year's report yet garnered 63 outstanding submissions. Most of this activity was attributable to the pandemic, which resulted in many instructional service units being marshaled in new and important ways as courses rapidly pivoted online. However, the mechanics of delivery—that is, how to use the tools—was only part of the challenge. More importantly, strategies for how to effectively teach online and how to design quality courses were often promoted. To meet this challenge, colleges and universities brought to bear a variety of strategies, including templates, self-directed courses, consultation, resource hubs, and more.

A side effect of this shift was demotivation, frustration, and stress among the staff, the faculty, and even the students. While the exemplars are wonderful examples of creativity and enterprising ingenuity, there was a human toll as well. It proved difficult to suddenly on-ramp thousands of faculty overnight.

Overview

Early in the crisis several institutions began developing portals/hubs that included a variety of resources and teaching strategies. These were normally selections of finely curated materials intended to help faculty make the rapid pivot from traditional to online instruction. Among the finest examples of these was Indiana University's faculty-facing **Keep Teaching** and its companion student-facing **Keep Learning**. Staff proactively developed the resources of the site, allowing them to quickly revise and redeploy it to meet the needs of faculty. The site's structure and content were borrowed by dozens of colleges and universities across the US and abroad.

The pandemic required new pedagogical approaches for faculty to rethink content delivery, engagement activities, and authentic application and assessment. An outcome for Western Sydney University was the **Online Engagement and Teaching Hub**, which provided faculty and designers with a curated suite of teaching strategies, recommended technologies aligned to evidence-based learning theories, and exemplars showcasing practices of peers in the university. Regardless of where an instructor was in the online continuum, the hub provided practical resources, the opportunity to connect with a community of practitioners, and a mechanism to enhance the scholarship of their teaching practice.

Quality Online Learning in Practice

Bloom Restaurant Orientation Digital Learning Simulation

With the pandemic, the culinary education team at the Conestoga College Institute of Technology and Advanced Learning faced the challenge of providing a meaningful learning experience at a distance. Their answer was a 13-module simulation, enabling students to experience a virtual orientation to a restaurant's kitchen. The animation and design were done entirely by Conestoga students. Initially designed to help pivot online, this simulation will be part of their culinary arts program going forward.

Community Building Resources from Equity Unbound and OneHE

This is a set of community-building resources for online teaching, launched in August 2020 in order to support people teaching fully online for the first time. It includes written instructions and usually also video demos of activities to do in synchronous or asynchronous classes, for introductions, warm-ups, or ongoing community building. It includes adaptations, templates, and other supporting information. OneHE is an international collaboration of learning designers and other education experts.

Conestoga College in Ontario created a series of virtualized culinary lessons and learning experiences called **Bloom** that replicate a real culinary school. With guidance from the Virtual and Augmented Reality Lab specialists, a 13-module digital learning simulation was developed to provide culinary students with a virtual orientation to the Bloom restaurant. Students interactively explore various stations and equipment in the kitchen, establish safety procedures, and further their learning to become a productive and skilled kitchen team member.

Auburn University created several high-quality simulated exhibits and labs to support the shift. The **Evolution Exhibit**, **Art Gallery**, **Lab Assessment**, **Microscope and Slide Viewer**, and **Exhibit Hall** are extraordinary examples of resources that were developed to support teaching and learning. Analogues to the on-ground versions, these simulations are designed to be as realistic and intuitive an experience as possible. Moreover, instructors can record annotated videos, allowing them to walk students through the content just as they would in a face-to-face setting.

The e-teaching organization Hochschulforum Digitalisierung and the Gesellschaft für Medien in der Wissenschaft, Germany, created the **Quickstarter Online-Lehre**, a course to support and qualify lecturers with little or no experience in the use of digital media. The qualification consists of seven units that provide lecturers with an introduction and basic competencies for digitally supported teaching and learning. The second component focuses on lessons learned and the exchange of experiences. The recordings and accompanying materials are available as OER.

Finally, Bowdoin College's **Bowdoin Online Learning and Teaching (BOLT)** was developed in response to the pivot from emergency instruction to an intentional, well-designed online instructional program. Communication consisted of askBOLT email to request support, a Teams Channel for faculty-to-faculty communication, and a website and workshop calendar. BOLT services included faculty consultations and weekly instructional design sessions, among other solutions.

Many faculty discovered that teaching online meant more than simply replicating the face-to-face experience through Zoom. Institutions that **coupled that shift to remote instruction with quality standards** appeared to **yield higher student satisfaction** than those that did not. Quality Matters, a leading quality assurance organization, **pooled a series of resources** that noted the importance of designing courses using empirically validated quality assurance standards that improve the online learning experience. Quality Matters, OLC, and other similar standards ensure that faculty are prepared to teach online and that their courses meet certain quality assurances.

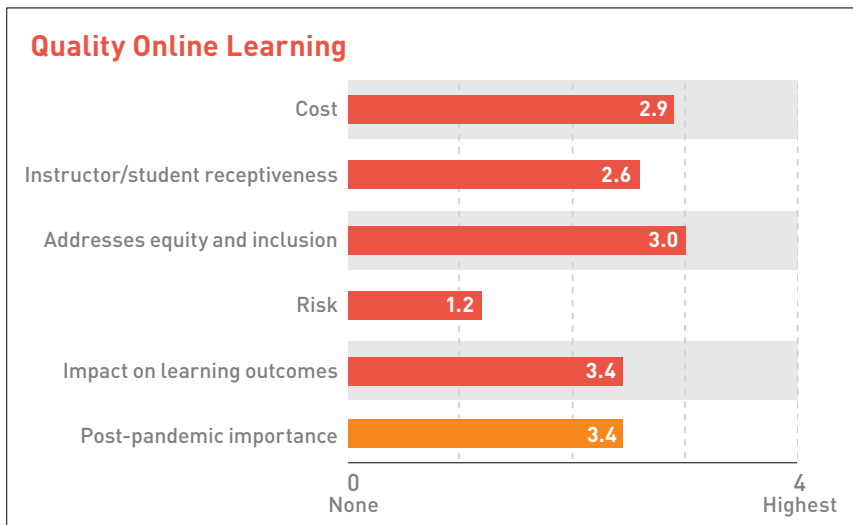
Hiking with Canvas: Virtual Summer Training Sessions for Faculty during Shelter-in-Place

Due to COVID-19 and the need to rapidly train faculty for teaching in a remote environment using the Canvas LMS, Chapman University designed three types of summer intensive course design training sessions, called "hikes," to deepen instructors' understanding of how educational technologies could support their online teaching and provide a rich student-learning experience. Feedback was enthusiastic about the usefulness of these trainings, which are publicly shared and can be repurposed by other campuses.

Self-Service Resources for Course Design and Accessibility

To promote quality online teaching and learning, the University of Florida's Center for Instructional Technology & Training designed a set of self-service resources, intended for faculty and advisors, to provide guidance in course design, digital accessibility, online advising, and edtech implementation. Faculty can review a number of modules and course templates, which include consideration for learner paths and prompt faculty to provide information to create a welcoming and inclusive online course.

Relevance for Teaching and Learning



The term “quality” as it relates to digital teaching and learning is one that often spurs fervent debate, given that definitions vary so widely. While several books and articles have been authored on the topic, [Tony Bates](#) observes that it is “the relationship between quality assurance processes and learning outcomes, and ‘quality assurance fit for purpose’: meeting the goals of education in a digital age.” The recent pandemic served as something of an inflection point for what quality entails as institutions grappled with the conversion of thousands of courses from traditional to digital formats in a very compressed time frame. Emergency online instruction was often conflated with quality online digital learning, which is far more deliberate, purposeful, and well conceived. As a result, [several institutions have renewed their focus](#) on quality assurance and have begun a more deliberate transformational process that ensures the instructional content is student centered, aligned with programmatic learning outcomes, accessible to all learners, and effectively designed and delivered.

Technology Enhanced and Innovative Teaching and Learning with Technology

In response to a nationwide lockdown necessitated by the pandemic, the Faculty of Economic and Management Sciences (F-EMS) at North-West University in New Zealand conducted a survey of students and staff to learn about the experience of the shift to remote teaching and learning. The survey enabled F-EMS to construct a set of important competencies and implement a set of intervention strategies.

Virtual Exhibit Hall

Auburn University’s Virtual Exhibit Hall is a simulated space in which students and professors can learn and interact with academic content and with one another. Presenters can upload either audio or video explanations for the work being displayed, and there is the option to include a synchronous Zoom session for presenters and visitors to interact in real time. After the virtual exhibit hall experience, students will feel more comfortable in a live academic poster hall because they will know what to expect, both as a presenter and as an audience member.

Further Reading

EDUCAUSE

“5 Tips for Moving from Remote Instruction to Quality Online Learning”

The EvoLLLution

“Remote in a Time of Pandemic: Six Considerations As We Adapt to COVID-19”

IEEE Spectrum

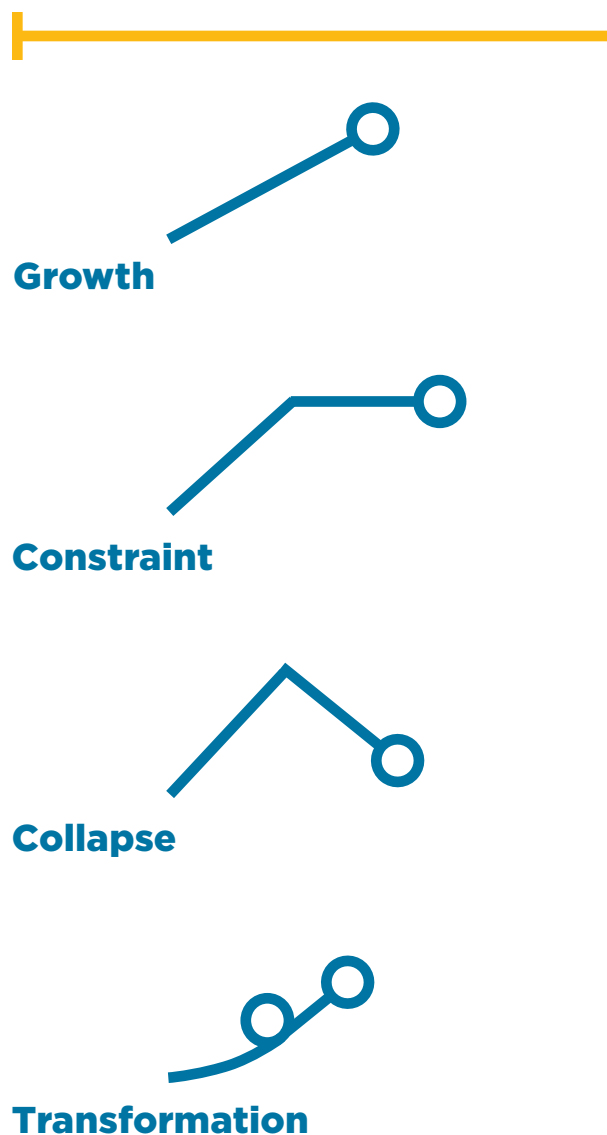
“How Online Learning Kept Higher Ed Open during the Coronavirus Crisis”

Since the release of the previous *Horizon Report*, the trauma of a global pandemic has fundamentally changed the way in which higher education functions. The impact of an emergency move to remote work, teaching, and learning, followed by an academic year of mostly online or hybrid education, continues to be felt. And the implications of these events will continue to shape higher education for years to come. Despite the constraints of events, trends, and technological developments that are beyond their control, higher education leaders still have the capacity to exert agency over the future of their institutions. While the three broad options of **restoring what was**, **embracing a post-pandemic evolution**, and **initiating a comprehensive transformation** can provide strategic direction, the futures of higher education (and individual institutions) are dependent on decisions made today and on a host of factors beyond their control.

Clearly, plans that enable us to navigate diverse futures are more robust than plans that are cemented to a single version of the future. In this section we are using a tool from the Institute for the Future: envisioning alternative futures. By doing so, we can be more imaginative in our planning and equip ourselves with the flexibility we need to encounter what does eventually occur. This section of the *Horizon Report* is a creative but systematic exercise in anticipating alternative futures for higher education.

We provide four such scenarios. Each is written from an imaginary viewpoint in the year 2031, reflecting on the course of higher education through the decade beginning in 2021. We are using the institute's four scenario archetypes or generic shapes of change. The first is growth, a scenario that takes current trajectories into a future in which higher education largely flourishes but leaves some of its issues inadequately addressed. The second is constraint, in which higher education continues but with a diminished role. Third is collapse, a scenario in which higher education is beset by rapid breakdowns and forces of change outside its control. Finally, in the transformation scenario, higher education establishes a successful new paradigm for itself.

We have taken this “all four points of the compass” approach to provide distinct future alternatives. These archetypal scenarios will enable you to anticipate a variety of possible futures in your planning for what might come our way.



Ten years after vaccinations brought COVID-19 under control, the long-term impacts of the pandemic are coming into focus. As online courses became accepted and monetized, the appetite for them grew, enabling the emergency shifts to remote work and learning to become a permanent part of an evolved landscape. Faculty development programs designed to facilitate transitions from face-to-face to online learning converted many faculty previously skeptical of online and hybrid learning into believers. Generational replacement hastened this trend as Boomers retired and Millennials and Gen Zers came to dominate the ranks of faculty and make tenure decisions.

Increased enthusiasm for online and hybrid learning models meant instructors were able to offer better learning experiences to students, which increased demand for courses with flexible schedules and blended learning environments. Soon the demand for programs to help instructors learn how to leverage learning technologies and cultivate richer learning experiences outpaced the supply of instructional designers and academic technologists. Most institutions opted to convert faculty development programs into self-service online modules that embody the best practices and designs of online and hybrid instruction. Some institutions staked a claim in this space by building revenue-generating online programs that cater to institutions lacking the resources to create or support their own programs at scale. The experiences for faculty in these programs deepened instructors' commitments to imparting the same experiences to their students, regardless of the formats in which their courses are delivered.

Rather than increasing the number of full-time tenure-track faculty, large public institutions doubled-down on the short-term financial benefits of relying on lower-paid part-time and adjunct faculty who could deliver the largely modular courses needed to meet enrollment requirements. The number of instructional design and academic technologist staff grew modestly at first in order to build programs to support a model of online education that operated in parallel with the face-to-face offerings to generate revenue. Institutions are still unable to guarantee students access to the devices and the internet access necessary to handle the demands of their coursework, to provide high-quality open educational resources to reduce the overall cost of a degree, and to ensure all students receive timely and comprehensive accommodations to their accessibility needs.

Institutions have not departed significantly from the tuition-driven funding models that dominated the pre-pandemic landscape. In the face of growing xenophobia and nationalism, international student enrollments declined precipitously as many students feared for their safety; higher education responded by expanding their revenue streams through increases in offerings beyond traditional two-year, four-year, and graduate/professional degrees to include a vast array of microcredential programs with inflated tuition and fees designed to make up for lost revenues. Doing this increased the number and type of students from around the world who can "return" without traveling abroad and created opportunities for lifelong learners of all ages and backgrounds to return to their studies whenever and for however long they choose. Although international enrollments increased significantly under this new model, the revenue gains were not sufficient to fully offset tuition hikes. Nevertheless, the rate of tuition increases continued to decline over the course of the decade.

The effects of global climate change have added to the permanence of the move to online and hybrid teaching models. Severe weather events and unpredictable weather conditions have reduced the capacity of some institutions to rethink their course delivery models. Offering more online and hybrid options also allowed institutions to discover cost savings by not having to meet students' housing and other physical needs. Some institutions developed sustainable forms of energy production, campus recycling and composting efforts, and green infrastructural development. Still others leveraged existing resources, including faculty expertise, to develop new research and academic programs, curricula, and credentials with a mission to mitigate the effects of climate change. These programs enroll students from all over the world in numbers that easily surpass the most popular traditional majors. Institutions have leveraged the experiences and lessons learned from the pandemic to make high-quality higher education an exportable commodity.

Higher education emerged from the COVID-19 pandemic diminished. Large segments of prospective students migrated away from conventional institutions toward other opportunities for skills training and job placement, and college enrollments plummeted to historically low levels. This widespread financial strain tore a fault line through the foundations of higher education. The scarcity of students resulted in a bifurcation of higher education in which some institutions became more entrenched in traditional models of education for narrow populations of students while other institutions leaned into innovations and new education models that enabled efficiency and renewed commitments to equity.

For some institutions, the threat of closure drove them to seek stability by sustaining traditional models of postsecondary education, cornering the market on prestige and status. At these institutions, innovations in learning technology and design are regarded as threats to the core values and historical foundations of higher education and are perceived as “cheapening” degree attainment. Degree programs at these institutions tip toward those with perceived direct applications to industry, workforce, and socioeconomic status—business, science, law, medicine, computer science, and economics. Student demographics mirror markers of status and wealth in society at large, with enrollments disproportionately favoring white and upper-class student populations. These institutions strengthened their commitments to demonstrating value and ROI to their government and industry partners and investors, and they gain stability through robust and exclusive advancement and alumni programs and engagement.

Indeed, for these less progressive institutions, “doing more with less” means doing more for a select few and doing less for most others. Outdated and biased algorithms for “success” drive the distribution of student and financial resources, leaving little support for student populations without the financial, social, and/or digital capital required to gain entry into meaningful learning experiences and successes. Without the benefits of innovative learning technologies and course and program design, the stresses and burdens of this form of learning disproportionately impact nontraditional students, as these institutions fail to adequately understand and adapt to the domestic, professional, and economic demands these students encounter along their educational journey. The digital divide persists and in some places even widens as the onus of securing access to reliable devices and networks falls on the shoulders of students, with only minimal levels of support from their institutions.

Other, more progressive institutions were open to adapting and finding ways to operate more deliberately and efficiently and to offer education to larger numbers of students who have been closed off from traditional models of education. These institutions saw the financial crisis as a call to winnow and strengthen their commitment to a different set of core values, to the betterment of their communities and environments, and to sustainability, diversity, equity, and inclusion.

These institutions embraced alternative and innovative models for development and recruitment, as well as flexible, hybrid approaches to learning and degree attainment. Where they lost financial security that may have been gained through exclusive advancement and recruitment efforts, they stabilized through new eco-entrepreneurial investments, international collaborations, and social activism, fundraising, and capital. Enrollments at these institutions came to balance across student populations and demographics, and their carbon footprints set a new standard for “green education.” Nontraditional students navigating domestic or professional demands are granted flexible arrangements for their learning experiences and degree completion. Aggressive budget restructurings provide complete overhauls of institutions’ device loaner programs and network infrastructures, with the goal of providing “all students all access all the time.” Online education programs at these institutions grew exponentially, with the stated purpose of providing more access to education for more student populations.

For these institutions, “doing more with less” means serving more students more effectively through fewer resources. They embrace efficiencies in course delivery and operations and explore innovations where they enable access to education for nontraditional students and institutional access to nontraditional sources of support and stability. Curriculum and degree programs at these institutions mirror their more relational and personal approaches to education, preserving and elevating the value of humanities and liberal arts education, taking holistic approaches to supporting the whole student.

The confluence of three major trends spelled the end of higher education as we knew it. First, the triumph of neoliberal economics over Keynesian models stripped the state of tools to respond to astronomical rates of unemployment and inflation, resulting in the collapse of the middle class and the last remnants of the modern welfare state. Second, without the will and capacity to help the victims of the environmental, infrastructural, and economic devastation brought about by climate change, concerns about physical and economic security began to take precedent over higher-order values of autonomy and self-expression. Finally, taking advantage of the economic and environmental turmoil, nationalists employed political violence and threats of political violence to undermine the liberal democratic order, advancing apartheid policies that created separate and unequal conditions.

Not only has state funding for public higher education institutions been all but eliminated, federal student aid programs have been replaced by aggressive voucher programs, resulting in a postsecondary version of charter schools in which small, private, nonprofit institutions organized around narrow political, economic, and religious belief systems thrive. Institutions that had become dependent on tuition-based operating budgets were unable to survive the sharp drop in student enrollment. Large state systems that survived shuttered many branch campuses and consolidated their resources with the flagship institutions. Only community colleges experienced any semblance of stability—they focused on providing affordable education to all, targeting local populations, and developing programs in partnership with local employers to develop high-demand skills.

The scope of academic research narrowed considerably. It now relies heavily on corporate funding and is not allowed to deviate significantly from the political and economic agendas of strident political parties' platforms that dominate legislatures around the world. Declines in work-related travel due to both funding and climate considerations have eroded the sense of community among academics, who no longer attend large disciplinary conferences in person to share ideas and to collaborate on research but instead hold online events organized around highly esoteric or commercially profitable topics. The effects on teaching and learning are only just now beginning to be felt.

A lack of sociopolitical interest in producing high-quality research means that many faculty are being replaced with individuals lacking in expertise but who are able and willing to leverage learning technologies to teach the largest number

of courses and students as possible in the shortest amount of time. The importance placed on the value of efficiency means most students are receiving low-quality online instruction from un(der)qualified instructors with little or no faculty development or training in how to use instructional technologies; in some instances, institutions automate the instruction, relying on learning analytics and artificial intelligence to manage the student experience, conduct algorithmic assessments of learning, and surveil student behavior and environs with proctoring software.

The slouch of remote instruction to mediocrity has, in part, been exacerbated by the fact that most students cannot afford the devices and internet speeds needed to enroll in high-quality hybrid and online courses. The digital divide between the haves and have nots has increased with the collapse of the economy and the decay of the infrastructure required to support digital learning.

For many faculty, staff, and students, mental health issues brought on by the COVID-19 pandemic have worsened in the decade following. The confluence of social, economic, and political turmoil of the past few years have left many feeling vulnerable and lacking the ability to dedicate themselves fully to the work of teaching and learning. With students beset by fears of violence by fascist elements, concerns about severe weather events and environmental destruction, and anxiety about the future, most institutions have experienced lower graduation rates, longer time to degree, and uneven retention. Moreover, higher education institutions struggle to provide students with mental health support as funds for “nonessential” services have largely dried up.



The migration to remote and online learning during the COVID-19 pandemic had lasting effects on students', institutions', and society's perceptions of higher education. Through the adoption of new learning technologies and hybrid learning models, it became widely accepted that anyone can and should be able to learn from anywhere. In our global cultural imagination, images of students sitting on the grassy lawns of in-person campuses were replaced by images of the “anyone anywhere” student—a single mother preparing school lunches for her kids, a first-generation student waiting for a bus after work—logging in to class from a laptop, tablet, or phone. With education increasingly available through new technologies and flexible models, issues of educational access among lower-income students were largely mitigated. Cultural acceptance of the right to an education for all people led to a groundswell of support for college debt forgiveness and free-tuition programs around the world.

Free education for “anyone anywhere” is subsidized through a number of means. Large portions of public funding are allocated for postsecondary tuition and technology support. Some industries in need of expanded labor pools or strengthened workforce pipelines established formal partnerships with institutions to provide needed skills training and certification programs, while other industries have invested in modular tuition packages for students, transferable between institutions offering specified courses or programs. Institutions with significant endowments have invested in costly learning technology and course model innovations that enable them to attract large pools of remote and/or hybrid students, and many of these innovations have been shared with the larger higher ed community. Smaller and under-resourced institutions have explored additional solutions such as cross-institution consortia, adoption of OER, and grant funding in order to stabilize. For-profit education largely ceased to be a viable model for most institutions, aside from those offering niche programs, credentials, or learning experiences not recognized or supported within the normal tuition-funding channels.

It's a time of renewed interest and advancements in improving student mental health. Students are freer now than they've ever been to pursue studies based on their passions or aspirations, with cost of tuition and other barriers to access no longer a point of consideration. Pandemic experiences renewed institutions' focus on students' personal lives and needs, leading to widespread adoption of more humanized and relational forms of learning design. On the whole, students are better positioned to “fit” their education within the space of their personal lives and needs, eliminating traditional sources of student worry and stress. “Learn whenever you can, however you can” becomes institutions' mantra for course and degree completion and new “lifelong learning” programs, and most students' learning journeys are more winding than they are linear.

The industry of learning technology has blossomed into one characterized by big tech investments and headline-grabbing innovations. Advancements in areas such as AI and XR technology have rendered the postsecondary landscape nearly unrecognizable from its traditional roots. Bias-laden AI models have been replaced by more equitable models, and functions traditionally served by human faculty—grading, instruction, and even social interaction and advising—have been automated to varying degrees across institutions with varying levels of technological capability. Virtual environments for learning and research offer more imaginative and immersive experiences for students and instructors alike. Class sessions can take place on the surface of Jupiter, for example, or inside the human digestive system, or in the streets of 18th-century Paris. At some institutions, faculty and administrators are far more likely to interact with a student's avatar than face-to-face with that student.

Globally, the percentage of adults with a four-year college education has ballooned, contributing to unprecedented economic expansion and community growth in historically underdeveloped regions around the world. Postbaccalaureate degree attainment—master's degrees in particular—rises as well. An expansion of workforce segments with graduate-level degrees contributes to a heightened awareness of the inequities in access to higher-status, higher-paying sectors and levels of the workforce. Significant collectives of institutions around the world commit to combating these inequities and launching initiatives focused on supporting graduate program completion and higher-status job placements for women and racial/ethnic minorities.

IMPLICATIONS: WHAT DO WE DO NOW?

With the 2020 *Horizon Report*, we initiated a new feature that has come to be known as implications essays. By doing so, the *Horizon Report* presents a unique opportunity to compare the issues across global higher education.

For 2021, we solicited five implications essays from our panelists. They focus on Australia (Mason), South Africa (Czerniewicz), Turkey (Bozkurt), and two segments of US higher education—associate’s colleges (Crawford) and doctoral institutions (Mondelli). Research results, quite obviously, have little value by themselves; their value lies in being the basis for future plans and their implementation. The title of this section of the *Horizon Report* says it all: Given the 2021 results, what should we do? What plans should we make? We asked these panelists to consider the results of the work of the 2021 panel and to map these results, together with their own deep expertise, onto a specific institutional context, either by nationality or institutional type.

Indeed, what is striking after a careful read of these essays is the degree of similarity across higher education. As you read these brief essays, you may find yourself remarking, “Those are my issues too.” Issues such as collaboration and flexibility, addressing the inequalities glaringly exposed by the pandemic, open learning ecologies and new pedagogical blends, and the ever-present issue of funding are ones that cross national boundaries and bridge institutional types. At a time in which there is so much division, these essays can serve to remind us how much we, in higher education, have in common.

These essays bring forward important ideas for the support of the two primary constituencies for teaching and learning professionals: faculty and students. These ideas boil down to competencies and flexibility. Due to lost learning and other challenges that all students have faced, faculty will need a wider range of competencies and students will need as much flexibility as their institutions can provide.

If the pandemic has done one thing it has brought into relief how interconnected we are globally. The *Horizon Report*, in light of the new methodology adopted last year, eschews the role of prophet and instead seeks to be a resource that sparks and catalyzes planning and forward thinking. These essays can remind us that such planning need not happen in isolation, that the larger higher education community can build on the experience of neighbors and colleagues.

Australian Higher Education

South African Higher Education

Turkish Higher Education

US Community Colleges

US Public Doctoral Institutions

AUSTRALIAN HIGHER EDUCATION

Jon Mason, Senior Lecturer in Education, Charles Darwin University

Like technology adoption, “rethinking” has been a common feature of change in Australian higher education ever since Diana Laurillard’s seminal work *Rethinking University Teaching* was published in 1993. Since then, recognition of the role of teaching (especially with digital technologies) has only increased. The context of change has been turbulent, exposing numerous stresses in the higher education sector triggered by corporatization and diminishing public sector funding, highlighting issues including free speech, academic autonomy, and casualization of the workforce (temporary or sessional contracts). During the pandemic, new political tensions have emerged concerning the financial reliance on the international student market, fear of international interference in our systems of governance, and public funding for research. The scale of disruption caused by the pandemic masks the accelerated digital disruption that had become all so normal. It has also been a catalyst for government to challenge **big tech social media business models**. Rethinking is now wider in scope as the sector recovers from the economic impact with an imperative to recalibrate and position for renewal. With consistently high world rankings and a reputation for digital adoption, the 43 Australian universities send a strong signal of quality education and “new world” opportunity aligned with contemporary needs. So, how might they respond to findings in the *Horizon Report*?

Although the technologies identified in the *Horizon Report* are all expected, given the exposure of such themes in the media, the background context of the pandemic should not be underestimated. Current reports indicate that 2021 saw a 99% decrease in international student numbers. So, might the next era of online education shift the balance between offshore and onshore offerings? Agile institutions may already have a strategy in place. It is also the case that most institutions already make competitive use of the digital environment and are guided by a regulatory environment focused on quality, so additional attention on the quality of online teaching is to be expected.

Arguably, the technologies to closely watch are artificial intelligence, microcredentials, and the next generation of learning analytics.

The scale of disruption caused by the pandemic masks the accelerated digital disruption that had become all so normal.

Artificial intelligence brings new opportunities and challenges, though it is not new, nor are the “looming futures” associated with it. What’s new is the widespread attention now present across many industry sectors. While innovations look to deliver new efficiencies and business models, the opaque nature of AI extends the “black box” problem of algorithms already underpinning mainstream internet services. The bottom line will be about attention to ethics and institutional accountability. Key questions concerning privacy, ethics, bias, and equity all need addressing, and there’s a case for “ethics by design,” similar to the recent prominence of “privacy by design.” The CSIRO *Artificial Intelligence Roadmap* provides such ethical guidelines. For educators on the front line, the implications of AI impact the social nature of learning where development of new literacies will be required. There is a strong case for an observatory to be established that interfaces with the regulatory authorities.

Microcredentials are also not new—digital badges are a decade old. Perhaps what is now emerging is a democratized ecosystem of credentialing in which both employers and industry are increasingly becoming producers of credentials rather than just consumers. This represents a new competitive domain for colleges and universities, much more so than MOOCs have been. From the perspective of the learner (that all-important market entity), microcredentials are all about self-directed, customized, career-relevant learning, with an inherent shift of focus on achievable milestones in the shorter term rather than reliance on capstone credentials. Currently, the latter still matter, and higher education institutions are creating models in which many microcredentials will have a second purpose as stackable parts of a larger qualification, though this may not adequately respond to diminishing employer/student confidence in qualifications as a pathway to employment. In this context, microcredentials provide an innovative design pathway to keeping course offerings contemporary. This technology also offers opportunities for institutions to streamline recognition of prior learning (RPL) and work integrated learning (WIL) protocols. A recent review of the Australian Qualifications Framework already provides guidelines for credit recognition in this space.

Learning analytics has rapidly matured and is poised for a next generation. It now makes more sense to talk about the broader ecosystem of data analytics informing all practices in higher education. Responding to this is the industry-led **Measurementality** initiative of the IEEE Standards Association focused on “what counts in the algorithmic age.” Connecting both artificial intelligence and learning analytics is the underlying proliferation of data and questions concerning its origins and destinations. Privacy laws concerning data protection have had a significant impact in recent years and highlight the growing role of data literacy and data governance. In terms of informed consent, fault lines are already stark in the systems and protocols supporting research and teaching. The ubiquity of data, what qualifies as open data, and what qualifies as proprietary data should be a primary concern in ongoing development of learning analytics that might be designed to enrich student learning as much as inform educators.

The bottom line for Australian higher education should be all about a renewal mindset. Digital transformation continues, but a pandemic has intervened. Responding to the technologies and trends while recalibrating systems for optimizing opportunity encapsulates the moment. An example includes realizing it is employers who ultimately determine the continuous journey of employability, not colleges and universities.

Author Bio

Jon Mason is a senior lecturer in education at Charles Darwin University, Australia, where he pursues interdisciplinary research focused on human engagement with and within digital environments. Sensemaking and the role of question development in learning are also key interests. Prior to embarking on an academic career in the past decade, he worked at the nexus of government services, knowledge management, and education while engaging in international standardization for over two decades.

SOUTH AFRICAN HIGHER EDUCATION

Laura Czerniewicz, Professor, University of Cape Town

Along with climate change, inequality is the scourge of our era. As one of the most unequal countries in the world, South Africa provides an exemplar of how higher education reflects and responds to this social pandemic.

South Africa has 26 public universities, which enroll most of the student population, as well as more than 100 (and growing) private universities, which enroll about 15% of the country's university students. Of the more than one million students, about a third are distance education students, largely at the sole distance education university. The post-apartheid dispensation has made strides in addressing past inequalities—through policies, funding levers, and mergers—and the demographics of the student population have now changed. Nevertheless, inequities continue: on numerous measures, white students reap more benefits in and from higher education than do black students.

Funding has been a critical issue; state funding has been repeatedly cut (dramatically in 2021), while student debt is large and growing. Although the poorest students receive support through NSFAS (National Student Financial Aid Scheme), financial challenges have been severe for the “missing middle,” those who can neither afford to pay nor access state support. Students have responded through regular protests, fueled by a promise (which economists have deemed impossible) from the previous president for free education.

The COVID-19 pandemic exposed less visible inequalities in the student population when students were expected to study from home, as indeed it also did among academics and professional staff. An across-the-board “online pivot” was impossible, and a quarter of students did not have modules move online. While most students had some kind of device, this hardware was extremely uneven in capability. Internet access in general is not widespread; only 11% of households have internet access, constrained also by rural/urban connectivity divides and lack of electricity. The cost of data is high. Yet the elite have access and resources comparable to what elites have elsewhere.

Even in the richest countries, the plight of vulnerable students and those with barriers to learning has been foregrounded.

Although the state mandated that cell phone companies provide “zero rated” (free) access to educational websites during 2020, this offering comes with terms and conditions.

As elsewhere, the pandemic made visible the critical role played by on-campus facilities and resources, including computer laboratories, Wi-Fi, and residences. TENET (Tertiary

Education & Research Network of South Africa) provides uncongested bandwidth to all public universities in the country, with every main campus connected to bandwidth of at least 10 Gbps. Nevertheless, real differences remain between rural and urban, as well as between main and sub campuses.

The issues identified in the 2021 *Horizon Report*—AI, microcredentials, learning analytics, open educational resources (OER), blended teaching, and quality online learning—are neither unexpected nor new in South Africa. AI is considered by a Presidential Report to be “the bedrock technology” of the Fourth Industrial Revolution (4IR) leading to coding being taught in schools. Some scholars contest 4IR by arguing that the profound national digital divide should first be resolved, that such tech-centric approaches exacerbate inequalities, and that critical literacies are being neglected.

The use of AI techniques for teaching and learning is still in its early days, although there are interesting examples, especially in more privileged contexts. Learning analytics has been on higher education's agenda since 2014, largely through the *Siyaphumelela* initiative to encourage the use of data analytics to enhance South African university student success. OER are acknowledged in national and institutional policies. While there has been modest uptake, a constraint may be copyright legislation, whereby employers (i.e., universities) own the copyright for employees' works. Nevertheless, a 2020 survey found that almost a quarter of students had downloaded OER during the pandemic. As elsewhere in the world, the shift to emergency remote teaching, to physically distanced teaching, and to hybrid models has led to pedagogical changes that many argue should continue in order to improve the quality of the student learning experience.

The pandemic has undoubtedly made inequities visible in the higher education sector globally—by sending students home, universities have found it impossible to ignore the realities of students' vastly different circumstances. Even in the richest countries, the plight of vulnerable students and those with barriers to learning has been foregrounded. Ironically, given the depth of existing national inequality, South African educators may have been better prepared than other nations for designing remote experiences based on equity principles; sadly, this was not new.

Therefore, the question is, what do these trends mean for equity and inequality for higher education, especially for teaching and learning? Research, investigation, and experimentation need to consider the following issues:

- What are the risks of collecting and analyzing student data, especially for poor students, students with barriers to learning, and students from the peripheries? In what ways are they more vulnerable to exploitation?
- How can data practices in higher education be carried out in a manner that pays back to communities from which data is extracted?
- As data literacies become more complex, how can these be integrated into higher education curricula in culturally appropriate ways?

- Whose interests are being served by new models of teaching and learning provision? Are they, as some claim, simply creating a second—and lesser—tier of education for the less well-off?
- How can systems be designed so that stackable credentials serve the public good, rather than only narrowly addressing employers' needs?
- How can the broader social risks of algorithmic bias be mitigated in universities, given that AI is not yet widespread?
- Since OER have such obvious benefits for higher education in terms of adaptability and cost savings, why are they not more widely created and used? What are the enablers and constraints for their uptake?
- What is the role of private companies in emergent forms of blended and online learning? Given the speed at which new stakeholders have entered the higher education ecosystem, what have the risks been of these new relationships? How can less-well-resourced universities, in particular, ameliorate such risks?

Addressing these questions will take higher education a few steps closer to reaching several of the UN **sustainable development goals**, especially quality education (4), decent work (8), infrastructure (9), and reduced inequalities (10). While South Africa has been the focus here, the implications are global in urgency.

Author Bio

Professor Laura Czerniewicz plays a key strategic and scholarly role in higher education institutionally, nationally, and internationally in the areas of blended/online learning and open education. She has been the founding director of several teaching and learning structures, most recently the University of Cape Town's Centre for Innovation in Learning and Teaching. Her multiple roles in education have included academic, researcher, strategist, advocate, teacher, teacher trainer, and publisher. Threaded through all her work has been a focus on equity and digital inequality. Find her on Twitter [@czernie](#) and on [her blog](#).

TURKISH HIGHER EDUCATION

Aras Bozkurt, Associate Professor of Distance Education, Anadolu University

As of 2020, there are 207 universities in Turkey, of which 129 are state universities and 78 are private universities. The population of the country is roughly 84 million, and approximately 10% of the overall population are students enrolled in higher education (HE) institutions. One of the interesting aspects of Turkish HE is that almost half of HE students are enrolled in open and distance learning (ODL) universities. Anadolu University, a **giga university** that operates locally and globally and has approximately 3 million students, offers education to nearly half of all Turkish HE students.

Current Turkish HE policies are centered on fostering digital transformation and improving the digital competence of faculty members. The large number of HE students requires the use of open and flexible approaches and the establishment of adaptive systems to better deliver educational content and provide high-quality education.

The main strengths of the Turkish HE system include the number of ODL institutions, the access to free education offered by publicly funded HE institutions, and the growing social demand to access HE. On the other hand, its weaknesses are rooted in centralized policy-making processes, overreliance on technology-centric solutions, and the lack of quality assurance in educational processes. Moreover, the high unemployment rates of graduates pose a major challenge and can trigger social tension, signaling the need for further reforms in strategic planning. In this context, implications derived from the 2021 *Horizon Report* are highly relevant to Turkish HE.

Although openness in education has been a widely adopted approach to provide access and learning opportunities in Turkish higher education, its function in providing educational content has been neglected.

Digital Transformation through Hard and Soft Technologies

Seeking solutions in the HE landscape through hard technologies (e.g., computers, machines) to address the “what” and through soft technologies (e.g., theories, models, frameworks) to address the “how” is essential, and there needs to be a **balance between these two types of technologies**. Developing such an

understanding is critical for Turkish HE, as the effective use of hard and soft technologies can be assured if they are integrated in a balanced way.

Although digital transformation is at the top of the HE agenda and is responsible for shaping many HE policies, the Achilles’ heel of Turkish HE is the overreliance on solutions oriented toward hard technologies and minimal investment in soft technologies. For instance, recent emerging key technologies and practices in HE according to the 2021 *Horizon Report* include AI and learning analytics, which have attracted much attention. Yet how to fully benefit from these technologies to provide personalized and adaptive learning has not been clearly articulated. Additionally, the digital footprints, privacy concerns, surveillance, and ethics associated with these technologies pose secondary concerns. The tendency to invest in mostly hard technologies widens the digital divide and thereby raises issues about social justice, equality, and equity. In addition, since digital transformation is generally perceived and shaped around techno-centric views, questions arise concerning faculty development on issues such as digital competencies and skills.

Providing Flexible Entry Points through Blended/Hybrid Modes of Education

The shift to online distance education, the widespread use of remote learning, and the increasing use of educational technologies in the global educational landscape have fueled the adoption of blended/hybrid modes of education, and implications emerging due to these developments are highly relevant for Turkish HE. These developments are needed to ensure the continuity of education in future crises, provide flexible entry points for students, make the HE system more resilient, and expand education beyond the campus walls. This suggests that reforms should be made in organizational structures and regulatory legislation. It also suggests, most notably, that curriculum should be redesigned and that students, faculty, and institutions should be equipped with digital competencies to improve capacity and maneuverability within the wider area of the digitalized educational landscape.

Creating an Open Learning Ecology

Although openness in education has been a widely adopted approach to provide access and learning opportunities in Turkish HE, its function in providing educational content has been neglected. Although cultural motives highlight the value of openness and sharing in social life, the requisite awareness in practices is absent in the Turkish HE landscape, which further hinders the adaptation of open educational practices (OEP) and open educational resources (OER). One of Turkish HE's main challenges is to overcome the perception that "openly available" means poor quality.

Considering the high social demand for HE, creating an open learning ecology would reduce the burden on Turkish HE and promote lifelong, life-wide, and life-deep learning. This view implies that Turkish HE should encourage faculty to adopt OEP and OER in their educational practices and that existing good cases should be promoted. In this process, special focus should be given to ensuring that the practices are of high quality and to increasing awareness through culturally relevant approaches.

Moving Forward

The 2021 *Horizon Report* and the current state of Turkish HE indicate that digital transformation is needed to empower Turkish HE, which has a massive number of students. One of the rationales for digital transformation is the need for a smooth transition to and effective implementation of blended/hybrid modes of education. However, this requires a balance between hard and soft technologies and placing priority on improving the digital competencies of faculty and the digital capabilities of HE institutions. There is also a need for creating an agenda that focuses on open learning ecologies, which would require raising awareness on OEP and OER by prioritizing local needs.

Author Bio

Aras Bozkurt is a researcher and faculty member in the Department of Distance Education, Open Education Faculty, at Anadolu University, Turkey. He holds MA and PhD degrees in distance education. Bozkurt conducts empirical studies on distance education, open and distance learning, and online learning, to which he applies various critical theories, such as connectivism, rhizomatic learning, and heutagogy. He is also interested in emerging research paradigms, including social network analysis, sentiment analysis, and data mining. He shares his views on his Twitter feed [@arasbozkurt](https://twitter.com/arasbozkurt).

US COMMUNITY COLLEGES

Steven Crawford, District Director for the Maricopa Center for Learning and Innovation, Maricopa Community Colleges

Utilizing a variety of datasets from the past five years, the American Association of Community Colleges reported that there are currently 1,044 community colleges in the United States and that in the 2018–19 academic year they awarded 878,900 associate degrees, 619,711 certificates, and 20,700 baccalaureate degrees. Among community college students, 44% are white, 27% are Hispanic, and 13% are black. Although the majority of students are under the age of 22, 36% of our students are between the ages of 22 and 39.

Other important demographics show that 29% of the students are first-generation college students, 15% are single parents, 20% have disabilities, 57% are women, 65% of the students are taking courses part-time, and 62% of our full-time students work. Community colleges were experiencing a decline in enrollment even before the pandemic, and the National Student Clearinghouse Research Center indicated that **community colleges experienced a 10.1% decline** in enrollment nationwide this past fall.

Flexible Learning Opportunities for Students

Community colleges must provide more flexible options for our students as we shift from remote teaching to quality online learning and increase the use of blended/hybrid modes/teaching models. Although many faculty and students want to return to the classroom, others want to maintain the flexibility offered by online and blended learning courses. Colleges need to expand their learning modalities to meet the students where they are. Some students will need to have a classroom experience to be successful, but others will need the flexibility of participating part-time in a classroom experience to continue working while pursuing their education.

Some students will need to have a classroom experience to be successful, but others will need the flexibility of participating part-time in a classroom experience to continue working while pursuing their education.

When developing blended learning courses, some programs may opt to reduce seat time and schedule all of the face-to-face sessions of their courses in a single day to allow students to have more flexibility in their work schedules, with the remaining workload being conducted online, whereas other programs may opt to offer some courses in synchronous online formats. However, because one of the greatest barriers to the adoption of blended and online learning is the digital divide, we must also support universal broadband efforts.

Flexible Learning through Microcredentials

Community colleges should adopt a microcredentialing program for flexible faculty development as they begin investing in similar programs for their students. Doing so could assist faculty in developing an understanding of these types of programs, as some of our industry partners are beginning to request programs based on microcredentials—often referred to as badging—as a way to clearly articulate the skills that our graduates possess.

As institutions begin to explore these types of programs, they can begin by transforming their faculty development programs. Most measures of faculty development programs focus on whether a faculty member attended a workshop, without any evidence that the concepts were learned or implemented in the faculty members' teaching practice. Badges should be awarded for the implementation of learned skills, not attendance. This allows for multiple pathways of professional development—such as prior knowledge, attending workshops and conferences, or being mentored—to be included in a portfolio of work that demonstrates their ability to meet specified competencies.

Programs that are implemented to improve the quality of online programs and expand blended learning programs also have some overlaps in skills; therefore, a microcredentialing program can help prevent faculty who participate in these programs from taking workshops that contain duplicative content. Although all faculty would benefit from a microcredentialing program, adjunct faculty may especially benefit because some come to our institutions with teaching experiences in a K–12 system or other institutions of higher education.

Flexibility of Open Educational Resources

Open educational resources (OER) provide faculty the ability to customize learning resources that can assist in closing the gaps created by systemic racism and implicit bias found in traditional resources. While OER has been touted as a way to provide free or low-cost learning materials, the greatest benefit is the flexibility they provide faculty to meet their students' needs.

Because most textbooks are developed for a national audience, they overlook the student populations and events of our communities. But faculty who utilize open resources can include images that are culturally representative of their students and use local examples to supplement the learning materials to provide meaningful context.

Faculty and instructional designers who develop OER are adding an emphasis on reusable assessments. These reusable assignments can provide value beyond the classroom because they provide students an opportunity to develop materials that can be used as future OER, thus allowing faculty to continue to develop learning materials that reflect their students while adding further value to the learning experience.

Final Thoughts

If there is a single concept that community college faculty, staff, and leadership should take away from the 2021 *Horizon Report*, it is *flexibility*. The recent enrollment declines are likely to continue, and our student population will continue to diversify. To help our students achieve their goals, we will need to offer courses and programs in a more diversified way that assists in reducing the barriers our students are facing.

Author Bio

Steven Crawford is the District Director at the Maricopa Center for Learning and Innovation at Maricopa Community Colleges. He has been involved in higher education for over 25 years at multiple institutions as a technologist, instructional designer, and adjunct faculty. Crawford has authored several articles and chapters on flipped teaching and blended learning. He is also a Quality Matters Facilitator and Master Reviewer.

US PUBLIC DOCTORAL INSTITUTIONS

Victoria L. Mondelli, Founding Director, Teaching for Learning Center, University of Missouri

Given that each US state has at least one public research university and that these institutions serve approximately **four million students annually**, the teaching and learning implications of the 2021 *Horizon Report* are far reaching for this segment of higher education. Recent budget strains due to decreased enrollments and diminished state budgets are forcing institutions to reexamine the teaching and learning endeavor vis-à-vis the research endeavor. US publics are at a crossroads as they contend with the need to leverage technology both to realize efficiencies across the enterprise and to raise the quality of the student experience. Our chief challenges pertain to how we evolve existing networks so that professional development for educators is deemed essential (rather than nice to have) and how we redesign (often) calcified faculty reward structures to incentivize widescale teaching and learning improvements.

Collaboration for Organized Openness

For US publics prioritizing high-quality (read *evidence-based and inclusive*) teaching and learning environments, it is vital to band together or else come up short in meeting urgent needs. For this under-resourced segment of higher education, the costs and sophistication of the six key technologies and practices identified in the *Horizon Report* necessitate more intensive collaboration with other institutions across public and private terrain. Further, networks combining these institutions with nonprofits and social justice-minded corporate partners leverage talents and resources to meet the moment, which demands history's most flexible, humane, next-generation student experience. The old method of offering a faculty stipend to a few open ed fellows won't move the needle. Instead, US publics need high-quality curated open educational development assets to achieve widescale change with faculty and instructors as they become proficient wielders of ed tech to (re-)make equitable and engaging learning.

Now is an opportune time to reimagine reward systems toward a shared strategic priority: success for all learners.

Centers of teaching and learning (CTLs) at US publics rarely enjoy the same bench depth as their counterparts in the private sector. Yet faculty support has never been more critical. Publics need one another, and Cornell University and the University of Michigan are modelling how to lead in this space. They offer high-quality open courses to faculty and other educators for **teaching and learning in the diverse classroom** and **resilient design**, respectively. Other open PD resources exist, such as the Every Learner Everywhere **coaching service** for the advancement of equity and inclusion in blended and online learning environments. Oftentimes, it is a scavenger hunt to uncover these much-needed aids, yet the burden of the hunt could be mitigated with a clearinghouse for this purpose.

Mindset is another hurdle. The prevailing ethos of competitiveness between US public doctoral institutions is starting to shift with new collaborative/open behaviors taking root thanks to relatively new requirements for openness from grantmaking entities such as the NSF and large private foundations. With organizational prowess and extraordinary reach, US publics can bring their collective wherewithal forward and unlock a cooperative orientation offering substantial mutual benefits. Collaboratives such as research-practitioner partnerships and multi-institutional community groups provide additional models for how to meet daunting shared goals.

Evaluation and Reward Structures

Now is an opportune time to reimagine reward systems toward a shared strategic priority: success for all learners. Without recalibrated reward systems to give ample credit for the adoption of inclusive, effective teaching practices, faculty/instructors receive a void that signals that the investment of effort to improve teaching is not a high priority. Research productivity is meticulously measured and "counts" for tenure and promotion processes and contract renewal. However, despite the vociferous student success rhetoric proliferating on almost all campuses, the adoption of evidence-based and

inclusive teaching and learning practices has an uneven and still trailing presence in the successful dossier. Unless colleges and universities erect measurement and reward systems that offer more credit to educators for investing in teaching, any meaningful expectations for educators to grow proficiency and achieve mastery with the identified key technology tools and practices are dashed. It becomes prudent, now, for this sector of higher education to check for the alignment of expectations with rewards so that there is systemic encouragement of evidence-based and inclusive approaches.

Faculty members applying for tenure or promotion at doctoral institutions need not convince anyone that research matters—that's the dominant paradigm. Persuasion that there is room to invest in teaching quality has been the harder sell. The Association of American Universities (composed of 65 leading research institutions) is helping members rethink evaluation frameworks to advance teaching as a high priority, on par with research. AAU's ongoing conferences and the living [matrix of campus strategies](#) offer resources and access to a community of scholar-practitioners. Locally, cooperation between administrators and faculty governance is the lynchpin to bend and evolve an evaluation system to serve the two masters: teaching and research.

Higher education evaluation systems need to rest on the truth that *effective* teaching is necessarily *inclusive* teaching. Through development opportunities, educators grow in awareness and successfully implement a variety of structures for diverse learners. As this teaching expertise is acknowledged and rewarded, it is sustained. Trauma-informed pedagogies, pedagogies of care, universal design for learning—these and other humane approaches need scaling. Administrators and faculty governance bodies may conduct analyses of the existing reward structures. Together, they have the shared authority to enact systemic change at this impactful level.

Colleges and universities strained to pivot in 2020. Going forward, US public doctoral institutions have an opportunity to build on the substantial work that was accomplished during the pivot. Emerging from the pandemic with a heightened awareness of shared suffering and shared strengths, we are poised to increase instructor effectiveness and student academic success. The enhancement of collaborative networks for open development resources and practices, and efforts for revised institutional evaluation systems, are but two ways to strengthen this sector so that students and society will be well served.

Author Bio

Currently, **Victoria L. Mondelli** serves as Founding Director of the University of Missouri's Teaching for Learning Center. She leads strategic teaching initiatives that intentionally build a sense of belonging for all learners through structured active learning and transparent assessment. She supports innovative curriculum and creative teaching practices, offering design expertise to those interested in infusing play and games into the learning environment. Twitter handle: [@torimondelli](#)

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 industries. This year's group included returning and first-time *Horizon* panelists, all sought out for their unique viewpoints, as well as their contributions and leadership within their respective domains. The panel represents a balance of global contexts, with members contributing from North America, Europe, Asia, Australia, and Africa. 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 (ITTF) 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 ITTF's foresight methodology and drew upon the ITTF 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 ITTF "STEEP" trends framework enabled our panel to focus on **S**ocial, **T**echnological, **E**conomic, **E**nvironmental, and **P**olitical 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 ITTF 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

The following questions were designed to elicit an open range of responses from the expert panel and then to narrow those responses to a consensus through rank-order voting. Voting on trends was done separately for each of the five STEEP trend categories: social, technological, economic, educational, and political.

STEER Trends

Round 1 (for each STEEP trend category):

Please use the following format to catalog each of your Trends and Signals in your discussion post: (1) Trend; (2) Signal/evidence of this trend; and (3) Impact on the future of teaching and learning in higher education.

Round 2 (for each STEEP trend category):

The list below summarizes the trends provided by this year's Horizon panel. From this list, please select the top ten (10) trends you believe will have the most influence on the future of higher education teaching and learning.

Round 3 (for each STEEP trend category):

The list below summarizes the top ten (10) trends provided by this year's Horizon panel. From this list, please select the top three (3) trends you believe will have the most influence on the future of higher education teaching and learning.

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!

Round 2: Please select the top 12 techs and practices you believe will be most impactful for the future of global higher education teaching and learning.

Round 3:

Panelists were asked to respond to the following questions about each of the top six techs and practices, with the latter six questions used as ratings on important dimensions of interest:

- Do you anticipate the adoption of <tech/practice> will require new kinds of literacies on the part of learners and instructors?
- How useful will <tech/practice> be in helping institutions address issues of equity and inclusion in teaching and learning practice?
- 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 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 adopting <tech/practice>?
- Relative to institution size and budget, how much institutional spending do you anticipate would be required to adopt <tech/practice> across the curriculum?
- How important do you think <tech/practice> will be for institutions seeking to establish more flexible approaches to teaching and learning as we begin to emerge from the pandemic?

EXPERT PANEL ROSTER

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