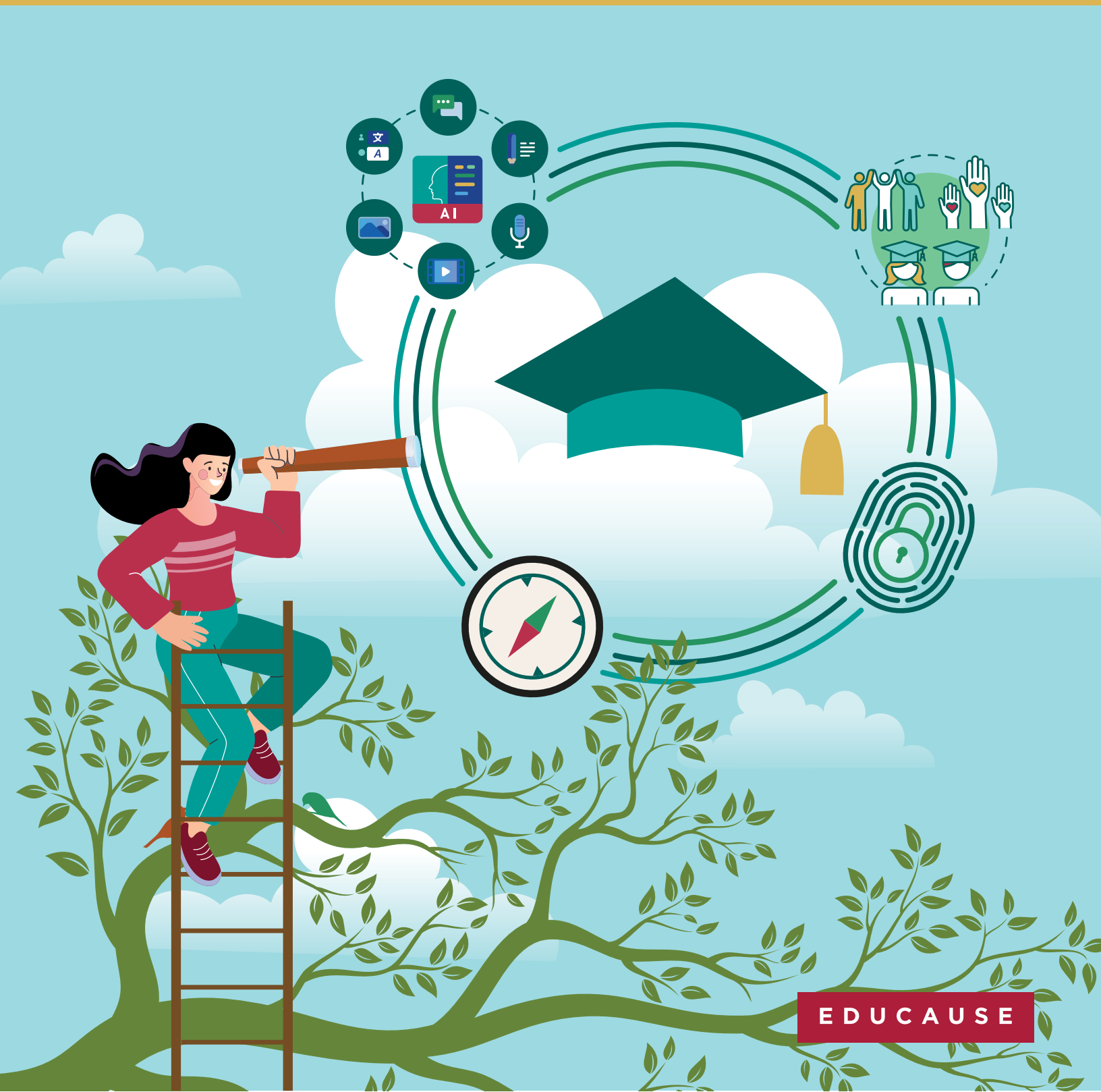
2024 EDUCAUSE Horizon Report®
Teaching and Learning Edition



2024 EDUCAUSE Horizon Report®
Teaching and Learning Edition

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Kathe Pelletier, Mark McCormack, Nicole Muscanell, Jamie Reeves, Jenay Robert, and Nichole Arbino, *2024 EDUCAUSE Horizon Report, Teaching and Learning Edition* (Boulder, CO: EDUCAUSE, 2024).

ISBN: 978-1-933046-20-4

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EXECUTIVE SUMMARY

In the denouement of the COVID-19 pandemic, talk of a return to "normalcy" in higher education belies the great challenges and ongoing disruptions that yet lie ahead for many institutions. Public perceptions of the value of postsecondary education continue their downward slide, placing institutions in the position of having to demonstrate their worth and find solutions to declining enrollments. Data and analytics capabilities continue to evolve, introducing new opportunities and new risks to the institution. Chief among these capabilities, generative AI promises to change teaching and learning in ways many of us have yet to fully understand or prepare for. For this year's teaching and learning *Horizon Report*, expert panelists' discussions highlighted and wrestled with these present and looming challenges for higher education. This report summarizes the results of those discussions and serves as one vantage point on where our future may be headed. This project was grounded in a modified Delphi methodology that seeks to elevate the collective perspectives and knowledge of a diverse group of experts, and the panelists' activities were facilitated using tools adapted from the Institute for the Future.

Trends

As a first activity, we asked the Horizon panelists to provide input on the macro trends they believe are going to shape the future of postsecondary teaching and learning and to provide observable evidence for those trends. To ensure an expansive view of the larger trends serving as context for institutions of higher education, panelists provided input across five trend categories: social, technological, economic, environmental, and political. Given the widespread impacts of emerging AI technologies on higher education, we are also including in this year's report a list of "honorary trends" focused on AI. After several rounds of voting, the panelists selected the following trends as the most important:

Social

- Public perception of the value of higher education is declining.
- Student demographics are changing.
- Students are increasingly demanding access to learning anytime, anywhere.

Technological

- Concerns about cybersecurity and privacy are increasing.
- The use of learning analytics continues to rise.
- The digital divide persists.

Economic

- The demand for and focus on workforce skills is growing.
- Challenges for employee retention are increasing.
- Student debt is increasingly impacting students' enrollment decisions.

Environmental

- Higher ed institutions are increasing their commitment to sustainability.
- Concerns about the impact of big data tools on the environment are rising.
- The demand for green skills in the workforce is increasing.

Political

- Political polarization in the United States continues to impact higher education.
- Government policy is increasingly influencing education.
- The need is growing for policies that address emerging technologies.

Honorary AI Trends

- AI is changing the way we communicate.
- AI tools have growing potential to reshape pedagogy and student experiences.
- AI is increasingly having an impact on the economy and workforce.
- AI is increasingly being used to address climate change and sustainability issues.
- The potential for the use of AI in politics is growing.

Key Technologies and Practices

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

- Finding Appropriate Uses for AI-Enabled Technology
- Supporting AI Fluency
- Supporting Equitable and Inclusive Learning
- Protecting Data Privacy and Security
- Navigating Misinformation
- Supporting Mental Health

Having identified the most important technologies and practices, panelists were then asked to reflect on the impacts those technologies and practices would likely have at an institution. We asked panelists to consider those impacts along several dimensions important to higher education: the impacts of those technologies and practices on the macro trends already identified by the panelists; potential key stakeholder (staff, faculty, students) uses of those technologies and practices; risks of using those technologies and practices; and whether and how those technologies and practices support equity and inclusion.

Scenarios

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

- **Growth:** In this future, unfettered growth of AI technologies has led to widespread and substantive changes to the global workforce across most industries. New skills are needed by a diverse and nontraditional community of students. Higher education institutions have significantly revised their education models to focus on quickly evolving workforce skills, leveraging anytime/anywhere learning to improve instructional agility and responsiveness to the demands of industry.
- **Constraint:** In this future, widespread surges in cybercrime are all over the news. Media outlets compare online environments to crime-riddled metropolitan areas, cautioning the public to shore up their data and device protection or to simply stay offline whenever possible. Security and privacy advocates find allies in climate and ethics leaders who decry the environmental and human costs of excessive data collection and use, gaining sufficient influence to lead sweeping social and political changes in national and global data practices.
- **Collapse:** In this future, global political division and conflict is putting pressure on higher education institutions. A growing number of institutions face an impossible choice: align with local, state, and federal political and moral ideologies, thereby alienating a large portion of learners and instructors and staff, or lose vital state and federal funding and face unavoidable shutdown.
- **Transformation:** In this future, declining public perceptions of higher education and the mounting student debt crisis have exacerbated enrollment challenges for institutions. Higher education leaders call for institutions to improve their value to learners by refocusing on hyper-individualized instruction and a commitment to the greater good.

TRENDS: SCANNING THE HORIZON

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

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

In this year's report, we see more and more evidence that higher education must transform itself to retain value and relevance amid a changing student demographic, the increasing influence of government policy on education in a politically polarized environment, and the continuing digital divide. Public perception of the value of higher education continues to decline, and student debt is increasingly factoring in students' enrollment decisions. An increasing commitment to sustainability in higher education will also require institutions to transform building and data-center policies and practices.

Meanwhile, challenges in retaining employees, an increasing focus on and demand for workforce skills and "anytime, anywhere" learning, and growing demand for "green" skills suggest the need for a tighter connection between learning outcomes and workforce preparedness and for a rethinking of not only the content of the curriculum but also its delivery models.

Trends related to data also point to the need for transformation. The deepening concerns about the impact of big data tools and about cybersecurity and privacy become even more critical as we see the continued rise of learning analytics.

Threaded throughout these trends and their potential impacts, of course, was artificial intelligence. For the first time in the history of this research, panelists identified AI-related trends across all five of the STEEP categories. Thus, in this edition of the *Horizon Report*, we include an honorary category of AI trends. The potential impacts of AI are broad and far-reaching. AI is changing the way we communicate, beginning to reshape pedagogy and student experiences, increasingly impacting the economy and the workforce, and being used to address climate change and sustainability issues. Meanwhile, the potential for using AI in politics is growing. Overall, the AI trends depict a potential future in which humans will need to navigate the impact of AI amid the ongoing development of AI tools.

Social

Public perception of the value of higher education is declining.

Student demographics are changing.

Students are increasingly demanding access to learning anytime, anywhere.

Technological

Concerns about cybersecurity and privacy are increasing.

The use of learning analytics continues to rise.

The digital divide persists.

Economic

The demand for and focus on workforce skills is growing.

Challenges for employee retention are increasing.

Student debt is increasingly impacting students' enrollment decisions.

Environmental

Higher ed institutions are increasing their commitment to sustainability.

Concerns about the impact of big data tools on the environment are rising.

The demand for green skills in the workforce is increasing.

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

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

Political

Political polarization in the United States continues to impact higher education.

Government policy is increasingly influencing education.

The need is growing for policies that address emerging technologies.

Honorary Trends: Artificial Intelligence

Social Trends

Technological Trends

Economic Trends

Environmental Trends

Political Trends

SOCIAL TRENDS

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

Public perception of the value of higher education is declining.

Impact: Since 2015, negative public perceptions about higher education and the value of a college degree have grown. To be clear, many still agree that college is valuable, and research still shows that a college education is economically and socially valuable, not only to individuals but to the country as a whole. But people are increasingly losing their trust and confidence in higher education and are questioning whether college is worth the increasingly hefty price tag. Young people are uncertain that a degree will help them secure a well-paying job and are put off by the debt they would accumulate by attending college. This has the potential to exacerbate enrollment issues and could lead to varying impacts, both positive and negative. With this declining interest in higher education, institutions may face further economic challenges such as decreased state and federal funding and donor contributions, which could impact all areas of institutional operations, including staffing, services, and curriculum. There could be broader, societal-level impacts as well—fewer people attending college can slow economic growth by creating or worsening labor shortages, lowering tax revenues, and increasing the demand for social services. Socially and culturally, we could see declines in important skill areas that many companies desire, such as critical thinking, creativity, curiosity, and resilience. Divisions could also widen over politics, socioeconomic status, race and ethnicity, and gender and sexuality as individuals have fewer formal opportunities to critically explore different points of view. Yet, with these changing perceptions, we could also see beneficial changes to the higher ed landscape. That is, institutional leaders might need to rethink what teaching and learning looks like to better attract, retain, and serve students. This could lead to the development and implementation of innovative teaching methods and pedagogical approaches that more heavily incorporate experiential learning, technology, and real-world applications. This may also lead to a stronger emphasis on affordability and equity, in addition to ensuring that graduates will benefit from their degrees (e.g., via pathways that focus directly on skills-based learning and workforce development and by forming partnerships with industry to create tangible career opportunities for students).

Evidence: Despite rising concerns about the value of a college education, a recent survey conducted by the American Association of Colleges and Universities (AAC&U) showed that many employers believe that college education is valuable and prepares students for entry into the workforce. In Colorado, lawmakers commissioned an annual report on higher education return on investment, which provides high schoolers with information that they can use to help decide whether they should go to college. The Center on Education and the Workforce at Georgetown University provides rankings by return on investment for 4,500 universities and colleges.

Student demographics are changing.

Impact: Student populations are becoming more diverse in terms of race, ethnicity, gender, age and generational status, and economic background. With the looming enrollment cliff, there will be an increase in nontraditional students pursuing higher ed opportunities. Universities and colleges will need to be prepared to meet students where they are and to find ways to demonstrate the value proposition of higher education to the broader population, including nontraditional students and those from traditionally underserved populations. In addition to finding ways to make education more affordable, pedagogical approaches and curriculum will need to be updated to accommodate the diverse needs of students. Universities and colleges should carefully assess their existing offerings along with workforce and job market trends to make decisions about updating academic programs so that they will meet not only student needs but future employer needs. Institutions can also make their courses more accessible by implementing universal design principles and investing in high-quality online, hybrid, and blended learning options to appeal to students who prefer flexible and remote learning. Alternative credentials such as microcredentials, certifications, and badges will also be attractive to students looking for short-term training in specific areas. Institutions will also need to ensure that faculty are able to adapt to diversifying student cohorts and their differential needs by providing professional development and training opportunities and easy access to instructional resources. Student support services will also need to be more robust—greater numbers of students will need a variety of services such as language, tutoring, and

writing support; support with navigation of college services; mental health and well-being support; and childcare support. With an increasingly heterogeneous student body, institutions will need to find meaningful ways to support student inclusion and belonging, in addition to ensuring that all students have access to resources, support, and holistic learning experiences. As part of this, institutions may need to invest further in DEI initiatives and also pursue new options for addressing these needs without the "DEI" label, given political trends across states and regions.

Evidence: The Sorenson Impact Center at the University of Utah recently launched the Student Trends and Enrollment Projections Dashboard (STEP). The dashboard can help institutions prepare for demographic shifts, allowing them to visualize relationships between population and enrollment trends. Despite changing demographics, racial and socioeconomic diversity at higher ed institutions in the United States might decline, at least temporarily, due to the Supreme Court ruling banning affirmative action in college admissions. According to an analysis done by the Center on Education and the Workforce, "the most effective way of increasing socioeconomic diversity at selective colleges is to consider race in the admissions process, not to ignore it."

Students are increasingly demanding access to learning anytime, anywhere.

Impact: The rise of hybrid-based learning during the pandemic allowed students to discover new ways of accessing education and has led to a growing demand for flexible and personalized options for learning. Students are increasingly interested in having access to multiple modes for learning and more choice when it comes to deciding how to participate. Interest is also growing in self-paced learning and microlearning (learning content that targets specific skills and is presented in a bite-sized format). Many institutions continue to offer online and hybrid experiences. Moving forward, however, institutions will need to put more investments into ensuring that high-quality programs and courses are developed and implemented in addition to building the infrastructure to support the needs of programs that are not fully on-site, including up-to-date technologies (e.g., robust LMSs, 5G networks, and cloud computing). To support personalization, institutions will need to rely more on AI-powered technology that can offer real-time, personalized feedback; tailored learning pathways based on individual abilities and performance; and tutoring. These changes will increase the burden on faculty, who will be tasked with developing content that can be delivered via different modes of instruction, and on students, who may be participating in different modes at any given time. As a result, there will be a growing need for faculty to collaborate with instructional designers to design courses and assessments that are not only flexible and personalized but also are authentic and accessible regardless of their delivery methods. Faculty will also need help keeping up with emerging technologies to support their teaching. As institutions focus more on flexibility for students, they will face some trade-offs between convenience and efficacy. With faculty pivoting to meet the diverse needs of their students, we may also see their role shift more toward a mentor (and away from a mere purveyor of knowledge). Movement toward anytime/anywhere learning will also present significant challenges. Institutions will need to navigate potential trade-offs between convenience and efficacy, finding the right balance of letting students have choice and options while also still ensuring that they are adequately meeting pedagogical goals and are acquiring skills and knowledge needed to succeed beyond college. Institutions need to explore best practices for teaching and learning across modalities and stay informed on research that examines student outcomes when learning anywhere and anytime to ensure that a move toward flexibility, microlearning, and personalization does not negatively impact student outcomes.

Evidence: According to the 2023 Changing Landscape of Online Education (CHLOE) report, "the majority of survey participants report increased student demand for online and hybrid learning juxtaposed with decreased demand for face-to-face courses and programs." Eight colleges in California are participating in a pilot competency-based educational program that allows students to complete courses at their own pace. Colorado State University procured a campus-wide LinkedIn Learning license so that all students, faculty, and staff can have free access to on-demand video libraries and educational tools.

FURTHER READING

Chronicle of Higher Education
"What the Public Really Thinks About Higher Education"

National Center for Education Statistics
"Projections of Education Statistics to 2028: Enrollment in Degree-Granting Postsecondary Institutions"

McKinsey & Company
"What Do Higher Education Students Want from Online Learning?"

TECHNOLOGICAL TRENDS

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

Concerns about cybersecurity and privacy are increasing.

Impact: Some colleges and universities have recently seen an increase in cyberattacks, likely due to a never-ending cycle in which institutions develop countermeasures and scammers develop new approaches and find workarounds to safeguards implemented. The rise in concerns about cybersecurity and privacy is perhaps unsurprising. Phishing scams are increasingly sophisticated, and scammers are finding ways to tailor emails to individuals in a way that makes them more attractive and clickable. As one panelist noted, "It is scary to think about shutting down an entire university because someone clicked on a link." These concerns may only be exacerbated in the future as student demand for learning anytime, anywhere grows, necessitating the adoption of more technology and software programs that collect data. As both risks and concerns grow, we may see further changes in federal policy and the adoption of more rigid security policies and practices, which could ultimately lead to tighter controls and reduced functionality when it comes to institutional computers, content, and applications. We may also see responsibility increasingly placed on stakeholders. Campuses will likely implement more cybersecurity and privacy awareness training for all constituents. More ethical responsibilities may be placed on instructional designers and faculty, particularly in choosing and implementing technology. Institutions may also consider requiring students to have up-to-date hardware and software in order to transact with services such as LMS, email, and SIS portals. These changes have the potential to cause frustration and could disrupt productivity, especially for faculty and students who need easy access to technology to support their teaching and learning endeavors. IT departments already and will increasingly face challenges in finding technology that meets security requirements, in addition to navigating the ever-changing contracting and insurance requirements from third-party vendors. This will make it more difficult for institutions to adopt technology solutions, especially emerging technologies, and could cause a spike in the market for restricted, closed systems that pull from gated data. An increase in student concerns over data security and privacy will also potentially impact the collection and use of data at institutions. Increasing awareness and concern on the part of students could press institutions to be more transparent and provide opportunities for students to opt out and have more control of their data. Security risks are not going away, and thus neither will concerns about security and privacy. Institutions will need to continue to drive changes in policies, practices, and professional development focused on safeguarding the collection, storage, ethical use, and dissemination of data.

Evidence: According to a recent report by IBM, the average data breach at higher education organizations cost over $3 million in 2023. At the University of Wisconsin–Madison, thousands of students and instructors were enrolled in (and informed afterwards) a data monitoring program without any ability to opt out.

The use of learning analytics continues to rise.

Impact: Globally, the education and learning analytics market is predicted to grow substantially between 2023 and 2028. Part of this growth is being driven by an increase in awareness of how data can inform decisions about developing and updating academic programs to meet student needs and improve student success. Institutional leaders are increasingly aware that learning analytics are becoming more and more sophisticated and can be used in a number of ways to improve student success, including the development of personalized and adaptive learning experiences, identification of at-risk students (early intervention) and students who are struggling, and identification of curriculum areas and pedagogical approaches that may need to be revised or updated. Despite the increase in awareness and predicted increase in the adoption of learning analytics technologies, the use of analytics to inform teaching and learning practices is still evolving, and many institutions face challenges in harnessing analytics at a larger scale. As institutions adopt and plan for how to harness learning analytics they will need to address some of these obstacles, including financial cost. Learning analytics relies on technology, the infrastructure to support that technology (including data frameworks), and people (e.g., faculty as frontline data collectors and staff to support aspects of data management, analysis, and interpretation and data literacy initiatives). Ethical and legal risks will also need to be mitigated. Universities

and colleges need to ensure that they are in compliance with regulations and can adequately protect students' privacy. They will also need to address issues of misuse and misinterpretation of data, for example, by implementing best practices that minimize biases stemming from learning technologies (especially those utilizing AI and machine learning algorithms). Institutions will also need to garner buy-in from stakeholders, including faculty and students—some may be hesitant or even distrusting of the use of student data, worrying not only about security and privacy but also that a focus on key performance indicators may be reductionist and ignore individual differences and needs, leading to less authentic learning experiences. Moving forward, institutions will continue to collect an ever-increasing amount of data. Thus, they will need to have strategic plans for how to use it to improve student outcomes, in addition to ensuring that stakeholders will be equipped to effectively use it while mitigating potential risks (e.g., by providing support and training on data literacy, ethics, and how to source relevant data from educational technologies such as LMSs).

Evidence: Professors and students who are part of the Brandeis Online Learning Lab (BOLL) at Brandeis University are developing cutting-edge learning analytics tools that aim to improve student engagement in online courses. Researchers at Cornell University showed that shared modeling can help institutions, especially those that lack resources to invest in learning analytics, to conduct their own learning analytics to improve student success. Shared modeling allows institutions to develop their own predictive models using data from other institutions.

The digital divide persists.

Impact: During and following the pandemic, there was a significant increase in global connectivity. Despite the internet becoming more widespread, however, billions of people still don't have access to the internet, and in education, we continue to see a digital divide, especially in rural areas and in low-income and marginalized communities. Universities and colleges are continuing to explore ways to make learning equitable, such as by providing loaner devices to students, partnering with local governments and organizations to expand internet access, and updating their infrastructure to support easier network access across the campus. Still, the divide persists, and now students who lack access to technology are falling behind in the latest technologies, such as AI. The divide could also grow as student interest in online and hybrid learning increases and as universities and colleges focus increasingly on recruiting nontraditional students. Inequities in access to technology not only impact students and their ability to succeed during and after college, especially in a tech-heavy world, but also place pressure on instructors who must consider how to get their students from low-access environments on the same footing as other students and whether adjustments need to made to pedagogy (i.e., limiting the amount of digital-based learning in a course or offering nondigital methods of delivery). However, limiting the use of digital technology could result in lower rates of digital literacy, placing students at a disadvantage as they continue their education and enter the workforce. Moving forward, institutions need not only to find ways to provide access to devices and networks but, more importantly, to train and support their faculty and instructional designers to be able to help students navigate digital learning. Colleges and universities must invest in and develop curriculum on digital literacy, focusing on the critical-thinking skills that students will need to use technology effectively and responsibly.

Evidence: A UNESCO report suggests that the COVID-19 pandemic caused students to be over-reliant on technology, further exacerbating inequalities in technology and education more generally. The University of Montana recently received a $200,000 grant from the National Science Foundation to revolutionize digital access for Montana's tribal colleges and universities.

FURTHER READING

Chronicle of Higher Education
"How Colleges Can Defend Against Cyberattacks"

Solutionpath
"White Paper: Adopting a Data Mindset and an Institutional Approach to Student Success Using Student Engagement Analytics"

Brookings
"AI and the Next Digital Divide in Education"

ECONOMIC TRENDS

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

The demand for and focus on workforce skills is growing.

Impact: As institutions look for ways to attract students and increase their value proposition, greater attention is being placed on workforce development training. Significant workforce changes and trends are also driving this focus on skills-based learning. Digitization and automation are disrupting the workforce, leading to the elimination of some jobs and the creation of others. Companies are increasingly adopting skills-based hiring approaches, and despite concerns over the value of higher ed, it is predicated that a majority of workers will still need formal training, including opportunities for up- and re-skilling. As a result, institutions are already increasing spending on career services and are implementing and expanding alternative credential programs (microcredentials, certifications, badges, and lifelong learning programs). Institutions are also reevaluating traditional degree programs, looking for ways to implement workforce development into curriculum. As institutions put more attention on workforce development, we may see rapid growth not only in alternative credentials but also in traditional programs that have less direct career pathways (e.g., arts, humanities, social sciences). There could also be a shift toward performance indicators derived from professional accreditation agencies, putting less emphasis on the process of learning, and that emphasis on targeted skills could cause other important and transferable skills to be neglected (e.g., critical and creative thinking and exploration and curiosity). Pedagogy could also be impacted—instructors might be less able and less incentivized to explore and use new and creative methods of teaching. Yet, despite potential pitfalls, students would undoubtedly benefit from having access to high-quality, flexible workforce development training and opportunities. As institutions develop new programs and revamp existing ones, they will need time and resources to develop well-rounded and effective curriculum programs that are accessible. They will also need to ensure that students are learning not only job-specific skills but also higher-level cognitive skills that will be just as important in the workforce. Institutions may need to work more closely with industry partners as they develop their programs to ensure that they will meet industry needs, in addition to creating experiential learning opportunities for students. Institutions will also face the challenge of keeping curriculum up to date. Moving forward, the ability to remain agile and responsive to changing learning needs is more important than ever. Universities and colleges will need to develop a model in which curriculum can be changed quickly to meet the demands of the workforce.

Evidence: The State of Skills-Based Hiring 2023 report published by TestGorilla found that over 70% of hiring managers, recruiters, and executives believe that all forms of skills-based hiring are more effective than résumés. In Iowa, Luther College updated its core curriculum to include skill-building courses, including courses on creative, data, religious, scientific, and social systems and textual literacies. A recent report by the Center on Education and the Workforce identifies 10 education, training, and work-based pathway changes with the greatest potential to improve employment outcomes for young adults.

Challenges for employee retention are increasing.

Impact: Employee-retention issues continue to trouble not only higher ed but also the workforce more generally. Within higher ed, many institutions continue to see resignations, and a significant number of staff say they're likely to look for other positions. Beyond higher ed, millions of people are voluntarily leaving their jobs, with Gen Z and millennials being the most likely to job-hop. The impact is significant. Institutions and companies are understaffed, causing increased workloads, burnout, a rapid loss of institutional knowledge, and diminished ability to achieve strategic goals. In higher ed, staffing issues are affecting all aspects of campus business practices, including IT, administration, campus services, research and teaching, and the student experience. To address staffing issues, higher ed institutions need to find ways to be competitive in the job market, focusing especially on salary, workplace flexibility (including access to remote and hybrid work arrangements), and opportunities for mobility and growth. Higher ed could also help address workforce retention issues more broadly by adapting their programs and approaches to meet the evolving needs of businesses and the workforce (i.e., by increasing their efforts toward workforce

development). Because many companies will look for ways to retain employees, there may also be more opportunities for institutions to work with industry partners to produce retention-based products that would be effective incentives to employees, such as tuition discounting, continuing education programs, alternative credentials, and professional development opportunities. Workers who have access to these opportunities would be able to stay up to date with industry changes and feel more valued in their careers. More access to workforce development opportunities could also improve the ability for students to compete on the job market and, more importantly, will help shape the future workers and leaders and their ability to create and participate in productive, inclusive, nontoxic cultures. Thus, institutions should ensure that their programs emphasize leadership, socioemotional skills, and diversity, equity and inclusion.

Evidence: A growing number of institutions are outsourcing services due to employee-retention issues. For example, Kentucky State University and Bethany College had to outsource their financial aid services due to staff turnover. According to research conducted by Culture Amp, 18% of employees in the United States are thinking about leaving their role in 2024.

Student debt is increasingly impacting students' enrollment decisions.

Impact: Concerns over student debt continue to grow, especially in the United States. More than 40 million Americans are estimated to hold a combined $1.75 trillion in student debt. And recently, the three-year pause on federal student loan payments stemming from the COVID-19 pandemic ended, leaving borrowers scrambling to make payments, many of whom weren't able to do so. Younger generations are now increasingly concerned about the cost of higher ed as they have seen earlier generations struggling with debt. With ongoing enrollment challenges, and government reform difficult to achieve, institutions are being challenged to find ways to make college more affordable to stay competitive as students consider more affordable education options such as trade schools and vocational programs. Institutions need to find ways to move away from a model that places high costs on students who have low economic power during and even after college as they first navigate the workforce. Along these lines, a growing number of universities and colleges are eliminating education debt from the outset by offering alternative sources for financial aid, including merit- and need-based financial aid packages. Some have even implemented "no loan" policies in which the institution meets 100% of a student's financial needs with grants as opposed to loans. Institutions are also investing more in developing cost-effective online/hybrid programs, in addition to placing more emphasis on workforce development, job placement and career counseling, and the adoption of open educational resources. The need for institutions to continue to devote time and resources to reducing student costs and debt will only increase as universities and colleges start looking to attract diverse groups of students from nontraditional populations. If student costs and debt remain high, not only will enrollments continue to be affected but, more importantly, inequities and disparities will be exacerbated. Already, low-income students and those from marginalized groups face the biggest impacts from student debt. In the next few years, these individuals may become more averse to taking on high debt loads to finance their degrees, worsening the underrepresentation of certain groups in higher ed and perpetuating economic and social inequality as those individuals enter the workforce and have fewer opportunities. Student debt may also deter students from pursuing certain degrees, including advanced degrees, potentially causing program cuts and labor shortages.

Evidence: Student loan payments were reinstated in October 2023, yet millions of borrowers are still unable to make payments. According to an article from the U.S. News & World Report, "a small number of U.S. colleges have instituted 'no-loan' policies, eliminating federal loans from financial aid packages in lieu of scholarships, grants and work-study."

FURTHER READING

World Economic Forum
"Future of Jobs Report, 2023"

CUPA-HR
"The CUPA-HR 2023 Higher Education Employee Retention Survey"

Council on Foreign Relations
Is Rising Student Debt Harming the U.S. Economy?

ENVIRONMENTAL TRENDS

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

Higher ed institutions are increasing their commitment to sustainability.

Impact: Climate change continues to impact the environment and individuals globally, and due to this, universities and colleges have been steadily increasing their commitment to sustainability efforts. A growing number of universities and colleges are committing to achieving carbon neutrality by 2050. Some of this growth is driven by student interest in sustainability as more and more students are interested in their institution's sustainability efforts (sometimes even considering this factor when deciding which college to enroll at), and they are increasingly interested in participating in courses, research projects, and other initiatives focused on environmental issues. A rise in sustainability-minded students will likely guide campus policy decisions moving forward. As part of their increased efforts toward sustainability, institutions are doing a number of things to reduce their carbon emissions, such as finding and using renewable sources of energy. Some institutions are composting food waste into nutrient-rich soil, replacing heating systems that rely on fire and steaming with geothermal energy, harvesting biomass energy, installing wind turbines to generate electricity, using regenerative energy and sustainable materials in construction projects, and adopting green technology. Institutions are also making curriculum changes, offering more programs and courses on environmental issues and sustainability, and some are even making sustainability and climate issues mandatory, requiring all students to complete a certain number of courses on the topic. As institutions put stronger emphasis on sustainability in their curriculum, this will add pressure to ensuring that faculty are adequately prepared to teach these topics. Institutions are also facing other challenges, especially financial ones. Sustainability requires resources that may be hard to come by. To combat this, more institutions are forming multi-institution collaborations and pooling resources from local, regional, and state sources to address climate, energy-efficiency, and economic-development goals. And while going green requires upfront funding, fully investing in a sustainable campus could help save significant money in the long run. As institutions move forward, they should consider completing climate assessments so that they can strategically identify high-consumption areas that should be targeted in their pursuit of carbon neutrality.

Evidence: The University of California at San Diego recently announced that it will require students to complete at least one climate-change course to be eligible for graduation. The Sustainable Development Solutions Network partnered with the Climateworks Centre at Monash University, Second Nature, and the Alliance for Sustainability Leadership in Education to develop Net Zero On Campus, a guide for universities and colleges to accelerate climate action.

Concerns about the impact of big data tools on the environment are rising.

Impact: The use of big data (especially thanks to machine learning and AI) continues to be on the rise globally. Many recognize the utility—large quantities of data can not only help individuals identify relevant patterns or trends but also be used to address a range of issues including work processes, health care, and climate change. Yet, while big data is highly valuable, its rapid growth is causing some to become concerned about its impact on the environment. The amount of data created and stored globally continues to grow, putting increased pressure on data centers, which require huge amounts of energy and water. As institutions collect more data and rely increasingly on AI-powered technologies, they will need to devise plans that will help them adopt new technologies and collect meaningful data in a way that is sustainable and environmentally friendly. This means there will be an increasing need for support and tools that universities and colleges can use to accurately estimate and monitor their data-related carbon emissions, in addition to the development of a standard set of best practices and guidelines when it comes to making data greener—for example, guidelines for machine learning model development and training, and model use and re-use. As part of this, there will also be a growing need for transparency in developing machine learning models so that users can accurately estimate their emissions. Some universities and colleges are already finding ways to reduce their data emissions, for example by moving their data processes to eco-friendly data centers. Moving forward, institutions should look to work more closely with technology companies, not only as a means of better understanding their own data emissions but also

to forge pathways to sustainable data solutions that will meet the needs of higher ed institutions and their stakeholders. This also presents an opportunity for institutions to further expand their curriculum on sustainability. Students will need to develop literacy on the impacts of big data, responsible use of data-powered technologies, and creative and innovative methods for reducing data emissions.

Evidence: The University of York is planning to move most of the campus's advanced data calculations to EcoDataCenter in Sweden, reducing carbon emissions by about 98%. An article from Harvard Business Review proposes suggestions for how to make AI greener, including reusing and fine-tuning existing models, limiting the use of large models, and using approaches that are less computationally expensive.

The demand for green skills in the workforce is increasing.

Impact: Globally, the demand for green skills is growing, and this demand is quickly outpacing the talent being produced. Especially in the United States, we see the green skills gap continuing to widen, partly due to division in beliefs about climate change and its impacts. Yet it is predicted that most jobs will at some point require green skills, especially as more and more industries undergo a green transformation, along with a rise in the green economy. Already, many universities and colleges have started to implement climate change and sustainability into their curricula, but if they don't focus on making this training robust and applicable to all disciplines, we could see the green skills gap continue to widen, leaving students underprepared for the workforce. Institutions need to work on developing specialized, interdisciplinary, and cross-cultural degree programs to prepare students for the workforce in addition to exploring alternative forms of training for those seeking shorter-term, focused credentials. These changes need to be widespread and comprehensive because most industries will be impacted by a move toward sustainability, including health care, transportation, business and finance, energy production, and data and computing. Developing a curriculum centered around sustainability and climate change will be challenging because these issues impact all areas and industries. Universities and colleges will need to find ways to forge and support multi-institutional and cross-disciplinary collaborations and centers for learning, along with building an infrastructure that supports this collaborative work. The curriculum should extend beyond a focus on the occurrence of climate change and its noticeable effects to include solutions-focused training, which students are increasingly demanding. Institutions also face a major barrier in widely implementing green skills across disciplines because many faculty are not adequately prepared to teach these topics. More resources and people will be required to keep the curriculum up to date since these are rapidly changing areas. There will be a growing need to hire experts in addition to providing formal training opportunities for faculty. Even with this, it will be challenging for faculty to jump on board—many already have full plates and little time to devote to professional development and course revamps. Another obstacle involves emotions surrounding climate change—people, especially those in younger generations, increasingly grapple with climate anxiety. These negative emotions surrounding the uncertainty of the future and the impacts of climate change can impede not only students' ability to learn these topics but also faculty's ability to teach these topics. Thus, part of the curricular changes should include both formal and informal opportunities for students and faculty to learn to navigate these emotions so that they can be productive in their academic endeavors and later in their careers. Moving forward, institutions should forge partnerships with industry to better inform their curriculum and monitor workforce trends, in addition to finding ways to make time for faculty to engage in training and development opportunities and producing applied experiences and opportunities for students to use their green skills in realistic and engaging ways.

Evidence: According to the 2023 Global Green Skills Report, about 1 in 8 workers (globally) currently have one or more green skills, and "the demand for green skills is outpacing the increase in supply, raising the prospect of an imminent green skills shortage." Researchers at Stanford University and Suzanne Moser Research and Consulting recently developed recommendations for instructors and research mentors to enhance learning outcomes for those struggling with negative climate emotions such as climate anxiety.

FURTHER READING

QS World University Rankings
"Rankings released! QS World University Rankings: Sustainability 2024"

Nature
"GREENER Principles for Environmentally Sustainable Computational Science"

GreenBiz
"How Universities Can Help Fill the Climate Jobs Gap"

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 have significant effects on higher education at a variety of levels, both positively and negatively.

Political polarization in the United States continues to impact higher education.

Impact: Political distrust in the United States continues to drive polarization, and as politics seeps easily into daily life, Americans' sentiments are becoming increasingly negative, leaving many feeling exhausted and angry. Partisanship is driving division in beliefs over what the purpose of college should be, what the college experience should look like, and whether higher education can be trusted. As a consequence, we are seeing not only more attempts at government influence in higher ed but also increasing tensions on campuses, making it trickier for faculty and students to engage in meaningful and critical discourse and learning experiences. Academic freedom and freedom-of-speech cases continue to arise on campuses, especially surrounding hot-button topics including, most recently, the Israel–Hamas war. These tensions are increasingly causing leaders, faculty, and students to feel restricted in expressing their views and are sparking debates about whether universities and colleges should take a stance on social and political issues and whether faculty and students should bring their own social beliefs and political agendas into the classroom. With the looming (and already extremely controversial) 2024 U.S. presidential election on the horizon, we will likely see polarization and its impacts ramp up. It will be important for institutions to provide resources and opportunities for faculty and students to learn how to engage in meaningful conversations, not only with those who may have different mindsets but also to learn how to engage in civil and constructive dialogue on polarizing topics more generally. Institutions will need to do this carefully and thoughtfully to foster a climate where individuals don't feel like their academic freedom is being restricted and where faculty and students feel appreciated and included, regardless of their social identities or political leanings.

Another impact of political polarization is currently underway. People are increasingly choosing where to live based on the political climate, and faculty and students are interested in living in states with policies that align with their views on a variety of topics, including gun control, reproductive rights, immigration, DEI issues, and college entry testing policies. If this trend continues, college campuses could become less diverse, and polarization within higher ed could intensify as faculty and students gravitate to universities and colleges in areas that have more progressive or conservative climates, causing further separation between the two. In the future, higher ed institutions, most of which are looking to diversify their student bodies, may need to ramp up their efforts toward creating an authentic campus culture and climate that is nonpartisan, while still protecting individuals' rights and well-being.

Evidence: The University of Wyoming is taking efforts to stay politically neutral, recently releasing a new statement of principles that seeks to promote freedom of expression, intellectual freedom, and constructive dialogue. A growing number of universities and colleges are engaging in efforts to foster civil discourse and reduce polarization on campuses. In Virginia, a dozen institutions have partnered with the nonprofit Constructive Dialogue Institute to develop campus-wide initiatives. At American University, faculty and students are learning discourse skills via the Project on Civic Dialogue, which provides opportunities for faculty and students to practice engaging in dialogue skills.

Government policy is increasingly influencing education.

Impact: A variety of factors including political polarization, heightened social tensions, and an ever-changing higher ed landscape and student demographics are increasingly driving federal, state, and local government policy in relation to higher education. Legislative efforts to regulate teaching and campus initiatives stand foremost among recent concerns. Recently, this has included proposals for banning books; the teaching of sensitive topics surrounding race, gender, sexuality, and climate change; DEI initiatives; and the formation of student political groups. Although the number of these instances is growing, only a limited number have become law, with some states more forcefully pursuing such policies than others. Government influence also extends well beyond regulating teaching, impacting—perhaps to an even greater extent—areas such as admissions, funding, tuition, financial aid, and student loans, as well as the establishment and regulation of educational standards more broadly through attempts to force changes in accreditation. The impacts are far-reaching and varied. Campus climates

are becoming more tense as debates about academic and intellectual freedom continue and as institutions increasingly experience challenges in securing local and federal funding. Tuition, financial aid, and student debt continue to be convoluted areas to navigate as governments and institutions try to figure out ways to make higher education more affordable, with progress often being stalled by partisan division. All of these factors intersect to impact teaching and learning experiences. We've seen impacts on faculty and staff turnover, fluctuating student enrollments, and the perpetuation of the digital divide and other inequities. Moving forward, government regulations will continue to challenge and sometimes constrain institutions, which will face increasing pressure to comply with regulations while coping with already tight budgets and insufficient staffing levels.

Yet with more government policies directed at higher education, meaningful impacts on institutional operations and campus stakeholders are emerging. For example, universities and colleges are responding to concerns indicated by government policy initiatives by developing and/or revising institutional policies aimed at increasing transparency and institutional accountability (especially surrounding student financial aid issues); expanding financial aid for students; improving faculty, staff, and student retention; and improving student support and success (with a particularly strong and growing movement toward improving student readiness for the workforce). Moving forward, it's not certain what government legislation will be passed, especially with an upcoming U.S. presidential election. Regardless of the political affiliations and agendas that may be dominant in any given context, institutions and governments are likely to continue to focus on major issues such as increasing the value of higher ed to the individual student and society as a whole, improving higher education affordability and lowering student debt, and establishing standards and safeguards that promote student success. Universities and colleges must strive to improve civic literacy across society in general so that all segments of the population can collectively and critically make better decisions in relation to government policy. Institutions that want reform will need to be proactive and increase their efforts toward engaging with their stakeholders and communities to increase advocacy on these issues and better champion policies that promote equity, accessibility, academic freedom, and effective, research-driven pedagogy.

Evidence: As a result of the U.S. Supreme Court ban on affirmative action, some institutions implemented new admissions policies, such as guaranteed or direct admission, which forgo the application process altogether. The U.S Education Department put forth a federal rule aimed at increasing transparency about costs and risks associated with college programs. Under this rule, for-profit institutions, some nondegree programs, and most graduate programs will be required to "show that graduates can afford their yearly debt payments and are making more money than an adult in their state with a high school diploma and no postsecondary degree."

The need is growing for policies that address emerging technologies.

Impact: Over recent years, disruptive technologies have risen rapidly, particularly AI-powered tools, including generative AI. The speed at which these technologies have developed and continue to change makes it challenging to fully understand the potential risks and how to mitigate them. Yet most agree that there is a growing need for policies that address emerging technology policies and regulations in order to safeguard users and promote ethical and responsible usage and outputs. According to a report by UNESCO, there are already a variety of potential risks associated with AI that must be considered, including inaccurate and harmful outputs, plagiarism and copyright infringement, data security and privacy threats, and a worsening of digital inequities. AI is not the only area where many see a growing need for regulation—all technologies have different risks and limitations that society must manage. Already, there has been movement at the federal level. In May 2023, the Biden-Harris administration released the federal government's National Standards Strategy for Critical and Emerging Technology (Strategy), which prioritizes the development of standards for a variety of technologies, including communication and networking technologies; semiconductors and microelectronics; AI and machine learning; biotechnologies; positioning, navigation, and timing services; digital identity infrastructure and distributed ledger technologies; clean energy and storage technologies; and quantum information technologies. Globally, findings suggest that many countries are currently similar in their development and adoption of policies, with most currently focused on how to shape the development of AI use (i.e., countries are creating regulatory sandboxes, voluntary standards, and oversight bodies). It remains to be seen how quickly formal, mandatory policies will develop and what their direct impact on higher education will be. Some potential impacts include an increase in difficulty procuring technologies, in addition to difficulty navigating partnerships with third-party vendors; a stifling of creative and innovative uses and the development of new technology; increasing need for cybersecurity, privacy, and compliance resources and personnel; increasing feelings of distrust and concern about censorship and intellectual freedom; and a growing need for universities and colleges to

double-down on digital literacy so that users can be informed and make responsible decisions about their use of emerging technologies. In the meantime, while governments make progress with their policy efforts, however haltingly, institutions are implementing their own policies and should continue, which includes implementing processes for regular review and revision in the face of ongoing technological progress. As part of such efforts, they should strive to ensure that their policies keep pace with standards and practices across the nation and internationally, which entails supporting ongoing open discourse with all stakeholders so that they can best inform practices. Institutions should also strive to anticipate major policy and regulatory trends and outline contingent steps that the institution might take if relevant laws or regulations do take effect so that they can respond with agility and flexibility.

Evidence: Europe recently agreed to landmark rules for using AI. The EU AI Act is the first major regulation specifically targeting AI and could become a blueprint for other governments. "Government Technology" provides a regularly updated list of generative AI policies and guidelines that are being implemented by cities, states, and organizations across the nation.

FURTHER READING

Washington Post
"Political Polarization Is Sorting Colleges into Red and Blue Schools"

Chronicle of Higher Education
"Who Should Shape What Colleges Teach?"

Governing
"How Should Government Regulate Emerging Technology?"

HONORARY TRENDS: ARTIFICIAL INTELLIGENCE

This year, we include an honorary section devoted to artificial intelligence. AI continues to make waves not only within higher education but globally, across industries and in everyday personal and social contexts. The influence of AI is far-reaching, and perhaps unsurprisingly, panelists this year nominated at least one AI-related trend in each of the five trend categories. In this section we briefly highlight a few of the AI-related social, technological, economic, environmental, and political trends and impacts that are taking shape.

Social Trends

AI is changing the way we communicate. AI is being used more and more in human interactions and conversations, and discussion is increasing about the ways in which AI may shape not only human communication but, more broadly, socioemotional skills. Increasingly, people are not only using AI to facilitate communication but also conversing directly with AI (e.g., via chatbots or virtual assistants, and some are turning to generative AI as conversation partners). AI has the potential to change human connection and communication in a number of ways. As a result, higher ed will need to understand the evolving ways in which faculty, students, and staff are using AI and prepare to adapt to changes in the way students communicate. They will also have to update curriculum involving socioemotional skills and communication to account for these changes. Below are several ways that AI could impact communication and socioemotional outcomes:

- Cause others to have negative perceptions of you
- Change the norms for what's deemed to be appropriate when conversing with others
- Distort individuals' sense of self and others
- Cause people to behave more like machines
- Hinder social skills in young people and neurodiverse individuals
- Help individuals with communication disabilities to better communicate
- Facilitate and hinder the learning and use of foreign languages
- Improve communication within organizations
- Exacerbate loneliness

Technological Trends

AI tools have growing potential to reshape pedagogy and student experiences. When ChatGPT burst onto the scene, it grabbed the attention of faculty and students globally. Since then, there has been great concern over the use of generative AI in the classroom, especially in the realm of course assessments and plagiarism. Yet AI tools are not only growing more sophisticated—they are expanding beyond just assessments. More and more uses for AI in the classroom are emerging, and these technologies have the potential to change the landscape of teaching and learning and the student experience in a variety of ways, for better or worse. As these technologies continue to change and as adoption increases, higher education institutions will have to regularly update their recommendations and guidelines regarding the use of such technologies, paying close attention to proposed government policies that may be implemented in the near future. Institutions can also help their faculty and students be more mindful and responsible users by providing digital literacy training and resources and by finding ways to leverage AI to enhance pedagogical experiences and student outcomes. Below are several ways that AI could impact pedagogy and the student experience:

- Pave the way, through multimodal and interactive AI, for much more sophisticated and responsive educational technologies
- Shape the future of critical thinking
- Facilitate ideation and creativity
- Boost student engagement
- Improve classroom management
- Reshape the approach to assessments
- Personalize learning
- Act as tutors and provide feedback to students
- Enhance LMS platforms
- Help with student mental health

Economic Trends

AI is increasingly having an impact on the economy and workforce. Organizations of all kinds are adopting AI technologies, and many are speculating about what the impact will be on them, the workforce, and the overall economy. AI has the potential to significantly change the way individuals work, with many feeling optimistic that AI will help boost productivity by automating mundane and time-consuming tasks and thereby freeing individuals to work on more critical tasks. Others worry that AI could have a negative effect on the workforce and economy by leading to the loss of millions of jobs. Higher education institutions will need to prepare to navigate the incorporation of AI into their own business models and workflows, as well as to align their programs to prepare students for the changing workforce. They can accomplish this, for example, by teaching students digital literacy skills and helping them assess career pathways based on workforce changes stemming from AI adoption. Below are several ways that AI could impact the economy and workforce:

- Lead to an economic boom
- Improve productivity
- Replace jobs in the future
- Lead to the creation of new jobs in the future
- Change business models and strategies
- Change the skills needed in the workforce
- Advance skills-based hiring
- Impact workplace diversity

Environmental Trends

AI is increasingly being used to address climate change and sustainability issues. The continued development of powerful AI tools has provided new ways to address global issues, including environmental ones. Now, AI can help not only detect and monitor climate threats and change but also combat climate change and increase sustainability. Higher education institutions can further their commitment to sustainability by exploring AI-powered technologies that could help reduce emissions and energy consumption on their campuses. Yet they will need to be mindful that the use of AI technologies, including those designed to address climate change, also have a growing carbon footprint. The growth in environmental AI technologies also presents an opportunity for universities and colleges to offer interdisciplinary curriculum in which students can increase their emerging technology competencies and green skills, both of which will be needed for the workforce. Below are several ways that AI could impact the environment:

- Forecast sources of renewable energy
- Power renewable energy systems
- Help farmers grow climate-resilient crops
- Detect methane emissions and forest fires
- Combat climate change
- Add to global carbon emissions and higher energy consumption

Political Trends

The potential for the use of AI in politics is growing. AI is already being used by governments to tackle issues in health care, transportation, and the environment. AI is also being used to aid political campaigns and elections, in addition to making its way into policy and legal arenas. We are still at an early stage, however, when it comes to government policy and regulations on emerging technologies such as AI. This is sparking debates about a number of risks and associated safeguards that may need to be implemented. As AI technologies increasingly impact the political environment, higher education institutions should be prepared to increase their political and information-literacy efforts, providing regularly updated resources and training, not just for students but for faculty and staff alike. The emergence of AI in civic life may also provide institutions with an opportunity to develop more curriculum on trust—both political and technological—as the increasing use of AI in politics may further perpetuate trust issues toward governments and AI. Below are several ways that AI could impact politics:

- Generate propaganda that is as persuasive as real content
- Exacerbate the generation and dissemination of misinformation and deep fakes
- Generate political content (and some companies will require disclosure of such AI generation)
- Administer elections
- Disenfranchise voters
- Create robocallers (bots that engage with voters)
- Be used by the government
- Write laws
- Be used in legal rulings
- Strengthen and weaken democracy

KEY TECHNOLOGIES & PRACTICES

The *Horizon Report* describes "key technologies and practices" that are anticipated to have a significant impact on the future of teaching and learning in light of the social, technological, environmental, economic, and political trends previously identified by the panel. In the nomination and voting process, panelists consider which technologies or practices have the most potential to either mitigate or accelerate these trends.

We include both technologies and practices because we know that while innovations and advancements in technological capability create new opportunities, it's often the pedagogical practices or the development of institutional capabilities that offer the most potential as change drivers.

In recent years, a shift from discrete technologies toward more holistic practices or combined approaches to technology use has occurred. In this 2024 report, while we see references to specific technologies—namely artificial intelligence—this set of "technologies and practices" reflects this shift toward the practices needed to maximize potential or minimize risk in a world where digital experience is increasingly threaded through both personal and academic experiences.

Related to AI, the panel called out the need to find appropriate uses for AI-enabled technology and to support AI fluency. Generative AI tools are increasingly powerful and readily available to students, faculty, and staff, and these stakeholders will need to negotiate questions about what responsible use in higher education looks like. Similarly, supporting AI fluency will help stakeholders understand what AI is and what it is not, how to leverage these tools to support meaningful teaching and learning experiences, and how to navigate potential issues of bias or ethics.

Themes of recognizing the whole person in students and other stakeholders also come through in the key technologies and practices. Supporting mental health and supporting equitable and inclusive learning have appeared indirectly in previous Teaching and Learning editions of the *Horizon Report*; however, both were called out this year more explicitly than ever before.

Panelists also noted two areas specific to mitigating risk: navigating misinformation and protecting data privacy and security. While navigating misinformation is an issue society has long grappled with, identifying and responding to misinformation is becoming increasingly difficult with the proliferation of social media and powerful AI tools. And as higher education becomes increasingly digitized, attention to digital security becomes critical to ensure the safe and effective use of educational technology tools.

In this section, readers will find an overview of each key technology or practice, ideas for action, and a set of resources for further reading. Examples of projects that bring each technology or practice to life are also included with brief descriptions and links to learn more. In this edition, we also include additional project examples in the Appendix.

FINDING APPROPRIATE USES FOR AI-ENABLED TECHNOLOGY

Overview

Faculty and staff can use AI tools to support student learning. As one panelist explained, students can "learn to apply AI for all phases of learning in Bloom's hierarchy, from content and competency acquisition to generation of original products that blend human and machine insights." However, there is still a lack of widespread agreement among higher education stakeholders about what constitutes appropriate use of AI-enabled technology for teaching and learning. Questions around the ethical use of AI, the role of AI in the generation of new knowledge, and the relationship between human and AI outputs remain largely unanswered. Faculty, staff, and students will need to work together in the coming years to decide how they want to integrate (or not integrate) AI-enabled technology into teaching and learning.

> ***"Finding appropriate uses for AI-enabled technologies is one of the core, fundamental ways that higher education stakeholders can help shape how AI tools are used for teaching and learning while also setting the tone for how people on the inside and outside of postsecondary education think and feel about those tools."***

Along with great potential, AI tools bring great risk. For example, unchecked biases can be amplified by AI, reinforcing and exacerbating systemic inequity. Data privacy and security are also central concerns. More AI-enabled applications being used at institutions means more data are being collected and stored, oftentimes by cloud-based services. Some of the policies and guidelines in place at most higher education institutions might be sufficient to address these risks, but new policies and guidelines certainly need to be created in response to new use cases.

Taking Action

Be cautiously optimistic, staying aware of risks and pitfalls. Though those in the higher education community are mostly optimistic about the potential for using AI tools to support teaching and learning, they are also aware of the many risks associated with the technology. Just some examples of these risks include equal access to AI tools, accuracy of outputs, interpretation of outputs, algorithmic bias, social bias, academic integrity, intellectual property, environmental impacts, and data privacy and security.

> ***"While AI introduces complex challenges, higher education stakeholders have an opportunity to develop ethical frameworks, policies, and practices to deploy these technologies in socially responsible ways."***

Use AI-enabled technology to improve human work, not replace it. One panelist wrote, "Creativity, empathy, love, and humanity will not be replicated or displaced by AI." Teach students how AI can assist them in making a job better rather than entirely taking over tasks. Integrate apps that facilitate personalized learning and student support services.

Connect with colleagues. Finding appropriate uses for AI-enabled technology requires collaboration within and across areas of expertise and academic disciplines. Seek resources such as faculty-led showcases, peer networks, special-interest groups, and panel presentations to learn what colleagues are doing and to share your own work.

Think outside the box. AI-enabled capabilities have already been part of the learning environment in tools such as adaptive learning technologies. As AI advances, consider new applications such as assistive technologies, academic coaches, and workforce-related tools.

Consider revising pedagogical elements. As faculty uncover new uses for AI tools in the classroom, some pedagogical elements might become outdated. If you find that an AI tool can easily accomplish an assignment without human involvement, consider revising the assignment to focus on the important human-learning objectives.

> ***"We are on the cusp of a paradigm shift in higher education; the incorporation of AI is going to change virtually all our standard practices in higher education."***

Finding Appropriate Uses for AI-Enabled Technology in Practice

AI-Enhanced Instructional Design

A team of graduate students at the University of Saskatchewan coauthored an open textbook featuring practical examples of AI's role in transforming instructional design. The textbook explores AI applications that can generate high-quality course content, foster creativity, personalize learning, and drive innovation to enhance student learning experiences. Across the 18 chapters, the authors underscore the need for AI literacy within educational environments, emphasizing our collective responsibility to guide the ethical and responsible use of AI-enabled technology.

Teaching as Research: Supporting Faculty to Experiment with Generative AI in Their Courses

A systems-thinking application of institutes, fellowships, learning communities, and teaching-as-research consultations provides Carnegie Mellon University instructors with strategies, tools, and support to innovate with generative AI and collect data from courses. Cohorts of instructors develop educational research skills and implement rigorous study designs on AI applications and student outcomes. As instructors adopt inclusive and impactful strategies and disseminate lessons learned, evidence-based teaching is cultivated at scale.

Engaging AI Formative Practice to Transform Foundational Teaching and Learning

Faculty at the University of Central Florida and Iowa State University partnered with VitalSource to research the use of AI-generated formative practice in courseware and e-textbooks. This technology gives students a highly effective learning-by-doing approach, provides faculty with data insights, and shifts teaching and learning to better use primary learning resources. Research has validated the efficacy of AI practice and its benefits to student engagement and learning.

Emerging Technologies Faculty Learning Community

The Emerging Technologies Faculty Learning Community (FLC) at Saginaw Valley State University consists of eighteen faculty members studying the impact of artificial intelligence in higher education. Throughout the academic year, the FLC will explore how to update teaching methods, course designs, and curricula in response to AI advancements. Each participant is working on a practical project, such as course redesigns, new assignments, curricular proposals, or resources for peers.

AI-Intensive Writing, Research, and Inquiry Pilot Courses

This Boston University project provides a structured, real-world context in which to explore the ramifications of generative AI for student learning in first-year writing courses by (1) inviting students' engagement with GAI in their coursework, (2) providing students ChatGPT-4 subscriptions, and (3) embedding in each pilot section an undergraduate AI affiliate who collaborates with the instructor on GAI learning activities and supports students in practicing ethical and meaningful AI-mediated writing and research.

FURTHER READING

The University of Sydney
"How Sydney Educators Are Building 'AI Doubles' of Themselves to Help Their Students"

Computer and Education: Artificial Intelligence
"AI-Enabled Adaptive Learning Systems: A Systematic Mapping of the Literature"

Texas Computer Education Association
"A Teacher Rubric and Checklist for Assessing AI Tools"

Thompson Rivers University Library
"Artificial Intelligence: A Guide for Students"

Harvard Business Review
"13 Principles for Using AI Responsibly"

World Economic Forum
"How Can AI Support Diversity, Equity and Inclusion?"

Chronicle of Higher Education
"How Will Artificial Intelligence Change Higher Ed?"

EDUCAUSE Review
"Integrating Generative AI into Higher Education: Considerations"

SUPPORTING AI FLUENCY

Overview

All higher education stakeholders will benefit from learning how to use AI responsibly. As one panelist remarked, "AI fluency is rapidly becoming an essential sub-skill within the broader scope of digital literacy." With the appropriate knowledge and skills, faculty can use AI tools to support and improve teaching and learning, and students can focus on engaging in meaningful learning experiences. Thus, institutions are beginning to focus on supporting AI fluency to equip students, faculty, and staff with the knowledge needed to think critically about AI. Stakeholders need to understand what AI is and how it works, and they also need to be able to use it effectively.

> ***"AI is our new internet or World Wide Web. It's a complex, ubiquitous technology that requires ongoing study and engagement to manage and to responsibly and creatively deploy."***

Supporting AI fluency is essential for institutions to mitigate AI-related risks. For example, AI users should understand the biases that can be amplified by AI tools so that they can spot those biases in outputs. Similarly, understanding the limitations of AI-sourced insights will help individuals evaluate the utility of AI outputs for data-informed decision-making. Still, supporting AI fluency comes with its own risks. Developments in AI technology are so rapid that institutions might find their training programs quickly outdated. AI-related professional development might also cause stakeholders to feel pressured to integrate AI technologies in ways with which they do not feel comfortable. AI-related professional development should be designed to be responsive to rapid technology developments and inclusive of all stakeholders' viewpoints and expertise.

Taking Action

Embrace curiosity. All individuals in the higher education community can support their own AI fluency by embracing curiosity. Experiment with AI tools on your own, and seek peer learning opportunities such as roundtable discussions and self-paced courses.

> ***"We can't teach with or about something we don't use. Treat [AI] as a new tool with new strengths and weaknesses, and explore it."***

Create policy and infrastructure as needed. Initial reactions to the proliferation of generative AI tools in higher education have focused on academic integrity concerns. However, policy must be expanded so that it is aligned with the full range of potential AI uses. Leverage existing policies and guidelines as much as possible, and align new policies and guidelines to the overall mission, vision, and values of the institution. Communicate with students about policies and guidelines that impact them.

Invest in professional development for faculty and staff. Leveraging AI effectively will require new skills for faculty and staff. Beyond pedagogical practices, faculty and staff will also need training related to data privacy and security and ethical data governance, especially as institutional policies evolve to include more AI-related use cases.

Collaborate with industry partners to understand workforce applications. AI fluency will be an essential skill for students entering or advancing in the 21st-century workforce. However, tracking emerging applications of AI tools in the workforce is challenging for educators. Thus, partnerships between higher education and industry will be critical for designing curriculum aligned with cutting-edge workforce skills.

> ***"Student AI fluency will be critical for workforce development. These skills need to be embedded in discipline-specific courses as well as general education courses."***

Center ethics, transparency, and accountability. AI-related professional development must help users identify appropriate strategies for mitigating risks. Though the field is still working to reach widespread agreement about what constitutes appropriate use of AI in the academy, there is general agreement that developers and users should center ethics, transparency, and accountability.

Supporting AI Fluency in Practice

Leveraging Artificial Intelligence with Communities of Practice and Teaching Across the Curriculum

Palm Beach State College received a federal grant to increase capacity and effectiveness in delivering instruction in industry-aligned skills in artificial intelligence technologies. This grant-funded initiative looks to increase PBSC faculty knowledge of AI and supports course revisions that incorporate AI concepts and applications. The grant is supported by the Center of Teaching and Learning Excellence (CTLE), and the goals are accomplished through education and professional development and training, with initial support provided through a partnership with the University of Florida.

Generative AI and Assessment: Design Principles for the Future of Teaching and Learning in Higher Education

The Generative AI and Assessment (GAIA) project has emerged from a mixed-methods study of the ways higher education instructors across Canada are responding to generative AI through student assessment practices. As part of this study, we have collected and made available sample assessments submitted by participants that either incorporate generative AI into student tasks/activities or attempt to limit the use of generative AI in productive ways.

AI Across the Curriculum

As part of its "Building an AI University" effort, which includes all disciplines and perspectives, the University of Florida is pursuing an AI Across the Curriculum initiative that promotes AI fluency on campus and beyond. UF strategically focuses on AI education through centralized leadership in the AI^2 Center, which includes the hiring and training of faculty; the creation of AI curricula, courses, and programs; and national professional workforce development.

PapyrusAI

PapyrusAI is an online platform developed at the University of California, Irvine, that provides students with Socratic personalized tutoring on their writing via a connection to generative AI. Students who use it improve their writing and AI literacy by engaging with a large language model in safe, scaffolded, pedagogically sound ways. Instructors can select what support their students receive, add their own prompts and rubrics, and receive detailed reports on students' writing development with AI.

Developing a Multi-Layer Capability Curriculum for AI Literacy

This project, coordinated by three New Zealand higher education institutions (academyEX, University of Canterbury, and AUT), addresses the urgent need for a curriculum framework for AI literacy that accounts for different capabilities for all levels of education. It is grounded in a Delphi study of AI experts who have developed an AI literacy framework that addresses concepts, applications, challenges, and transdisciplinary skills. This framework will inform future curriculum development that ensures all learners have fundamental AI competencies.

Empowering Student Innovation: A Students-as-Partners Project to Enhance AI Fluency

Xi'an Jiaotong-Liverpool University adopted a students-as-partners approach, positioning students as key contributors in designing an interactive course focused on AI fluency. Working alongside instructional designers, the students used AI and H5P technologies to develop engaging materials such as interactive books and branching scenarios. This initiative aimed to educate peers on AI technologies, ethics, and related policies, showcasing the students' creativity in making AI accessible and pertinent to their fellow learners.

FURTHER READING

Prospects
"The Optimistic Future of Artificial Intelligence in Higher Education"

University of California
Responsible Artificial Intelligence

WCET
"Developing Institutional Level AI Policies and Practices: A Framework"

Ethan Mollick
One Useful Thing

Philippa Hardman
Dr. Phil's Newsletter

TechTrends
"Prompting Change: Exploring Prompt Engineering in Large Language Model AI and Its Potential to Transform Education"

Harvard University
"Navigating A World of Generative AI: Suggestions for Educators"

ASCILITE 2023
"Identifying the Components of Foundational Artificial Intelligence (AI) Literacy — Early Results From a Delphi Study"

International Journal of Information Management
"The Ethics of ChatGPT – Exploring the Ethical Issues of an Emerging Technology"

World Economic Forum
The Future of Jobs Report 2023

SUPPORTING EQUITABLE AND INCLUSIVE LEARNING

Overview

Supporting equitable and inclusive learning is vital to higher education's teaching and learning mission. Looking at this year's trends, supporting equitable and inclusive learning becomes more important than ever as the higher education community continues to see changes to student demographics and a persisting digital divide. One panelist asserted, "Equitable [and] inclusive learning is excellent teaching!" Rich learning environments are built on relationships—between educators and students and between students. Cultivating equity and inclusivity leads to a safer community of educators and learners, improving students' entire learning experience. Further, fostering diversity across the institution creates an environment in which individuals can share varying opinions and broaden their understanding of the world.

Certainly, supporting equitable and inclusive learning has never been easy. Though stakeholders rarely disagree that higher education should be equitable and inclusive, they often disagree about ways to support those goals. Now, large-scale trends are presenting new challenges and risks. For example, with continued political polarization and increasing influence of government policy on education, public opinion on which facets of our identity matter and how institutions should support equity and inclusion is shifting. In some cases, existing institutional programming has been eliminated entirely. "The challenge," one panelist explained, "is moving beyond DEI as a buzzword and making it a truly integrated process."

Taking Action

Engage in self-reflection. Examining one's own biases is the first step to meaningful engagement in the work of equitable and inclusive learning. Self-awareness allows individuals to be more observant of systemic inequity and more open-minded to learn about other perspectives and experiences.

Review policies and practices with an equity lens. Rather than accepting the status quo, look for ways that formal institutional structures benefit some students more than others or even prevent some students from succeeding. Take a data-informed approach by disaggregating outcome measures (e.g., achievement and persistence), rather than assuming any particular group of students should be automatically considered at-risk due to certain identity characteristics or experiences.

Collaborate, collaborate, collaborate. Substantive progress toward an equitable and inclusive institution can only be made through collaboration. Reach across silos to coordinate top-down and bottom-up efforts and to integrate work being done in various functional units and academic disciplines.

Close the digital divide. In our digital society, challenges such as limited access to high-quality internet and lack of adequate hardware not only act as barriers to student learning but can also prevent students from preparing for and attaining 21st-century jobs.

Diversify teaching methods. Lean on frameworks such as universal design and culturally responsive pedagogy to create learning environments that offer each individual student personalized engagement opportunities. Use research-based pedagogies that are proven to serve diverse groups of learners. Seek professional development opportunities that emphasize using a variety of teaching methods to support diverse student bodies.

Use inclusive hiring practices. Inclusive hiring practices lead to greater diversity among faculty and staff. This diversity allows educators to draw from a broader range of experiences and viewpoints to support more equitable and inclusive learning.

Reduce unnecessary costs. Consider low- or no-cost resources such as open educational resources in place of more expensive curricular material. Advocate for judicious spending and limiting student fees.

Supporting Equitable and Inclusive Learning in Practice

Inclusive STEM Teaching Project

The Inclusive STEM Teaching Project is a free, open, online course and associated optional local learning communities developed by a cross-institutional team that demonstrably advances the awareness, self-efficacy, and ability of STEM faculty, postdocs, graduate students, and staff to cultivate inclusive learning environments for all their students and to develop themselves as reflective, inclusive practitioners. Through six course runs, 11,240 participants have engaged with a completion rate over 25%. We have trained 464 facilitators at 135 institutions that lead local learning communities. We work across all higher education, including community colleges, comprehensive liberal arts institutions, and research universities.

N-TUTORR: Transforming Learning in Irelands' Technological Higher Education Institutions

Seven institutions are collaborating on the N-TUTORR program, which is built on six themes: academic integrity; digital transformation; education for sustainability; universal design for learning; equality, diversity and inclusion; and employability. This project includes four streams of work: empowering students; developing staff capabilities; building an inclusive digital ecosystem; and securing progress and sustaining impact.

LibreTexts

LibreTexts is the adaptable, user-friendly open education resource platform that educators trust for creating, customizing, and sharing accessible, interactive textbooks, adaptive homework, and ancillary materials. We collaborate with individuals and organizations to champion open education initiatives, support institutional publishing programs, drive curriculum development projects, and more.

The Immersive Classroom from the Harvard Division of Continuing Education

The Immersive Classroom is a supercharged video player that allows students in HyFlex courses to participate asynchronously in activities from live classes. It uses smart technology to auto-generate discussion boards, creating the illusion that the platform works by students and instructors interacting with each other through the recording. It encourages equitable asynchronous participation by seeding video comments with the live Zoom chat so no asynchronous student needs to comment first.

Sensory-Friendly Libraries

The Pennsylvania State University Sensory-Friendly Libraries Project harnesses technology to help students manage sensory input. Neurodivergent students, as well as students with trauma and anxiety, face campus environments riddled with sensory challenges that interfere with their studies and mental health. Our goal is to nurture inclusive learning by giving students access to sensory rooms and kits that help them personalize sensory experiences so they can concentrate and feel well.

Inclusive Online Learning Environments: A National Collaboration to Support Online DEI for All

Diversity, equity, and inclusion (DEI) experts, higher education instructional/learning designers, and online teaching faculty from SUNY, the Center for Effective Teaching and Learning at Cal State LA, and California Community Colleges, along with individual contributors from over 60 institutions, have developed an openly licensed and freely available framework that integrates DEI practices into any online course quality rubric to help institutions, online instructional designers, and online faculty ensure inclusive, high-quality online course designs.

FURTHER READING

Thomas J. Tobin and Kirsten T. Behling
Reach Everyone, Teach Everyone

UNESCO
"Disability Inclusive Education: A Call to Action to Ensure Inclusive and Equitable Quality Education"

Zaretta Hammond
Culturally Responsive Teaching and the Brain

James M. Lang
Small Teaching

Harvard University
"Equitable & Inclusive Teaching"

EDUCAUSE Review
"29 Practical Actions for JEDI Leaders"

The University of Kansas
"Designing with Equity and Access in Mind"

Arizona State University
"Does Access Translate to Accessibility?"

The Student Success Collaborative
DEI Collaborative

PROTECTING DATA PRIVACY AND SECURITY

Overview

Protecting data privacy and security is a crucial responsibility for higher education institutions on multiple fronts. Data breaches have the potential to interrupt the entire institution's operations, and regulatory and compliance requirements hold institutions accountable for safeguarding personal and institutional data. Perhaps more importantly, institutions have an ethical responsibility to protect students, staff, and faculty from malicious actors. As higher education increasingly uses remote modalities for learning and work, cloud-based software, and AI tools, data privacy and security will be even more consequential. Though protecting data privacy and security is not always included as a teaching and learning topic, the digital teaching and learning environment is amplifying the importance of integrating privacy and security into daily teaching practice.

Protecting data privacy and security is a complex task that requires buy-in and coordination from stakeholder groups across the institution. For some institutions, the first step is building basic infrastructure around data governance, an endeavor that requires significant time and budget. Working to effect any sort of change at scale runs the risk of overwhelming faculty and staff. Shoring up privacy and security processes also introduces risk related to over-protecting data, potentially limiting access for stakeholders engaging in important research and evaluation. Privacy and security professionals can mitigate this risk by helping institutional leaders align processes to the institution's mission, vision, and values.

> ***"The safer data and security [are] for all, and especially students, the more we can effectively and safely use educational technology tools for teaching and learning."***

Taking Action

Foster a culture of data privacy and security across the institution. Create clear privacy and security policies and guidelines, ensure that all individuals understand their role in protecting data privacy and security, and provide adequate training for faculty, staff, and students. Help students understand the importance of privacy and security for their personal and professional lives.

Limit the data collected and stored by your institution. Only collect data that will be used for educational purposes, and deidentify those data whenever possible. Be transparent with students about what is collected and how it is used, and give students the appropriate level of control of their data (i.e., the ability to opt in or out of data collection and analysis).

Revise and create policies and guidelines to fit AI use cases. In many cases, existing privacy and security policies will be adequate to address AI-related concerns, but institutions will likely need to revise at least some existing policies and guidelines as well as create new ones. Work with privacy and security professionals at your institution to shed light on use cases relevant to teaching and learning.

Model good privacy and security practices for students. Faculty and staff can not only provide direct instruction and training for students but also model good practices such as protecting personal information and discussing the privacy and security of third-party software.

> ***"Faculty can teach students how to have a healthy distrust of technology and an eye for suspicious materials."***

Make privacy and security a foundational element for procurement. Whether you're investigating the use of a tool for one class or for the entire institution, be critical of data privacy and security, and consult with your institution's privacy and security professionals. Continue to monitor changes to terms and conditions to ensure that the tools you are using are still protecting your information.

Protecting Data Privacy and Security in Practice

City Smart, Cyber Smart: An NYU Cybersecurity Awareness Campaign

The City Smart, Cyber Smart campaign gives New York University students, faculty, and staff clear, actionable guidance on steps they can take to improve cybersecurity, grounding cybersecurity theory in real-world experience. It was deployed via email newsletters, digital signage across campus, social media, and a support website.

Digital Shred Privacy Literacy Initiative

The Digital Shred Privacy Literacy Initiative at Pennsylvania State University is a national, award-winning project to support educators in designing and delivering evidence-based, theory-informed privacy literacy learning experiences. The Digital Shred Toolkit is an actively curated collection of privacy-related teaching materials, how-to's and toolkits, and case studies for classroom implementation, along with current awareness resources, scholarly research, and professional documentation to nurture practitioners' content knowledge and self-efficacy.

UC Berkeley Web Application Security Testing Program

The UC Berkeley Web Application Security Testing Program is a partnership between Berkeley's Information Security Office and the School of Information's Master of Information & Cybersecurity (MICS) program. The program is a practicum that teaches students cybersecurity skills and allows them to put those skills to practice by conducting offensive security testing (attackers' point-of-view) against real-world Berkeley applications.

Governing Teaching & Learning Data: Using a Privacy and Transparency-Centric Framework to Support Learner Success

UW–Madison has instituted a comprehensive data governance program structured to ensure that expertise and accountability are in place to uphold commitments to protect individual privacy, assure data security, and deliver transparency. A dedicated focus on teaching and learning activity data (including the use of digital tools) enables tailored messaging, processes, and practices to account for the unique challenges arising in this area, which differs sharply from administrative realms.

Licensing Privacy

This University of Illinois project seeks to use the power of library licensing agreements to effect change in third-party platform practices to bring them into alignment with library values of privacy, confidentiality, and respect for user control over their own data.

FURTHER READING

EdTech
"Protecting Both Privacy and Security in Higher Ed"

U.S. Department of Education
Protecting Student Privacy

Dataversity
"Why Mature Data Governance Is Essential for Data-Driven Diversity, Equity, and Inclusion (DEI)"

National Cybersecurity Alliance
"Securing Higher Ed: 5 Tips for Learning Safe Online"

CPO Magazine
"Enhancing Higher Education Security: The Role of Security Service Edge"

National Law Review
"Workplace Diversity, Equity, Inclusion: Data Privacy and Security Issues"

Lexology
"Data Protection in Higher Education: What to Expect in 2024"

University of Wisconsin–Madison
Generative AI @ UW–Madison: Use & Policies

World Economic Forum
Global Cybersecurity Outlook 2024

NAVIGATING MISINFORMATION

Overview

The proliferation of misinformation is a long-standing social concern. Learning to identify and navigate misinformation is only becoming more challenging due to social media and AI-generated content. Teaching students how to navigate misinformation helps them act as responsible members of the digital society and supports their development of critical thinking skills and information literacy. Further, in an increasingly polarized political environment, students need to be able to navigate misinformation to have productive conversations and make informed decisions. Knowing how to navigate misinformation is also challenging because it requires proficiency in multiple skills: identifying and verifying trusted sources, finding and evaluating varied perspectives, seeking peer reviews, verifying citations, and pausing to reflect on new information rather than jumping to action.

> ***"A vital part of teaching and learning is giving individuals opportunities to question common knowledge. Offering practical experience in interrogating knowledge to determine what is 'true' and how we collectively agree on it is core to education."***

As vital as navigating misinformation is, it comes with some clear challenges and risks. A central tenet of the academy is freedom of thought and expression. When done correctly, teaching students to navigate misinformation should not impede those freedoms. However, public perception may not align with intention. That is, institutions risk being perceived as supporting censorship and knowledge gatekeeping when teaching students to identify misinformation. It may also be challenging for institutions to devote sufficient resources to upskill faculty, staff, and students rapidly enough to keep up with rapid advancements in the generation and proliferation of misinformation.

Taking Action

Embed instruction about misinformation directly into the curriculum. Demonstrate how to have healthy suspicion and think critically about arguments. Teach students to identify rhetorical techniques, logical fallacies, and biases. This approach will help students apply critical thinking skills in the context of their discipline.

Include instruction about misinformation in institution-wide courses, such as first-year seminars. Navigating misinformation is an institution-wide mission that requires coordinated efforts and both top-down and bottom-up support. Institution-wide courses addressing misinformation will help faculty and staff reach more students and reach them earlier in their college careers.

Use real-life examples to teach students how to navigate misinformation. Students need to be able to evaluate information from a variety of sources, such as news outlets, social media, search engines, and generative AI tools. With factual examples, students will be able to learn how misinformation impacts their learning, work, and life.

> ***"Higher education is uniquely positioned to foster civic digital literacy and model responsible ways to navigate the polluted information ecosystem."***

Seek professional development related to digital literacy, including navigating misinformation. The digital world is constantly changing. Resources such as peer networks and special-interest groups can help faculty and staff stay informed about the latest challenges and strategies for navigating misinformation.

Work with librarians. Teaching students information literacy is a vital library function. Librarians at your institution might offer digital literacy workshops and other programming that includes skills for navigating misinformation.

Stay cognizant of the subjective nature of "truth." Teaching students about misinformation means teaching students to evaluate truth. Faculty and staff may be subject to their own echo chambers, which could introduce false confidence in unexamined claims of truth. The key is integrating multiple perspectives and finding balance between objective facts and subjective interpretations.

Navigating Misinformation in Practice

Misinformation Exposed: Documenting Truth in the Digital Landscape

"Blurred Line: Documenting Truth in Info & Media" is a transformative course at the University of Virginia delving into the complexities of information discernment in today's digital landscape. With a blend of theoretical foundations and hands-on exploration, students develop critical thinking skills to identify disinformation and misinformation. Through engaging discussions, readings, and projects, the course tackles issues of equality, ethics, and media empowerment. The course culminates in a documentary project in which students apply their learning to tackle real-world misinformation challenges head-on.

Data Fluencies Project

The Data Fluencies project investigates the impacts of misinformation on society by developing analytical techniques from arts and humanities with tools from data science. The project brings together groups already working on the same problems, including social justice movements, Indigenous researchers, technology developers, theatre and exhibition producers, and instructors from all levels of education. The project is also developing teachable materials for training future scholars on data fluencies.

Designing Live Learning Compasses to Navigate Disinformation

This project disseminates content through YouTube, inviting viewers to try to understand authors and sections of books. The work fosters a critical and reflective perspective, encouraging researchers to use such dissemination as a resource against misinformation and capture the attention of other content that condemns freedoms and argued opinions. Unlike proposals that rely on visuals or editing to entertain, this proposal invites academics to generate live spaces to interact on topics in a respectful and critical manner in the face of current trends.

The For-Against-Neutral Video Assignment

The For-Against-Neutral Assignment was designed in partnership between instructional technologists and librarians at the College of Saint Benedict and Saint John's University. This assignment is a single-session video-editing exercise to introduce aspects of information and media literacy. Students are divided into groups and given historical news content and an assigned angle to selectively edit a video together that advocates "for, against, or neutral" to the topic. The session concludes with students voting to guess the angle of each video.

FURTHER READING

Stanford University
"It Doesn't Take Long to Learn How to Spot Misinformation Online, Stanford Study Finds"

Higher Education Policy Institution
"The Role for Higher Education in Combatting AI Misinformation"

Harvard University
Managing Misinformation

University Business
"How to Build Data Literacy to Help Students Navigate Misinformation"

College & Research Libraries
"Preparing College Students for a Digital Age: A Survey of Instructional Approaches to Spotting Misinformation"

Association of College & Research Libraries
Framework for Information Literacy for Higher Education

SUPPORTING MENTAL HEALTH

Overview

All members of the higher education community will benefit from supports for mental health. At a time when the higher education workforce is consistently struggling with burnout, prioritizing workforce mental health allows faculty and staff to be happier and more effective employees. Supporting student mental health enables students to bring their best selves to their learning experiences, ultimately learning more. One panelist explained, "The trends of changing student demographics and increased demand for learning anytime, anywhere make supporting mental health a challenge. If we don't have a typical, predictable student population in a typical, predictable place at a typical, predictable time, then how do we best support mental health?"

> ***"Mental health and wellness underpin our approach to everything in life."***

At many institutions, mental health resources are already stretched thin. As demand for mental health services increases, funding and staffing do not. Creating or expanding mental health resources for faculty, staff, and students requires specialized training, time, and money that institutions simply don't have access to. For these reasons, faculty and staff who work directly with students may be called upon to take a role in addressing student mental health. However, faculty and staff are not always equipped with the specialized mental health training they need. Institutions can contend with these challenges by offering all faculty and staff ongoing mental health–related professional development and tools that help foster mindfulness and well-being.

Taking Action

Take good care of your own mental health first. As one panelist pointed out, "We're human with limited energy and resources. And that can lead to burnout." As you work to support students, keep an eye out for compassion fatigue, and reach out for help when you need it.

Use flexible policies whenever possible. Flexibility can be built into courses and institutional policies to support mental health. Flexibility in the pace of courses, learning modalities, and due dates can help students juggle all of their responsibilities and support their mental health. Flexible institutional policies can help students as well as faculty and staff.

Incorporate positive mental health practices and resources in the curriculum. Build in activities such as breaks in lengthy content, and proactively make students aware of other campus resources such as counseling. Include information about mental health services in syllabi.

> ***"Many of the practices that are supportive of mental health are also supportive of learning, and vice versa."***

Remove barriers to attaining accommodations. Many students do not seek accommodations for disabilities and mental health concerns because application processes are time-consuming and burdensome. Simplify processes as much as possible, and offer assistance to students who need help applying.

Promote work–life balance for faculty, staff, and students. Everyone at the institution, including students, should have manageable workloads so that they have time for other responsibilities and recreation.

> ***"Supporting mental health has become even more critical after the pandemic as many university members from all stakeholder groups are dealing with the impact of this time."***

Create a network of layered care for students. Include teaching students about self-care, providing students with community care from faculty and staff, and offering professional care when appropriate.

Remove mental health stigma. All stakeholders in higher education should be able to communicate about mental health without fear of being stigmatized. Foster an environment of open communication and compassion and normalize mental health conversations.

Supporting Mental Health in Practice

The Affect Effect: Building Community and Reflective Learning with Affective Design in Immersive Learning Simulations

Conestoga College's VARLab builds virtual simulations designed to promote meaningful emotional reflection. Firefighting students rehearse rescuing victims in realistic simulated fires. Simulations are scaffolded with intensive affective pedagogy, helping students explore how emotions impact decision-making in dangerous situations. Other projects include a virtual community learning campus where students can work, learn, and play together, and another where students collaborate across disciplines to solve the wicked problem of climate change.

Building Capacity to Address Mental Health through Simulation

A library of virtual simulations and videos was created to meet the growing needs of learners in various professions who are preparing to provide mental and behavioral health services. One application of the library is provided by Yeshiva University, where social work students use simulations to enhance advanced practice skills, and another is at East Carolina University, where occupational therapy students use simulation-based learning during a supervised mental health fieldwork experience.

Flourish Labs

In 2021, Flourish Labs launched Peers.net to help address the mental health crisis in higher education and empower college students with the skills and knowledge needed to support peers experiencing mental health challenges. WGU Labs worked with Flourish staff members and potential peer supporters to develop an engaging online program that helps trainees build competence and confidence to provide support to peers experiencing mental health crises.

Enhancing Student Wellness: University of Central Florida's Global Navigation Initiative

The University of Central Florida's Center for Distributed Learning, in collaboration with the university's Division of Student Success and Well-Being, pioneered accessibility of student mental health resources at scale by integrating dedicated well-being resources within the Global Navigation of the Canvas LMS. This mental health initiative guarantees that more than 70,000 students have effortless access to critical well-being resources and services, reducing barriers and fostering a culture of holistic student success.

A Peer-Based Mental Health Community: Supporting Students at Scale

Officials at American Public University System (APUS) know that stress, anxiety, and life issues impact student success. To support the scale of need, we partnered with TalkCampus to launch a peer-based online community so that students can share experiences and support each other in a confidential and safe way. This social community is a part of our comprehensive suite of mental health and wellness services offered to roughly 85,000 students around the globe.

Training Future Counselors to Support Mental Health

Counselors receive extensive training and complete internships as part of their education before beginning professional work. To assist future counselors in learning and practicing specific skills and techniques before, during, and beyond their internship, a team at NC State University created an interactive chatbot with video inserts. Students assume the counselor role, conduct a session with a first-year college student, and select clinical questions to obtain responses from the client.

FURTHER READING

American Psychological Association
"Student Mental Health Is in Crisis. Campuses Are Rethinking Their Approach"

American Council on Education
Six Considerations for Student Mental Health in Higher Education for the 2023–24 Academic Year

Healthy Minds Network
The Healthy Minds Study: 2022–2023 Data Report

Stanford Teaching Commons
"Promoting Mental Health and Well-Being in Learning Environments"

Chronicle of Higher Education
"Professors Struggle with Demands to Tend to Students' Mental Health"

American Psychiatric Association
"Fostering College Student Mental Health and Resilience"

Time
"With Demand for Mental-Health Care Soaring on Campus, Faculty and Students Are Stepping Up to Help"

The Journalist's Resource
"Improving College Student Mental Health: Research on Promising Campus Interventions"

SCENARIOS

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

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

Panelists were actively engaged in creating the scenarios through small-group discussions imagining first-, second-, and third-order consequences for several possible futures that built on some initial sketches. For Growth, panelists explored implications of a future where unfettered expansion in AI technologies has led to widespread and substantive changes to the global workforce across most industries. In the Constraint scenario, the starting point was a future where cybercrime runs rampant. The potential future for Collapse was a world where global division and conflict is increasingly putting pressure on higher education institutions to "choose sides." And finally, in the Transformation scenario, institutions are pressed to respond to enrollment challenges exacerbated by declining public perceptions of higher education and the mounting debt crisis.

The scenarios we offer here represent only potential futures, of course. With so much changing around us seemingly on a daily basis, it is impossible to know with any degree of certainty who we'll be and what higher education will be in 2034. The best we can do in the present day is use exercises like these to get better at anticipating and planning and to practice creative thinking about our future, grounded in the best information we have available to us, so that we can be more prepared to face whatever future does eventually arrive.

Growth

Collapse

Constraint

Transformation

GROWTH: WORKFORCE-DRIVEN HIGHER EDUCATION

Priya nestles into the corner of her couch, her morning coffee in one hand, a VR remote in the other. Through her VR lenses she navigates across a virtual college campus toward a towering glass "Data Strategies" building, where she's registered to earn a three-month credential in machine-learning algorithms.

Just a year ago her employer, a national food store chain, offloaded most of her responsibilities to a new AI-powered platform and offered Priya the opportunity to return to school to acquire new skills needed to help manage that platform. With two teenagers and a mortgage—and a growing desire for something new—she jumped at the opportunity.

Her employer subsidizes most of her second-career learning, covering the cost of tuition and learning materials and offering a few hours of paid time each week needed for learning and coursework. She has the option of earning additional credentials of more personal interest—she earned a creative writing credential a few months ago—though those credentials have to be earned on her own time and expense.

The virtual campus is alive with activity, teeming with student avatars coming and going, groups huddled here and there in private conversations. Priya stops and toggles over the "Participants" icon—it shows 112,350 students currently logged in to campus. "Map view," she says. A display of the United States zooms in and shows a scattering of dots in the northeast and down the east coast into Florida. Formerly a four-year brick-and-mortar institution planted in the hills of Arkansas and primarily pulling in traditional students from its surrounding communities, the school is now all but completely virtual and widely dispersed across the eastern United States. It boasts nearly tripled enrollments over the past five years, especially among adult learners.

Priya takes a sip of her coffee. "How am I doing?" she asks. A dashboard pops into view, displaying a series of graphs and data points. A warm automated voice responds, "You are still on track to complete your credentials on time, but your employer has recommended you for an additional advanced module in team leadership skills."

She smiles. "Okay, let's do it."

In this future, unfettered growth of AI technologies has led to widespread and substantive changes to the global workforce across most industries. Re-skilling is needed by a more diverse and nontraditional community of students. Higher education institutions have significantly revised their education models to focus on quickly evolving workforce skills, leveraging anytime, anywhere learning to improve instructional agility and responsiveness to industry demands.

Enrollments among multi-career, adult learners far outpace the numbers of traditional students, which have continued their decades-long decline. The availability of traditional degree programs and credentials has declined as well, having been broken down into smaller components, combined, or rebuilt around the specific workforce-related skills that institutions may be able to provide.

Shorter-term microcredentials, flexible degree options, and skills-based certifications have become the new norm of higher education, leading to education experiences that are more inclusive and more attainable for a larger and more diverse population of learners. Industry has become a more engaged and vital partner in the shaping and offering of higher education, providing input into new learning requirements and curricula, filling instructor gaps where more industry-experienced faculty are needed, and helping subsidize and funnel current and future employees through the skills programs they need.

The public's perception of the benefits and usefulness of higher education has started to climb, even for some liberal arts programs that have successfully promoted the durability and importance of the less "technical" skills they provide. More niche humanities-based programs, however, remain under close scrutiny and suspicion, based on a perceived lack of transferability to the workforce. These programs are largely viewed as luxury "add on" programs relegated to smaller markets serving narrower special interests.

COLLAPSE: HIGHER EDUCATION'S POLITICAL TIDES

Devin loads the last bit of his luggage into the trunk of his car, pressing it down so that he can close the latch. His car is filled to the brim—he's leaving home for the first time in his life and driving several states away to attend college. He doesn't want to leave the family and friends and places he knows and loves, but the political tides of his home state are casting him away.

Nearly a decade ago, state leadership put forward new standards for postsecondary curriculum and assessment, infusing those standards with their own political and moral values and mandating that institutions adhere to those standards or lose all state funding and support. In the months that followed, some institutions saw waves of students, faculty, and staff exit in protest and simply couldn't maintain enrollments and operations.

"I'm halfway through my semester and half of my professors are gone," Devin's cousin once told him over a family dinner a few years back.

Other institutions shored up their values and pushed back against the state's new standards but couldn't stay afloat once state funding dried up and alternative, private sources of funding proved insufficient. Most of the institutions in the state that remained open did so by embracing or at least accommodating the new educational standards, standards that Devin in good conscience simply couldn't accept for his own personal learning journey.

"I wish you'd reconsider," Devin's mother says, making one final plea as she watches her son finish loading his car.

"I'll visit soon, and often," Devin replies. He'd thought about forgoing college altogether so that he wouldn't need to uproot and move away. His friends who decided not to enroll in college seemed to be doing well enough, and his mother had offered him a decent entry-level job at her medical practice. Most people didn't really seem to need a college degree anymore, at least if all the reports and news stories were to be believed.

Still, Devin knows the choice he's making is the best one for him. He waves to his parents through the car window and puts the car in drive.

In this future, global political division and conflict is putting pressure on higher education institutions. More and more institutions find themselves faced with an impossible choice: align with local, state, and federal political and moral ideologies, thereby alienating a large portion of learners and instructors and staff, or lose vital state and federal funding and face inevitable shutdown.

Degree programs, curricula, and even teaching and learning practices and materials have become vehicles for carrying and advancing particular political and moral agendas. Niche education service and technology providers are emerging to accommodate these agendas where existing providers can't or won't support politically and morally aligned institutions. The divisions and tensions within the education service and technology markets now mirror the larger divisions and tensions rending higher education and the world.

Higher education has experienced widespread turnover in both institutional leadership and faculty. State officials are more closely involved not only in vetting and selecting institutional leaders who will support the state's political and moral values but also in ousting institutional leaders who won't support those values. Faculty, seeing their intellectual and academic freedoms erode, resign from their positions en masse, either seeking friendlier institutions elsewhere or pursuing new careers altogether.

Most institutions' enrollments have plummeted as the public has grown increasingly disillusioned with higher education and as local- and state-level political and moral mandates have driven many potential students away. Alternative professional pathways and credentialing options are more attractive to many students than a traditional postsecondary route that is fraught with division and offers increasingly limited local or residential choices. More and more institutions, even institutions once viewed as more enduring "flagship" schools, are closing their doors, unable to square ideological alignment with financial viability.

CONSTRAINT: DATA-RESTRICTED HIGHER EDUCATION

Alex walks briskly along the red-brick sidewalk that winds up to the STEM building, their head tilted down and forward with determination. They're running late for class, thanks in no small part to a traffic jam that their old, folded city map was no help in navigating around.

Just to the left of the STEM building's front entryway and resting at the edge of a thicket of blackberry bramble, a "digital lock box" kiosk stands with half of its small metal doors shut and padlocked. Alex finds an open locker and places their phone and laptop inside. They forgot their padlock today, but the padlocks are more of a psychological salve—the biometric encryption on Alex's devices wouldn't allow anyone else to use the devices anyway.

On the side of the kiosk, amid flyers for tutoring services and social clubs, a sign cautions passersby, "No digital devices beyond this point!" Next to the sign a poster asks, "Is data pollution dragging you down? DataBusters™ can help you eliminate unnecessary personal data!" An image on the poster shows a student struggling under the weight of data graphs and algorithms piled up on their back.

Inside the building, Alex half runs, half walks down a short corridor to their classroom. Sunlight cuts into the hallway in beams through windows centuries older than anyone in the building. "I'm so sorry to be so late," Alex announces to a room full of students. The students settle into their seats and open their paper pads, pencils in hand ready to scratch down notes.

Alex tests a marker or two on the white board before finding one with enough ink. "I have a few handouts for you today that we need to go over, including your study guide for next week's test," Alex says. "But first, I need to make a correction to one of the equations I showed you last time."

The squeaking of marker and scratching of pencils fills the room. A song can faintly be heard as outside one of the old windows across the hall a starling alights on the branch of a blackberry bramble.

In this future, widespread surges in cybercrime are all over the news. Media outlets compare online environments to crime-riddled metropolitan areas, cautioning the public to shore up their data and device protection or to simply stay offline whenever possible. Security and privacy advocates find allies in climate and ethics leaders who decry the environmental and human costs of excessive data collection and use, gaining sufficient influence to lead sweeping social and political changes in national and global data practices.

As stewards of large data repositories, higher education institutions are implementing strict data governance, network security, and data and device removal policies. Most institutions operate through an "as little as possible" stance on the data they collect and store from their students, faculty, and staff. Data and analytics leaders, for their part, have failed to make a compelling case for their continued utility. Institutions reduce or completely shutter their data analytics functions, believing that the benefits of collecting and using data no longer outweigh the increasing risks to the institution's security and survival.

The use of personal devices on campus networks is strictly prohibited or significantly reduced and heavily monitored. Coursework, research, and collaboration are exclusively done on closed networks and devices or through more "back to basics" analog methods. Online learning, and online platforms for transacting with and supporting students, are eliminated. Classrooms look like time capsules preserving a bygone era—notes are taken by pencil and paper, instructors write on boards, textbooks weigh down students' bags.

A small number of well-resourced institutions can afford to buttress their technology infrastructure and security against external threats, relying on increased security and privacy staff and systems for maintaining cutting- edge technologies and online and digital practices. These institutions enjoy a unique competitive advantage among technology-minded segments of the public, as well as among students who rely on assistive technologies and flexible modalities for engaging in their courses. A yawning digital divide opens between these institutions and "back to basics" institutions, as does an ideological divide on the purpose of and best approaches to education.

TRANSFORMATION: INDIVIDUALIZED HIGHER EDUCATION

"Hello, Madison."

The greeting fades in and then out as Madison logs into her learning portal. Her seat on the train is cramped, but she adjusts the size of her holoscreen to fit comfortably on the seatback tray in front of her. The Peruvian countryside rushes by outside her window.

Madison pulls her "to do" list onto the screen and lets out a sigh—200 pages of Faulkner to read before the end of the week. She points a finger at the "I need help" icon to the side of the task, and the system thinks for a moment. A message pops up, "You have two hours left in your train ride. Based on your average reading speed and comprehension scores, and with the recommended assisted review, you can get 65 pages of this book read by the time you reach your destination."

Madison furrows her brow. She points at the "Give me more help" button at the bottom of the message. The system thinks once more, for slightly longer this time. "Your sleep patterns have been erratic the last few days, likely due to your travel," the message reads. "And I see that your schedule tomorrow is light. Adjusting for your current state of elevated exhaustion, and shifting a portion of this task to your schedule tomorrow, I recommend reading 35 pages during your train ride today."

"That's better," Madison says as she closes the message. She pulls the book up on her screen and begins to read. As she reaches the end of the first page, a lightbulb icon appears on the screen with another message. "The page you've just read contains important details for your upcoming comprehension assessment. Would you like to see an in-depth review of these details now or save this review for later?" Madison opts to save review for later, which prompts another, more urgent message.

"You have failed to complete past reviews, which has likely impacted your assessment scores so far this term," the message cautions. "Your instructor has recommended that you complete your reviews as you read rather than saving them for later. Would you like to see an in-depth review now?"

Madison huffs and waves her hand to power down the holoscreen. She shifts and settles into her seat and closes her eyes to rest as the countryside rushes by.

In this future, declining public perceptions of higher education and the mounting student debt crisis have exacerbated enrollment challenges for institutions. Higher education leaders call for institutions to improve their value to learners by refocusing on hyper-individualized instruction and a commitment to the greater good.

Degree programs, courses, and even individual course sessions and tasks become tailored and unique to each individual learner, adjusting to their learning preferences and styles and their personal goals for their experience. Higher education has become a "choose your own adventure" undertaking, and collaborative, social approaches to learning are in short supply.

New AI technologies and analytics capabilities help guide individual students along their educational journey. These tools provide instruction, responsive coursework prompts and assistance, tailored learning content and materials, and individualized pathways toward each student's program and learning outcomes. Faculty increasingly focus on administrative tasks, managing the outputs of their AI and data systems, and individualized coaching and remediation, devoting considerably less time to direct instruction and the day-to-day management of coursework and student engagement.

Students are viewed not only as "learners" but also increasingly as "digital consumers" with expectations fitted to the global digital economy. Marketing, communications, and enrollment are highly personalized and tied to each student's larger digital footprint and consumer behaviors. Partnerships between institutions and industry support the sharing of consumer data and of profits from increased enrollments.

With highly tailored and personalized educational experiences, and more satisfied learners and families, institutions are better positioned to offer the public a compelling argument for the benefits of higher education and a compelling argument for the "public good" they serve. Public perceptions of the value of higher education slow their decline and even increase among some segments, and enrollments begin to turn around for those institutions with the resources to support the data and digital infrastructure needed for hyper-personalization.

METHODOLOGY

The *Horizon Report* methodology is grounded in the perspectives and knowledge of an expert panel of practitioners and thought leaders from around the world who represent the higher education, teaching and learning, and technology fields. This year's group included returning and first-time Horizon panelists, all sought out for their unique viewpoints, as well as for their contributions and leadership within their respective domains. The panel represents a balance of global contexts. 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.

This expert panel research utilized a modified Delphi process and elements adapted from the Institute for the Future (IFTF) foresight methodology. In the Delphi process, an organized group of experts discusses and converges on a set of forecasts for the future, on the basis of their own expertise and knowledge. For this report, 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—capturing a reliable consensus from a group of experts that represents their collective expertise and knowledge.

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

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

For information about research standards, including for sponsored research, see the EDUCAUSE Research Policy.

Panel Questions

STEEP Trends

Round 1 (for each STEEP trend category):
In the appropriate STEEP category below, nominate trends that will impact the future of teaching and learning in higher education. Your nomination should include (1) a sentence to describe the trend as the title of the card; (2) how this trend will impact teaching and learning in higher education; (3) links to supporting news or research; and (4) your name. Your name MUST be included to receive credit for the activity. To enrich the content, we encourage you to comment on the posts of your colleagues to add your thoughts.

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

Round 3 (for each of the top 15 trends identified by the panel):
What additional evidence can you provide for this trend? Examples of good evidence include recent (i.e., within the last year) research reports, credible news stories, personal experiences, etc.

1. What additional evidence can you provide for this trend? Examples of good evidence include recent (i.e., within the last year) research reports, credible news stories, personal experiences, etc.
2. What potential impacts might this trend have on the future of 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.

What do we mean by "key technologies and practices"? For the purposes of the *Horizon Report*, these are practices that are either new or for which there is substantial, perhaps transformative, new development. An important dimension of these technologies and practices is that they have the potential to have significant impacts and effects on supporting teaching and learning. In particular, think about technologies and practices that have the potential to mitigate or accelerate the trends the panel has identified.

Your submissions should include a description of the key technology or practice, its impact on teaching and learning in higher education, and links to supporting news or research. Your name MUST be included to receive credit for the activity.

Each nomination should include 1) a description of the key technology or practice as the title; 2) its impact on teaching and learning in higher education; and 3) links to supporting news or research. To enrich the content, we encourage you to comment on the posts of your colleagues to add your thoughts.

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

Round 3: Panelists were asked to respond to the following questions about each of the top six technologies and practices:

- Which of the following trends are supported or mitigated by <tech/practice>? Select all that apply.
- In what ways could higher education stakeholders (i.e., staff, faculty, students) use <tech/practice> to support the holistic student experience?
- What risks, if any, might higher education stakeholders (i.e., staff, faculty, students) face when implementing <tech/practice>?
- How, if at all, might higher education stakeholders (i.e., staff, faculty, students) leverage <tech/practice> to support diversity, equity, and inclusion?
- What further reading (e.g., news articles, institutional examples) about <tech/practice> can you suggest for readers of the *Horizon Report*?

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APPENDIX: ADDITIONAL EXAMPLES OF TEACHING AND LEARNING TECHNOLOGIES AND PRACTICES

Supporting AI Fluency

AI EduCraft Series: Revolutionizing Teaching and Research

Tailored for faculty, the EduCraft micro-workshop series on artificial intelligence in higher education prioritizes a human-centered pedagogy. Focusing on practical applications, participants develop AI literacy to seamlessly integrate technology into teaching and research. The series explores AI's impact on education, emphasizing a balanced approach that enhances student-centric learning. By dissecting the role of AI in reshaping assessments and addressing ethical concerns, it ensures faculty understand and apply these technologies with empathy, fostering an inclusive and effective educational experience.

Artificial Intelligence for Business Innovation and Sustainability

The purpose of Artificial Intelligence for Business Innovation and Sustainability (AIBIS) is to promote student engagement, applied learning, and career success by introducing AI curriculum content in active-learning business classrooms in which students explore how to create and foster sustainable business practices using AI. We collected and curated open educational resources on AI in a publicly available webpage designed by the business library team.

Demystifying AI: Digital Detox 2024

Demystifying AI is a series of six interactive modules developed by Middlebury College focused on engaging a diverse audience around the fundamentals of AI through exploration and play but with a focus on moral and ethical use. Participants explore these technologies while gaining the skills needed to navigate this nascent environment as critical users—protecting themselves, behaving ethically, and taking advantage of the affordances of an increasingly AI-entwined future.

MIT Sloan Teaching with Generative AI Resource Hub

MIT Sloan's AI Hub aims to guide faculty in leveraging AI to enhance teaching and learning. It offers practical strategies, curated tools, and real examples from classrooms to support faculty in thoughtfully integrating generative AI while prioritizing student privacy and ethical considerations.

Partners for Algorithmic Literacy: Student–Faculty Learning Community

The Partners for Algorithmic Literacy (PAL) learning community at Purdue University Libraries transforms academia's response to AI from reactive to proactive and participatory, bridging ingrained barriers between teachers and learners. PAL creates a supportive, collaborative space where students and instructors build inclusive educational experiences that create engagement through AI technologies. As partners, participants share perspectives and engage in groundbreaking work to co-design curricular plans that foster dialogue and shared decision-making about AI in classrooms.

Design Forward: The AI Challenge

The AI Challenge is a self-paced, online module to build faculty capacity around generative AI. Organized around teaching *with*, teaching *against*, and teaching *about* generative AI, the module provides a grounding in how generative AI works and its practical affordances; it also challenges faculty to think critically about generative AI as they facilitate student engagement with the technologies. The module, designed by the Plymouth State University Open CoLab, is free and open to everyone.

Navigating the Future: Open Education with Generative AI

"Navigating the Future: Open Education with Generative AI" is an online course that explores the connections between generative AI, open educational resources (OER), and open pedagogy. This course was developed by College of the Canyons as the technical assistance provider for the California Community College Chancellor's Office Zero Textbook Cost Grant Program. The course is offered free through the @One California Virtual Campus and is openly licensed.

AI and Information Literacy Online Module

University of Maryland's Libraries and Teaching and Learning Transformation Center collaborated to create an online module on AI and information literacy that can be inserted into any course. It trains students to evaluate how to use AI-based tools responsibly in academic work by providing a strong foundation on the mechanisms and ethics of these tools, as well as strategies for verifying and citing content from them.

Supporting Equitable and Inclusive Learning

Virtual Research Group Modules: Scalable Simulations of STEM Research

Virtual research group modules developed by the Rose-Hulman Institute of Technology and Rutgers University provide a model for simulating the investigative, discovery, and peer-learning aspects of the research process using curated data from existing scientific literature. These modules, which have been piloted with high school and undergraduate students, enable broad access to research experiences across the STEM pipeline due to their scalability, lack of requirement of physical laboratory resources, and ability to be packaged as educational kits.

Inclusive Curriculum and Learning Environment

To help educators in higher education create curricula and learning environments that are inclusive, Utrecht University developed a reflection tool and the UU Inclusive Teaching Toolbox. The first is a resource that educators use to reflect on different aspects of their course and teaching (i.e., teaching material or assessment). After reflection, educators can find best practices in the toolbox to make lasting changes to their teaching.

UTSA's Student Experience Project Community of Practice

Through the Student Experience Project Community of Practice (SEP COP), UTSA is investing in faculty growth and development aimed at cultivating a sense of belonging, promoting a growth mindset, and fostering learning mindsets to improve classroom performance and persistence to degree completion. Faculty participants are collaborating to create a future of higher education where all students, especially those who face barriers, feel supported to overcome academic challenges and graduate successfully.

Rob-O-Chem: Revolutionizing Remote Chemistry Labs

Authentic lab experiences are inaccessible for many students due to lab costs, proximity, motor disabilities, and health/safety concerns. An interdisciplinary team at NC State University piloted new technology integrating robotics, live video streams, and an interactive website, allowing students to perform lab experiments. Providing students virtual access to the lab's physical environment helps increase knowledge, build confidence, and gain critical skills needed to develop lab interpretation and troubleshooting skills.

Maizey: U-M's Gateway to AI-Enhanced Education for All

U-M Maizey represents a groundbreaking initiative by the University of Michigan with AI in education, focusing on inclusivity, security, and accessibility. As a no-code platform, Maizey enables seamless integration with datasets from Canvas, Google, Dropbox, and web pages to create bots such as AI-powered educational assistants. This innovative approach allows educators and students to harness the power of AI without specialized knowledge, which enables making this technology inclusive and accessible to all faculty, staff, and students at the University of Michigan. This tool boosts learning results by offering personalized study aids available 24/7, prioritizes data privacy, and promotes fair access to AI technology.

Minoritized Student Mental Models of the Research Process

Academic libraries collect materials and offer resources to support scholarly research, often with distinctive services for emerging scholars. Library instructors who teach foundational information literacy seek to enhance their service by integrating students' experiences and insights into learning materials. This University of California, Santa Barbara, project showcases the applications of UX and participatory design methodologies to enable minoritized students to shape the content and design of learning materials for future emerging scholars.

The University of Texas System's Exemplary Student Pathways Project

The Exemplary Student Pathways Project is an initiative of the University of Texas System that aims to improve student success at scale by redesigning curricular pathways at the UT System's nine academic institutions. The project positions the curriculum as the locus of change to achieve equitable student success; cultivates data agency through an iterative change model; and supports institutional projects and action plans that align with longer-term institutional goals.

Care Services: Fostering Mental Wellness at FSW

Care Services at Florida SouthWestern State College delivers comprehensive mental health support, partnering with The Center for Progress and Excellence to offer 24/7 mental health support lines, in-person counseling, and mental wellness education at no cost. It embodies FSW's mission of promoting a culture of mental wellness, integrating community resources, and ensuring student access to essential support services across all FSW locations.