



**INNOVATION
IN AN
AGE OF
DISRUPTION**

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The Entrepreneurial Mindset and the Mechanics of Innovation

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Section 1: Executive Summary

How do you think outside the box? In other words, how do you approach thinking differently about the world around you and your institutional and organizational challenges? More importantly, how do you go beyond just thinking differently to actually *seeing* things differently?

This question is what drove the entire 2019 APPA Thought Leaders symposium. It's something that people often say when someone is faced with a challenge: "Just think outside the box! Just think differently!" But how, exactly, do we go about doing that?

Higher education is obsessed with innovation these days, but the calls for college and university leaders to "just innovate" are about as fruitless as those to think outside the box. We need some solid, matter-of-fact strategies, processes, and techniques to help us innovate and create.

This year, participants at the Thought Leaders symposium explored the mechanics of innovation. They drew on the experience of experts in innovation and entrepreneurship and discussed ways to protect experimentation and creativity from institutional forces dedicated to the status quo. They practiced developing innovative strategies for addressing the challenges facing higher education. They learned that creativity must be fostered and encouraged within an institution within an institution, by modeling the entrepreneurial mindset to instill a curiosity to innovate.

Key takeaways about innovation and entrepreneurship

Participants returned to their campuses with some key insights:

First, despite repeated calls from higher education leaders, **few institutions are truly embracing in-**

Data Point:

Promoting innovation in higher education

An innovator's way of being (what is it that innovators do?)

"They grab and apply what they can. Innovators leverage existing, new, proven, or unproven methods or tools to improve practice, solve persistent problems, or create a completely new offering, service, solution, product, or idea."

"Do not shy away from choices. Innovators make important choices and trade-offs throughout their process."

"They are inspired by their world and use it. Innovators identify tools, ideas, strands, or practices from other fields and apply it to a new context."

"Try, try, and try again. They don't view innovation as 'right or wrong,' 'a failure or success;' instead all approaches are considered, tested, prototyped, and learned from."

— Bryan Setser and Holly Morris, *Building a Culture of Innovation in Higher Education: Design & Practice for Leaders: Emerging Lessons and a New Tool*, 2Revolutions and EDUCAUSE, April 16, 2015.

novation in the face of adaptive challenges. An adaptive challenge is simply defined as one that threatens the status quo of an institution; these challenges can develop slowly, are sometimes hard to recognize, and are even harder to acknowledge. Most colleges and universities make no systematic effort to prepare for major adaptive challenges that could disrupt or challenge the entire institution. It's hard to see how facilities organizations will survive intact if they don't develop strategic plans to face the challenges that threaten their futures.

Second, **innovation and entrepreneurship are a mindset that anyone can embrace.** You don't have to be an artist, theater director, or Silicon Valley software developer to think in creative, innovative, entrepreneurial ways. Anyone with a passion for their job, a willingness to work hard, and a strong institutional commitment can be an innovator or entrepreneur. Innovation comes down to openness and willingness to embrace change. It can be fostered at any level of the organization.

Third, **barriers to innovation and entrepreneurship are pervasive and hard to shake.** Many people and processes within the institution are committed to the status quo. The higher education industry has naturally evolved to preserve tradition, which naturally fights innovation. It will take hard work, teamwork among committed innovators, and a willingness to be uncomfortable yet embrace risk to overcome these barriers.

Data Point:

Promoting innovation in higher education

How innovators and entrepreneurs look at the world

"Great creators, innovators, and entrepreneurs look at the world in ways that are different from how many of us look at things. This is why they see opportunities that other people miss."

— Adam Brandenburger, "To Change the Way You Think, Change the Way You See," *Harvard Business Review*, April 16, 2019.

Finally, **mission matters.** The higher education industry is unusual among large institutions in its commitment to a mission of education, research, and community engagement. The power of this mission is impossible to overstate. When employees take ownership of this mission and channel it into

new endeavors, the institution thrives. When the mission is ignored, overlooked, or cynically dismissed, the institution stagnates.

Participants at the Thought Leaders symposium came away from their time together with a new commitment to the mission of each of their institutions and a renewed sense of passion and ownership. We hope that our readers find the same inspiration in these pages. To help you channel your work and meet the challenges facing your institution, we encourage you to carefully read Section 6, "Questions for Campus Discussion." We urge you to use these questions as a starting point for communication within your college or university, and hope that they point the way forward to inspired innovation and entrepreneurship on your campus.

Data Point:

Promoting innovation in higher education

The hard truth about innovative cultures

"Innovative cultures are misunderstood. The easy-to-like behaviors that get so much attention are only one side of the coin. They must be counterbalanced by some tougher and frankly less fun behaviors. A tolerance for failure requires an intolerance for incompetence. A willingness to experiment requires rigorous discipline. Psychological safety requires comfort with brutal candor. Collaboration must be balanced with individual accountability. And flatness requires strong leadership. Innovative cultures are paradoxical. Unless the tensions created by this paradox are carefully managed, attempts to create an innovative culture will fail."

— Gary P. Pisano, "The Hard Truth About Innovative Cultures," *Harvard Business Review*, January-February 2019.

Section 2:

Common Approaches to Higher Education Challenges

Understanding the difference between technical problems and adaptive challenges

Most colleges and universities don't invest in developing strategies for solving significant adaptive challenges, which is why change is so slow in higher education. Many create emergency operations plans and look for ways to mitigate risk. But rarely do they think about **how they will solve major adaptive challenges**.

It's important here to differentiate between **technical problems and adaptive challenges**. A technical problem is a situation that requires immediate attention and resolution, but it does not threaten the long-term future of the institution. A snowstorm or hurricane is a technical problem; so is a ransomware attack on a major computer system or a security threat before a big football game. These problems

are serious, but they can be solved by experts given adequate resources. As long as the problem is handled competently, the institution is not at risk.

An adaptive challenge, on the other hand, threatens the status quo of an institution. Solving the challenge demands more than expertise—it might require change to fundamental aspects of the institution including roles, responsibilities, relationships, and mission. **Solutions to these problems are not and will not be easy fixes.** They will take time and experimentation, and individuals across the organization will need to contribute for them to succeed. Adaptive challenges can move slowly, so they're sometimes hard to recognize—and even harder to acknowledge. You can't ignore a big technical problem, but many people can pretend an adaptive challenge either doesn't exist or won't affect their institution.

Data Point:

Technical problems vs. adaptive challenges

Know what you're facing so you know how to manage it

Technical Problems

Easy to identify.

Often lend themselves to quick and easy (cut-and-dried) solutions.

Often can be solved by an authority or expert.

Require changes in just one or a few places; often contained within organizational boundaries.

People are generally receptive to technical solutions.

Solutions can often be implemented quickly—even by edict.

Adaptive Challenges

Difficult to identify and easy to deny.

Require changes in values, beliefs, roles, relationships, and approaches to work.

People with the problem do the work of solving it.

Require change in numerous places; usually cross organizational boundaries.

People often resist even acknowledging adaptive challenges.

Solutions require experiments and new discoveries; they can take a long time to implement and cannot be implemented by edict.

— "Technical Problems vs. Adaptive Challenges," *Unpacking Adult Mindsets, NCS Postsecondary Success Toolkit*. Adapted from Ronald A. Heifetz and Donald L. Laurie, "The Work of Leadership," Harvard Business Review, January-February 1997.

Generally, developing strategies to meet anticipated technical problems is fairly straightforward. Again, that doesn't mean the problems are easy to solve, but they are usually easy to grasp and can be addressed without upending the entire structure and purpose of the institution. In contrast, **few institutions are prepared to develop proactive strategies to address adaptive challenges.** In fact, many institutions wouldn't even know where to start in developing a strategy to manage amorphous yet overwhelming adaptive challenges.

Current approaches for responding to adaptive challenges

Participants at the Thought Leaders symposium were asked how their institutions generally respond to adaptive challenges. The answers (shown below) revealed a great deal about the improvisatory nature of such responses:

Reinvent the wheel. Without a strategy in place, many colleges and universities must start from scratch every time they confront an adaptive challenge. This can end up wasting time developing processes and establishing committees that could have been better spent addressing the challenge itself.

Throw money at the problem. If an institution has the resources, it can attempt to solve adaptive challenges with cash. This might mean hiring expensive consultants, conducting lengthy studies, or writing long reports. While these strategies can identify important steps the institution should take, many things can go wrong with this approach. The reports might be ignored, the review panel or consultant might look at the wrong problem, or the consultants might not convince anyone to make serious changes. The hard work of addressing adaptive challenges cannot be outsourced.

Assign the problem to an individual or committee. It is important that problems be given owners, because an energetic, empowered individual or committee can make a real difference in addressing major challenges. However, committees can also be places where solutions go to die. If giving the prob-

lem away means that the rest of the organization's leaders feel free to stop worrying about it, then a solution is probably far away.

Rely on the institution's leaders. Every institution would hope that its leaders would be capable of addressing major challenges. Ultimately, however, the skills that leaders use to achieve their positions may not be the right skills to solve existential challenges to the institution. Strong, creative leaders will rise to the challenge; ineffective leaders lacking enough courage to implement change will falter.

Turn to established problem-solving protocols. The success or failure of this strategy is rooted in the fundamental differences between technical problems and adaptive challenges. Most institutions have established protocols to deal with technical problems, but these protocols are inadequate for confronting an adaptive challenge. The strategies, mindset, and management skills needed to successfully resolve a technical problem do not automatically translate to addressing an adaptive challenge.

Draw on the institution's mission, vision, and strategic plan. Referring back to the core statements and documents of an institution is an important step in addressing major challenges. It can help the college or university clarify who it is and what it values when making decisions that could transform the institution. However, this is only a step in addressing an adaptive challenge. It's important to keep the strategic plan and the institution's mission and vision in mind, but these statements alone will not walk the organization through a crisis.

Tap expertise across the campus. Colleges and universities are uniquely fortunate in the depth and breadth of knowledge at their fingertips. Experts from both faculty and staff should absolutely be engaged in addressing adaptive challenges. Again, however, this is only one part of an effective strategy. The experts need a framework in which to operate, a process to follow, and the authority to implement their recommendations.

While many of the approaches identified by the Thought Leaders participants were felt to be important for addressing major campus adaptive challenges, none of them made up a comprehensive strategy. Furthermore, something critical is missing in all these suggestions—an element of creativity

and innovation. Without that element, adaptive challenges can very well overwhelm the best-intentioned leader. It takes vision to foresee new trends and adapt current business models to take advantage of new opportunity.

Data Point:

Facing adaptive challenges

You can't fix adaptive challenges with technical solutions

“Adaptive problems... require individuals throughout the organization to alter their ways; as the people themselves are the problem, the solution lies with them. Responding to an adaptive challenge with a technical fix may have some short-term appeal. But to make real progress, sooner or later those who lead must ask themselves and the people in the organization to face a set of deeper issues—and to accept a solution that may require turning part or all of the organization upside down.

“It is at this point that danger lurks. And most people who lead in such a situation—swept up in the action, championing a cause they believe in—are caught unawares. Over and over again, we have seen courageous souls blissfully ignorant of an approaching threat until it was too late to respond.

“The hazard can take numerous forms. You may be attacked directly in an attempt to shift

the debate to your character and style and avoid discussion of your initiative. You may be marginalized, forced into the position of becoming so identified with one issue that your broad authority is undermined. You may be seduced by your supporters and, fearful of losing their approval and affection, fail to demand they make the sacrifices needed for the initiative to succeed. You may be diverted from your goal by people overwhelming you with the day-to-day details of carrying it out, keeping you busy and preoccupied.

“Each one of these thwarting tactics—whether done consciously or not—grows out of people’s aversion to the organizational disequilibrium created by your initiative. By attempting to undercut you, people strive to restore order, maintain what is familiar to them, and protect themselves from the pains of adaptive change. They want to be comfortable again, and you’re in the way.”

— Ronald Heifetz and Marty Linsky, “A Survival Guide for Leaders,” *Harvard Business Review*, June 2002.

Section 3:

Using Innovation and Entrepreneurship to Tackle Adaptive Challenges

What does it mean to think innovatively or just think differently? How do we approach seeing things differently?

If none of the current strategies employed by colleges and universities to address major adaptive challenges are adequate, what is needed? Where do institutions go to find the resources, strategies, and mindset that would help?

Often the answer—provided all too quickly and even glibly—is to “think outside the box.” Institutional leaders are urged to be creative when solving these challenges, as if it’s the easiest thing in the world. The fact is that actually “thinking outside the box” is extraordinarily difficult within large, bureaucratic, many-layered colleges and universities that operate under heavy regulation and oversight. Many institutional leaders got to their positions of authority through their diligence in staying firmly *within* the box. **Suddenly demanding the adoption of an entirely new way of thinking is a recipe for sheer frustration, fear, or feeling ill-prepared.**

We’ll examine what we mean here. Let’s break down different types of innovative and entrepreneurial thinking and discuss what sort of organizational structures encourage this way of working.

One theme emerges from all discussions of innovation and entrepreneurship: **the experience of looking at the familiar in an unfamiliar way.** According to New York University professor and expert on innovation Adam Brandenburger, creativity involves:

look[ing] at what is right in front of us, but look[ing] in a way that escapes most people. There is a word for this activity: de-familiarization. When we look at the world, we should not

just *examine*, but examine with a deliberately different perspective. Not just name what is around us, but come up with new names. Not just consider the whole, but break things up (or down) into pieces. These techniques can help us see our way to the new and the revolutionary.

Similarly, in her book *Mastermind: How to Think Like Sherlock Holmes*, author Maria Konnikova writes: “To observe, you must learn to separate situation from interpretation, yourself from what you are seeing.... This technique helps us to counter our natural tendency to focus only on the familiar way we see or experience things occurring around us.”

Encouraging innovation

The first strategy for out-of-the-box thinking was presented to symposium participants by Rob Brodnick, consultant and founder of Sierra Learning Solutions. Innovation, says Brodnick, is a way of thinking and acting toward the world. **It’s a mindset of openness and growth, a mindset that embraces constant learning and active engagement with others.** It’s not an easy way to be. Many forces in our world, Brodnick warns, will resist your embrace of an innovator’s mindset and try to pull you back into your old, static way of being.

The innovator’s mindset includes three related but separate concepts. The first is creativity. **Brodnick defines creativity as the ability to transcend traditional ideas, rules, and ways of working.** Creativity is something that happens in the mind. It’s a sort of thinking that looks at problems from new angles or applies new concepts in novel situations. Often the most creative ideas take two disparate concepts and combine them in unexpected ways.

The second concept is innovation. Innovation takes creative ideas and puts them into action. **If cre-**

Data Point:**Innovation in higher education facilities****Characteristics of innovative colleges and universities**

A study of nine campuses by the Councils of Independent Colleges' Project on the Future of Independent Higher Education identified six themes that emerged from all the colleges and universities they studied. They were:

1. **A bias for action.** The institutions were eager to take on challenges and experiment with innovation.
2. **A drive to connect locally, regionally, and beyond.** Each college and university was actively engaged with external stakeholders, campus constituencies, supporters, and current and potential markets.
3. **Realistic self-assessment and adaptation.** The institution was honest about itself and its strengths and weaknesses and paid

close attention to what was likely to prove successful.

4. **Structuring for innovation.** Leaders at each campus established organizational processes that fit the challenges being addressed.
5. **Assertive leadership with shared governance traditions.** Innovations were sponsored by passionate and hardworking advocates and tied to the college or university's historical roots and traditions.
6. **Alignment of mission and innovation.** Leaders "uniformly emphasized the importance of preserving or expanding their colleges' missions, rather than forsaking or compromising those missions."

— Adapted from James C. Hearn, Jarrett B. Warshaw, and Erin B. Ciarimboli, *Strategic Change and Innovation in Independent Colleges: Nine Mission-Driven Campuses*, The Council of Independent Colleges, April 2016.

activity happens in the mind, innovation happens in the real world. It can be a highly experimental and iterative process, in which creative concepts are tried out, refined, and reapplied. Innovation remains open-ended—multiple concepts might be explored.

The final concept is design thinking, which Brodnick defines as a human-centered approach to innovation that integrates the needs of people, the possibilities offered by technology, and the requirements for success. **Design thinking is all about drawing value from creativity and innovation.** It's possible to be creative to no purpose. That's not necessarily a bad thing if you're an artist, but for an organization trying to harness creativity and innovation to solve problems, design thinking is critical. Where creativity is entirely fluid, it generates endless possibilities. Design thinking and innovation put parameters on those possibilities, applies criteria for success, and seeks consensus on the optimal solution.

With these definitions in mind, a process begins to emerge. First comes creativity, a flexible,

wide-ranging mindset that draws on multiple viewpoints. Next comes innovation, when ideas are applied in the real world. Finally comes design thinking, when ideas are refined for practicalities and concepts assessed according to the value they bring to the organization.

The challenge with this process is that it is a poor fit for many institutions. Most organizations thrive on routine. Unless organizations are specifically designed to accommodate it, they are ill-prepared for experimentation and innovation and find rampant creativity disruptive. The solution is to protect innovation—to shelter it in an organizational structure where it can thrive.

Organizations can take several different approaches to insulating and encouraging innovation:

1. **Traditional research and development.** An R&D operation is a traditional approach in manufacturing, and for good reason—it can give innovators the time and resources to explore new concepts. Higher education has had success with this strategy for decades, allowing internal

research, new courses, and innovative programs to take shape within R&D. The limitation of traditional R&D is that it can result in a relatively closed system that can get stuck in certain modes of thinking.

2. **Open innovation.** This is the strategy adopted by many technology companies, especially start-ups. It's an approach where innovation is encouraged throughout the organization and across organizational boundaries to include partners. Individuals are encouraged to constantly collaborate and learn from other parts of the organization. This is a difficult approach to impose on an existing institution, since its ways of working are well-established and difficult to change.
3. **Sandboxing.** Sandboxing allows an institution to protect innovation and allow it a safe space to thrive. Business incubators or accelerators are good examples of sandboxing. They provide the time, space, and resources for creative thinking and iterative innovation.
4. **Resource pool or innovation fund.** This strategy also provides time and resources for innovation by allowing individuals or units with new ideas to apply for funding, usually in response to a particular problem or under strategic criteria. The challenge with this model is that the experimentation necessary to try out ideas must still take place within the institution itself, and an institution stuck in traditional thinking can shut down those experiments. However, rewards and special recognition can be powerful motivators that can break the cycle and showcase the application of innovation in their work.
5. **Communities of practice.** This strategy draws together individuals from across an institution to focus on a specific issue or challenge. One key value of this strategy is that these individuals then return to their home department or unit and can spread new ideas across the culture of the organization. Learning is a key element of communities of practice, which makes them well-suited for higher education; the communities are designed to create, share, and apply knowledge within and across the organization.

Data Point: **Strategies for promoting innovation**

Communities of practice

"What are communities of practice? In brief, they're groups of people informally bound together by shared expertise and passion for a joint enterprise—engineers engaged in deep-water drilling, for example, consultants who specialize in strategic marketing, or frontline managers in charge of check processing at a large commercial bank. Some communities of practice meet regularly—for lunch on Thursdays, say. Others are connected primarily by email networks.... Inevitably, however, people in communities of practice share their experiences and knowledge in free-flowing, creative ways that foster new approaches to problems.

"Because its primary 'output'—knowledge—is intangible, the community of practice might sound like another 'soft' management fad. But that's not the case. We have seen communities of practice improve organizational performance at companies as diverse as an international bank, a major car manufacturer, and a U.S. government agency. Communities of practice can drive strategy, generate new lines of business, solve problems, promote the spread of best practices, develop people's professional skills, and help companies recruit and retain talent."

— Etienne C. Wenger and William M. Snyder, "Communities of Practice: The Organizational Frontier," *Harvard Business Review*, January-February 2000.

6. **Innovation centers.** A step beyond accelerators or incubators, innovation centers are organizational units designed to bring together creative thinkers across disciplines. The cross-disciplinary approach is critical to innovation centers, which encourage creativity by intentionally bringing together experts from disparate fields.
7. **Business model innovation.** This strategy involves generating new business models within and for the institution. Often the first step is analysis of the existing business models at work in an organization; this requires the institution or organizational unit to look carefully at all of

its activities that create value. This helps the organization evaluate its business model and find ways to enhance its efficiency; it can also help the organization identify opportunities for new business models within the framework of the existing institution. New business models have an advantage over many other forms of innovation because they are focused on adding value—and possibly even income—from day one. This takes the wind out of the sails of critics and gives innovators some breathing room to experiment.

Promoting an entrepreneurial mindset

Another way of thinking outside the box, and one that is a good companion to innovative thinking, is an entrepreneurial mindset. The foundations of entrepreneurship were presented to symposium participants by Ged Moody, a consultant and ardent entrepreneur. Moody notes that most people think of an entrepreneur as someone who starts a business. But Moody emphasizes that anyone can be an entrepreneur, even if they work within an organization. What matters is how they feel about their work. If they have a passion for the job and take ownership of their organization, they are showing entrepreneurial thinking. **Individuals can become “intrapreneurs” who build the business within the business.**

Passion is critical. No one will put in the hard work and long hours for something they find boring or distasteful. The same goes for talent. Entrepreneurs need to be good at what they do to take their work beyond the ordinary. The two need to go together. If someone is passionate about music but can't keep the beat and have a tin ear, they'll never make it at Carnegie Hall. The goal is to find that sweet spot where talent and passion overlap. It's at that point where individuals can focus on mastering their craft, whatever that craft might be. The musician will spend hours playing scales, the programmer will write endless lines of code, the actor will make the most of the bit parts in community theater. Any skill, even a hard-to-define skill like inspiring a team or organizing a project, can become a craft that is honed and refined through hard work and practice.

Ownership is equally important. **Entrepreneurs are committed to their work—they embrace**

Data Point:

Strategies for promoting innovation

Business model innovation

“Developing and experimenting with new business models that truly transform how an institution delivers value (while continuing to drive the performance of the current business model) is exceptionally difficult. Yet nowhere is the imperative for business model innovation more prevalent or more relevant than in higher education, which is under intense scrutiny and facing rising costs and potential disruption from all angles.

“To compete in a world where the shelf life of business models is shortening, higher education leaders need the tools, skills, and experience to envision, test, and implement new business models. They must believe in the power of experimenting, in the real world, with a network of collaborators who have the audacity to change everything. As the legendary innovation mastermind Clayton Christensen says: ‘You don’t change a company by giving them ideas. You change them by training them to think a different way.’”

— Christine Flanagan, “Business Model Innovation: A Blueprint for Higher Education,” *EDUCAUSE Review*, November 1, 2012.

leadership roles and take on responsibility. That doesn't necessarily mean they are in senior positions. A groundskeeper can have a passion for the landscape and take ownership of the appearance of the lawns and flowerbeds under their care. This type of ownership can spread across the organization and inspire others to look at their work in new ways. Entrepreneurs tend to lift others up as they themselves rise. Entrepreneurs also think big. They see beyond their corner of the organization and take in the big picture. They're always considering the next step and asking what's next.

Finally, the crucial factor that separates entrepreneurs from everyone else is their willingness to take risks. This is most obvious in business owners, who assume the financial and professional risks of establishing a new enterprise. **However, even within an organization, entrepreneurs take on risks.** At a minimum, they risk failure—and being exposed

Data Point:

Entrepreneurship *Within* the Organization

The four essential traits of “intrapreneurs”

1. **Money is not their measurement.** “Intrapreneurs certainly respect the value and importance of money.... A non-intrapreneur is perpetually looking for non-economic ways to justify their own advancement and payment. An intrapreneur does their work in a way that shows the organization they are someone it can’t afford to lose. The money and advancement finds them.”
2. **They are “greenhousers.”** “When you speak about an intriguing idea to an intrapreneur, the idea never leaves them. It germinates within their mind, and they carry with them the desire to figure out how to make it work. When you see them next, they are likely to have grown the seed of an idea into a full-blown plan or they will have created
- an even better set of alternative plans in its stead.”
3. **They know how to pivot.** “Intrapreneurs aren’t afraid to change course, nor do they fear failure. It isn’t outward bravado that drives them but an inner confidence and courage that every step takes them closer to their ultimate goal.”
4. **They behave authentically and with integrity.** “Intrapreneurs exhibit the traits of confidence and humility—not the maverick behavior of corporate hotshots.... A budding businessperson could carry every other characteristic in spades, but without a foundation of integrity, they will fail.”

— David K. William, “The 4 Essential Traits of ‘Intrapreneurs,’” *Forbes*, October 30, 2013.

as a failure to peers can be terrifying. Risks only grow from there. Internal entrepreneurs might risk the finances or the reputation of their department or their institution as a whole. This level of risk is inevitable—it is part of being an entrepreneur. Individuals need to be aware of their own tolerance for risk and the tolerance of their peers, managers, and institutional leaders.

Moody recommends the following methods to anyone seeking to be an entrepreneur within their own organization:

Connect to the mission. An entrepreneurial mindset looks beyond the day-to-day tasks of their job to the mission of the institution. That groundskeeper who takes ownership of the lawns and flowerbeds sees his or her work as furthering the goals of the entire college or university. Ultimately every individual filling every role on campus should be able to look to the mission and see their role in advancing it. Commitment to the bigger mission is reflected in the entrepreneur’s ownership of his or her particular effort.

Be the best at what you do. Entrepreneurs become experts at their work. They hone their skills and

master their craft. They seek out knowledge from other experts and never miss an opportunity to learn.

Share success. All that passion and focus on the mission creates a certain level of intensity—but it shouldn’t blind entrepreneurs to the needs and goals of others. There’s a stereotype of the relentless entrepreneur, running over everyone who gets in their way. That’s not the way to succeed in the long run, especially when growing an entrepreneurial mindset *within* an organization. True entrepreneurs are generous with their time and energy, understand the passions and priorities of those around them, and share their success with those who help along the way.

The most critical point Moody makes is that entrepreneurship doesn’t have to wait for the creation of a new business—or a new project or program within your college or university. **As a mindset, it can be effective anytime and be adopted by anyone.** Passionate, mission-driven employees are the most valuable people in an organization. Facilities professionals should seek to identify those individuals within their teams and encourage them to embrace the entrepreneurial talent already there.

Section 4:

Applying an Innovative and Entrepreneurial Mindset to Higher Education's Adaptive Challenges

Lessons for higher education

How can campus leaders most effectively apply the concepts of innovation and entrepreneurship within higher education? A key factor, the group decided, is higher education's strong sense of mission. Colleges and universities are established with ambitious goals to increase the world's store of knowledge, promote learning, advance science, and serve both the local and global community. That mission is enormously powerful. **When individuals within the organization own that mission and see their work as advancing it, they are well on the way to**

adopting an entrepreneurial mindset. Participants at the Thought Leaders symposium discussed the importance of that mindset in their own work and how they try to promote it among their teams. "I strongly believe everyone who works on campus is an educator in their own way," stated one participant. "When it's four in the morning and there's a crisis on campus, I need to be able to call someone who really cares about the institution," said another.

Participants discussed ways in which they can increase connection to the mission, especially among staff. One is to make clear the value of the work of

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Data Point:

Innovation in higher education

Promoting innovation at Davidson College

Liberal arts college Davidson College has invested in a major effort to foster innovation to address major challenges facing the institution. The effort began with an assessment of the college's internal capacity for innovation as well as a close look at the institution's mission and values. Davidson then developed a one-page statement, known as the strategic framework, that captures the aspirations and goals for the college.

The next step was the creation of the "Idea Trek" program, which encourages any member of the campus community to submit ideas for improving the institution. Individuals submit ideas through a website, and a dedicated innovation team evaluates ideas against the strategic framework as well as the Academic Strategic Plan. Ideas that meet these criteria are passed along to campus departments for further study and implementation.

Davidson also created a new incubator with the goal of encouraging experimentation and innovation. The incubator "provides a transparent and collaborative system for vetting new ideas to make sure we are investing resources wisely, avoiding duplication, taking advantage of new opportunities, and inviting diverse perspectives and subject-matter expertise to guide our innovations." The incubator relies on an iterative process in which ideas are piloted, assessed, and can then be modified and tried again.

"The traditional structures and ways of working in higher education run the risk of falling too far behind the pace of change," said Kristen Eshleman, director of digital innovation at Davidson. "CIOs, provosts, directors of academic innovation, and others tapped to lead innovation can and should develop the frameworks that both speak to academic values and help us all adapt to a changing context."

—Sources: Kristen Eshleman, "Emergent EDU: Complexity and Innovation in Higher Ed," *EDUCAUSE Review*, May 7, 2018, and Davidson Idea Trek at davidson.ideascale.com.

each department or individual. For example, help the residence hall staff see the ways they can advise students living away from home for the first time; show the groundskeepers how their work attracts new students; or share the impact of an efficient financial system on the school's bottom line. Staff need to know that what they do is directly tied to the long-term health of the institution and the success of its students.

This type of ownership of the institution can be modeled by its leaders, and it can be emphasized in day-to-day work. However, some people will walk into the job with passion and a sense of ownership—and others won't. Participants agreed that managers should strive to hire those that show these qualities—to the point of prioritizing passion over skills. "I can teach the technical skills," said one of the symposium participants. "I'd rather have a new employee who is enthusiastic and committed. They can learn the rest."

Barriers within higher education

While higher education would certainly benefit from more innovative and entrepreneurial thinking, multiple barriers stand in the way of this mentality:

- **Regulation.** Higher education, especially public higher education, is a highly regulated field. Just to pick one example, public institutional procurement is often determined by state laws and policies that might be decades old. These policies don't account for rapid changes in technology and often add significant time and cost to purchasing. It's hard to innovate within the framework of these complicated, inflexible rules.
- **Labor rules.** Many colleges and universities have unionized workforces, and the rules and policies surrounding union employees can limit options for introducing innovation. For example, union rules generally insist on treating all employees the same in order to ensure a fair baseline. However, that can make it extremely difficult to reward employees who have gone above and beyond or show exceptional initiative.
- **Institutional hiring practices.** As previously discussed, an important way to increase innovation and entrepreneurship within an organization is to hire individuals who demonstrate

that outlook. But outdated and rules-driven hiring practices can limit the options available.

- **Lack of empowerment.** Colleges and universities are sometimes fearful of handing true authority to their employees. This can discourage entrepreneurial employees to the point that they give up and stop investing their passion in the institution. Entrepreneurship is about taking risks, and educational institutions need to take a leap of faith and give employees the power to make consequential decisions.
- **Resistance to change.** Many institutions of higher learning are decades old; some are centuries old. They have their ways of doing things. Change is hard—the old metaphor is that it's like steering an aircraft carrier: It takes a lot of energy to set a new course. Innovators must gather allies, build on small successes, and stay committed to change.
- **Fear of risk.** Colleges and universities have a reputation of standing among the most risk-averse of organizations. Even highly conservative corporations accept a certain level of risk as part of doing business. But many in higher education fear any and all risk and will do everything in their power to prevent their institution from embracing it.

Applying innovative strategies to higher education's adaptive challenges

How can colleges and universities overcome existing barriers to innovation and entrepreneurship and address adaptive challenges? The key is to draw upon strategies that encourage innovation while empowering employees to take entrepreneurial risks.

Participants at the Thought Leaders symposium developed potential strategies to address several major adaptive challenges confronting higher education today. The point of the exercise was not to solve these problems. Instead, the purpose was to propose a process that a campus could use to work toward a solution. Participants wanted to find ways to overcome the problem identified in Section 2 of this report—that most colleges and universities do not have a systematic approach for addressing major adaptive challenges.

Data Point:**Adaptive challenges****Major adaptive challenges facing higher education**

Participants at the Thought Leaders symposium brainstormed the most serious adaptive challenges facing higher education today. They came up with a list of adaptive challenges they believe institutions need to take seriously to secure their futures.

Participants focused on four of these issues, which are briefly discussed here, but the entire list provides an interesting insight into the current state of higher education:

- Disruptive news and social media overreaction.
- Commodification of knowledge.
- Artificial/augmented intelligence.
- Lack of public trust in higher education institutions.
- Affordability.
- Role of faculty.
- Increased legislative oversight.
- Credentialing.
- Declining public funding for knowledge creation and increased reliance on private funds.
- Social connectivity.
- Globalization.
- Changing pedagogy.
- Changing student expectations.

—Source: 2019 APPA Thought Leaders Symposium

1. Disruptive news and social media overreaction**The challenge:**

Institutions can think everything is going well one day and find themselves in a firestorm of media outrage the next. The combination of the 24-hour news cycle and ubiquitous social media can turn what might have seemed a manageable problem into a crisis receiving nationwide—even international—attention. It can happen to any college or university, and it can be remarkably damaging to the institution's reputation. Rather than waiting for disaster to strike, institutions should take steps to proactively manage social media and respond to crises.

The process:

- **Acknowledge and assess the challenge.** Campus leaders might believe it could never happen to them, but it can. Senior institutional leaders need to recognize the threat to the institution and plan to take immediate action if the college or university finds itself a target.
- **Create a community of practice to study the issue.** Recall that a community of practice is an innovation strategy in which individuals from across the institution focus on a particular issue; these communities are designed to create, share, and apply knowledge. This community should work to understand the pressures of modern media and research best practices for proactively managing an institution's reputation.
- **Develop processes, protocols, and education strategies.** The community of practice should work with critical leaders in the institution, such as the media relations department leadership, to improve information literacy within the campus community. The team should also create a crisis communications strategy that establishes lines of communication and outlines potential responses. Since time is of the essence in these crises, the institution needs to empower key employees to make decisions and take risks on behalf of the college or university.

2. Commodification of knowledge**The challenge:**

Higher education once held the key to advanced knowledge. Today, knowledge and information are widely available, even for free, and individuals no longer require colleges or universities to learn what they need or want to know. Institutions must reassess their role in society and understand what value they bring to this new world.

The process:

- **Acknowledge and assess the challenge.** Many colleges and universities may not recognize that the commodification of knowledge is a challenge that could affect them. But since this challenge has the potential to disrupt higher education in a significant way, institutions should strive to wrestle with the problem and assess how it could shape their future.

Data Point:**Innovation in higher education*****Promoting a culture of innovation***

“A culture of innovation at a college or university begins with an understanding that the status quo is not sufficient for continued success or viability. While the institution’s mission may still have value, the new environment for higher education requires fresh approaches for delivering that mission.

“In this new setting, a culture of innovation prizes and rewards creative thinking. It empowers constituents—staff, faculty, administration, students, and community members—to think creatively about solutions and to implement them. It also embraces risk and failure as integral aspects of innovation. It even rewards failures following good attempts—‘shots on goal’—to motivate the continued effort to develop new ideas...

“A culture of innovation requires boards and chief executives to work and think together about opportunities and risks. The governing board, as the ultimate fiduciary in any institution or system, must demonstrate leadership by conveying trust in its institution’s leaders despite the inherent risks associated with innovation. The board should show a willingness to be nimble, add value to both strategy and supportive policies, offer recognition, and ensure appropriate investments—both large and small—in support of change.”

— *AGB Board of Directors’ Statement on Innovation in Higher Education*, Association of Governing Boards of Universities and Colleges, 2017.

- **Create a community of practice to study the issue.** As is the case with disruptive news, an important strategy for the institution is to bring together experts from across the institution so they can work to better understand the challenge of commodification. Building a solid base of knowledge will allow the college or university to take its next steps based on real information.
- **Create opportunities for innovation to thrive.** The institution might decide it needs to develop new courses, programs, or formats to address the commodification of knowledge head-on. It

will be important to allow for creative thinking, experimentation, and iteration. There will be some failures along way, and those failures can’t be allowed to derail the entire process. Strategies such as sandboxing or creating an innovation fund would give experimenters opportunities to try out their ideas and protect them from forces in the institution that want to eliminate risk and discourage innovation.

- **Evaluate existing business models and create new ones.** New ways of thinking about knowledge and learning create an opportunity for colleges and universities to evaluate their business model. The institution can then consider new business models that would tap the college or university’s core strengths and add value for students, researchers, investors, and/or the community.

3. Artificial/augmented intelligence**The challenge:**

Technology is rapidly moving to the point that artificial and augmented intelligence is a real factor in everyday life. Colleges and universities could see staff or even faculty replaced by new “smart” systems, while those who remain will need new skills to manage these advanced systems. New technology could allow for highly personalized forms of education, tailored specifically to a student’s skills and previous knowledge—however, it could also standardize knowledge and negatively impact creativity and critical thinking among both students and faculty.

The process:

- **Acknowledge and assess the challenge.** AI might seem to many campus leaders to be so far from their daily reality that it is not perceived as a potential disruptor. Those most aware of trends in advanced technology should seek to educate the campus about the potential scope of artificial and augmented intelligence.
- **Create a community of practice to study the issue.** Since the field is changing so rapidly, colleges and universities should implement ways to regularly assess the state of technology and update the institution. This might be a good role for a community of practice dedicated to keeping informed about trends and issues in AI.

- **Assign responsibility.** An amorphous challenge like artificial and augmented intelligence can easily fall through the cracks. Institutions should designate an individual or team as responsible for maintaining a big-picture view of AI and addressing challenges as they arise.
- **Find opportunities to innovate.** AI has the potential to make positive changes on campus as well as negative ones. Colleges and universities should consider ways to encourage innovation and experimentation with AI. Since the technology can so easily reach across institutional boundaries, an innovation center focused on artificial and augmented intelligence could become a forum for the institution to invest in AI.

4. Lack of public trust in higher education institutions

The challenge:

Multiple forces are threatening the public's sense of trust in the value, significance, and role of higher education. Society increasingly treats an undergraduate degree as a necessary prerequisite for employment, but this emphasis narrows attention on marketable skills and devalues broader goals such as cultivating critical thinking, advancing scientific knowledge, or encouraging responsible citizenship.

The process:

- **Acknowledge and assess the challenge.** Many in higher education have a general sense of the growing lack of public trust in higher education and/or the value of a degree; but to tackle this problem, it needs to be clearly defined. Campus leaders need to engage with the problem and take seriously the potential for this challenge to disrupt their institution.
- **Create a community of practice to study the issue.** Clearly breaking down the lack of trust in higher education and looking at root causes will give the campus a place to start in solving the problem. It will be essential to look beyond the campus community and draw on the expertise of K-12 educators, local employers, community leaders, and alumni, since these are the people who could be losing their faith in the traditional role of higher education.

- **Innovate solutions.** It will take creative thinking to change attitudes about higher education, even within one community. Institutions need to be honest about their limitations but ambitious about what they can achieve. It will be critical to protect the process of innovation from those within the organization that resist change or believe nothing can be done to change the current course. Exactly what form that innovation will take is hard to predict, and colleges and universities might want to work on more than one path at the same time; for example, a strategy designed for parents could be very different than one targeted at employers. To support these efforts, traditional research and development could be carried out simultaneously along with sandboxing or investment in an innovation fund—whatever is necessary and possible for the institution.

Data Point:

Innovation in higher education

Getting innovation right

"Of all the solutions that have regularly been offered to tackle the problems facing higher education today, perhaps no term is as popular as 'innovation.' But what does it mean? Can it really make a difference, and if so, how?..."

"A central but often overlooked lesson is that innovation comes in different flavors and takes a variety of forms. [While highly disruptive strategies can lead to change,] more evolutionary or 'radically incremental' approaches also offer fresh solutions to systemic issues. As Randy Bass, Georgetown's vice provost of education, has [said], useful strategies will almost certainly need to draw from modular, often technology-driven disruptive forces as well as from the need for integrated, whole learning experiences.

"In short, to be effective, innovation must make sense and fit the context to which it is applied. It is imperative to inspire institutional innovation and to engage with thoughtful critics. Every campus includes both. What is needed is a well-conceived innovation process that is connected to an institution's historical strengths, current needs, realistic strategies and aspirations for the future."

— Kate Ebner and Noah Pickus, "The Right Kind of Innovation," *Inside Higher Ed*, July 25, 2018.

Section 5:

Applying an innovative and entrepreneurial mindset to higher education facilities' adaptive challenges

Innovation and entrepreneurship lessons for higher education facilities

Moving the discussion specifically to the facilities organizations of colleges and universities, participants at the Thought Leaders symposium believed their operations could develop powerful new strategies with an innovative and entrepreneurial mindset. Three points quickly emerged from the discussion:

1. **The importance of mission.** The facilities officers attending the symposium agreed that it's

sometimes difficult to connect employees to the mission of the institution. The day-to-day work of keeping a campus up and running requires enormous effort and concentration. It's easy to lose sight of broader issues when caught up in everyday challenges. Yet connecting that daily work to the overall goals of the institution is critical to innovative and entrepreneurial thinking. Participants discussed how they could involve the campus mission in staff meetings and other typical employee interactions.

2. **The challenge of accepting risk.** Thought Leaders participants agreed that one of the

Data Point:

Innovation in higher education facilities

Remaking the facilities organization at OSU

Oklahoma State University (OSU) faced a monumental organizational challenge: Their physical plant had been operating under the same processes, procedures, and organizational chart for more than 30 years. The outdated organization was overwhelmed, exhausted from complaints, and suffering from low morale. The university's solution was the Next Level Initiative, intended to remake the entire department.

The process began with extensive strategy sessions that drew on APPA's Operational Guidelines and Facilities Performance Indicators as well as the input of peer organizations, advice from a consulting firm, and, critically, the knowledge of facilities employees. Senior management threw their support behind the project, and a robust communications strategy kept all stakeholders informed during the transformation.

A key part of the process was a shift in the culture of OSU facilities management to emphasize accountability, inclusion, and ownership of work. For example, the department instituted a "see-it fix-it" program, where employees are encouraged to create work orders when they notice problems around the campus. The new zone structure created new opportunities for advancement across zone teams, and new management processes were instituted to reward creativity and innovation.

The program succeeded from the start. The department has seen productivity gains and improved focus on preventive and planned maintenance. Customer satisfaction has improved, and employee satisfaction is up. APPA awarded OSU the Effective and Innovative Practices Award in 2017 in recognition of the creative transformation of the department and its culture.

most difficult aspects of innovation and entrepreneurship is the element of risk. Colleges and universities are cautious institutions that shy away from anything perceived as a gamble. But too much risk avoidance means taking power away from employees to make meaningful decisions; it shuts down experimentation and penalizes the sort of failures that are really steps toward long-term success. Facilities leaders need to consider how they can empower their employees and give them permission to fail. They also need to work with the leaders of the institution to encourage more acceptance of reasonable risk across the institution.

3. **The need to manage both up and down.** It is natural that facilities leaders focus on how they can bring more innovation and entrepreneurship to their teams. However, they should also think about how they can affect those above them on the campus organizational chart. Bold steps from facilities organizations can influence the mindset of senior campus leaders and shape the future of the entire college or university.

Applying innovative strategies to higher education facilities' adaptive challenges

Participants at the Thought Leaders symposium further explored innovative and entrepreneurial strategies by applying them to four major adaptive challenges facing higher education facilities today. As with the previous exercise, the point was not to solve these problems but rather to suggest a *process* that institutions could use to address these challenges.

- **Changing learning modalities.** Approaches to teaching and learning are rapidly evolving, and these approaches shape the built environment of the campus. While institutions previously relied on traditional classrooms and stadium-style lecture halls, today seminar-style rooms with flexible seating and integrated technology are in high demand. But renovations are costly, and facilities organizations must balance competing demands and cope with shrinking budgets. How can the facilities organization adapt to changes in pedagogy while satisfying other campus needs and controlling costs?

Data Point:

Adaptive challenges

Major adaptive challenges facing higher education facilities

Participants at the Thought Leaders symposium brainstormed the adaptive challenges facing higher education facilities organizations today. They came up with a list of challenges they believe institutions need to take seriously to secure the future of the campus.

Participants focused on four of these issues, which are briefly discussed here, but the entire list provides an interesting insight into the current state of higher education facilities:

- Changing learning modalities.
- Artificial/augmented Intelligence.
- Workforce skills gap.
- Student expectations.
- Regulatory and legislative challenges.
- Energy demands and sources.
- Demands for increased accountability and transparency.
- Declining resources.
- Aging infrastructure.
- Sustainability.
- Competing priorities.
- Acceleration in technological innovation.

Thought Leaders participants suggested the following process:

- **Develop a community of practice to understand evolving learning modalities.** The community should draw on expertise across the campus and focus on how teaching is changing within the institution.
- **Connect to the mission.** The facilities organization should view shifts in pedagogy in the context of the institution's mission and vision. Keeping the mission in view will help the department prioritize its efforts.
- **Create space for innovation and experimentation.** Facilities leaders should look for opportunities to experiment with new classroom designs and learning spaces. There will be risk involved in the sense that the institution will need to invest in a design that may or may not succeed, so the facilities

organization should take steps to protect the risk-takers. The process should include opportunities for experimentation, prototyping, and assessment by a wide range of stakeholders.

■ **Artificial and augmented intelligence.** The facilities organization has the potential to be significantly impacted by AI. Increasingly popular smart building systems that incorporate the Internet of Things will increase automation of core tasks across the campus—from sophisticated energy monitoring to garbage pickup. This change could result in significant cost savings and reduce system failures, but it will create new challenges for the facilities staff who must maintain increasingly advanced technology. How can the facilities organization move forward with AI in a responsible way?

- **Focus on mindset.** Facilities leadership should emphasize an open mindset that encourages entrepreneurship, ownership, and

passion. It's easy to dig in and insist that things should be done the way they've always been done, but this sort of closed attitude will limit opportunities. Facilities leaders should look for the employees who are committed to the institution, invested in the department's success, and eager to explore new technology. They should give these employees opportunities to take risks and allow them permission to fail.

- **Connect to the mission.** Remember that the goal shouldn't be new technology for the sake of new technology. The mission of the college or university and the strategies of the facilities department as expressions of that mission should drive decision-making. Leaders should only support or implement projects that advance that mission and strategy.
- **Create space for innovation and experimentation.** The facilities organization should find a defined area—perhaps a build-

Data Point:

Innovation in higher education facilities

Business model innovation at Michigan State University

In 2009, the Michigan State University (MSU) Landscape Services department had a problem. A 10-percent across-the-board budget cut had created a \$180,000 shortfall. The department needed a way to make up that funding or the campus and grounds would suffer.

Adam S. Lawver, then supervisor with landscape services, was tasked with making up the deficit. He and his team looked at several challenges facing the facilities department, including the need for a new area to store topsoil and mulch for landscaping projects and an area to store stone for construction projects. MSU created a single location for storage of all these materials, allowing multiple departments to combine their inventory of parts, tools, and vehicles. This went a long way toward eliminating the department's budget problems.

One of the materials being stored was stone and crushed concrete used as a subbase in

construction projects. The team realized it could create its own subbase by recycling concrete from campus demolition projects. Installing their own concrete recycling system allowed the department to cut costs, since concrete was previously hauled away by a vendor; the new system also reduced the amount of construction waste going to the landfill.

Today the business has grown into a \$4 million operation that procures and recycles construction supplies for the campus. MSU has saved more than \$1.2 million in construction costs to date by purchasing supplies in bulk and issuing them to projects for contractors to install. It's a great example of an institution rethinking its existing business model and finding new ways of supporting the campus mission.

For information on the MSU business plan, contact Adam Lawver at lawverad@msu.edu.

ing or part of campus, or maybe a building system—where innovation and experimentation are permitted and protected. Facilities should engage all the stakeholders and get them on board, and then create a sandbox where new AI systems can be explored.

- **Workforce skills gap.** Colleges and universities are struggling to find employees with the right skills for the job. Skilled tradespeople are retiring in large numbers, but those with the qualifications to replace them are in short supply. Competition for trades is high, and institutions often find it difficult to match salaries. How can the facilities organization find the employees it needs to keep the campus running at its best?
 - **Focus on mindset.** Facilities leadership should structure their hiring process to emphasize attitude over skillset. If the institution's hiring practices don't support this approach, facilities officers need to work with their human resources department to find a way to bring new flexibility to the process. Can you work together to create a pilot program that brings in enthusiastic new employees and then trains them to give them the skills they need?
 - **Connect to the mission.** Facilities leaders should emphasize the mission of the institution as one of the pluses of working for a college or university. These advantages can be of significant value, including tuition benefits and job security. However, it should be clear that one of the advantages of employment in higher education is a connection to an educational institution that plays an important role in the community.
 - **Explore innovative recruitment and training strategies.** Institutions often wait for the right people to come to them. Instead, colleges and universities should explore innovative options for finding and training staff. Should you partner with local community colleges? Should you develop a program to welcome military personnel transitioning to civilian life? Should you work with local high schools? Should you connect with immigrant communities in your area? Should

you reward employee progress with badges, credentials, bonuses, or pay raises?

- **Student expectations.** Students want a great deal out of their higher education experience. They are counting on a degree to safeguard their future and often feel enormous pressure to succeed. First-generation students often need help navigating the college experience, while non-traditional students struggle with the typical format of higher education. Meanwhile, fitness centers, libraries, and sports facilities have become showcases on college tours and subject to the pressure of the higher education “arms race,” and some students—no question about it—expect all the comforts of a five-star resort in their residence halls. How do facilities organizations meet the growing and often conflicting needs of students in this era of shrinking budgets?
 - **Focus on mindset.** It's easy for the facilities organization to feel beleaguered by student expectations. There's an air of frustration at the demands placed on facilities and a sense that students are being unreasonable. This is understandable—but unhelpful. Facilities leaders need to reset the mindset of the organization in order to be more open to student needs.
 - **Engage with students.** It's easy to assume what students want, but the facilities organization won't really know until it asks them and really listens to what they say. The organization should experiment with different ways to engage with students and draw on the expertise of those across the institution who work with students on a daily basis. A community of practice created to understand student expectations might be a good strategy, especially one that includes representatives from student affairs, residential services, and admissions.
 - **Connect to the mission.** Obviously, not everything that students want or need is possible, and the facilities organization needs a way to decide next steps. Tying the organization's response to the mission of the institution is not only a smart way to make choices, but also to explain those choices to students and other stakeholders.

- **Create space for innovation and experimentation.** Facilities organizations need the freedom to experiment and to discover which responses to student expectations will succeed. What is the best way to accommodate veterans? To help first-generation students navigate a college or university campus? To encourage interaction across disciplines? There's not one simple answer to these

questions, so senior facilities officers need to create spaces where ideas can be tested, evaluated, and refined. Allow for risk in these spaces, and don't be afraid to fail. Make it clear to campus leaders that this process will take time and emphasize that the final result will be more effective because it was allowed to emerge organically.

Section 6:

Questions for Campus Discussion

It has always been a goal of the APPA Thought Leaders series to encourage discussion and debate on campuses across North America. Participants at the symposium developed the following questions about how facilities can encourage innovation and entrepreneurship on their college or university campuses.

We encourage readers to share these questions within their facilities organization and across campus departments. They should help generate ideas on ways that your college or university can develop strategies to address major adaptive challenges, “think outside the box,” and see things differently.

1. How does your college or university identify major adaptive challenges? Does it have a process in place for meeting these challenges? Is that process effective? How could you and your department work toward creating or improving such a process?

As previously discussed, it’s not hard to recognize technical problems when they appear. A snowstorm is obvious; a ransomware attack is impossible to miss. But deeper, more systemic, adaptive challenges can sneak up on you. They are big and hard to grasp, and they pose such a threat to the status quo that many people look away rather than engage with them.

As hard as it might be, prepared institutions will tackle adaptive challenges head-on. If your institution has a process in place to identify these challenges, how effective is that process? If not, can you make the case for developing such a process? This could be an excellent opportunity to employ an entrepreneurial mindset and take ownership of significant challenge. Who can you partner with across the institution to analyze potential disruptive challenges and strategize solutions?

Data Point:

Entrepreneurship and higher education

The role of intrapreneurs in higher education innovation

“While calls for change in higher education are loud, discourse on *intrapreneurship*—aptly defined by Pamela Hartigan and Charmian Love as ‘internal change agents... who embrace the characteristics of entrepreneurs but work within large organizations’—as a possible solution is much quieter. In fact, it is too quiet for our liking. Higher education organizations maintain a stodgy and bureaucratic reputation, but empowered intrapreneurs present an opportunity for them to evolve and thrive in an increasingly competitive market....”

- 1. “Seek to understand before you seek to change.** Intrapreneurs—in contrast to entrepreneurs—must work within an existing system. To be a change leader within an organization, it is important to respect and understand what has come before you....
- 2. “Launch initiatives that respond to a demonstrated need and align with institutional mission.** We have learned to leverage both positive and negative situations—when our institution is celebrated or criticized—to reflect on the status quo, and assess how and whether we can improve....
- 3. “Figure out when to step up, step in, and step aside.** Developing an intrapreneurial style can feel more like an art than a science, but intrapreneurs can learn to identify and respond to patterns from the people, organizations, and initiatives in their network.”

— Jacqueline Smith, Nikki Gusz, and Ryen Borden, “Intrapreneurship for Higher Education Reform: Three Lessons for Intrapreneurship’s Emerging Community of Practice,” *Stanford Social Innovation Review*, August 15, 2014.

2. When confronting a major adaptive challenge, what types of innovative strategies would be most effective on your campus?

It's hard to develop a process for addressing an adaptive challenge without identifying the challenge, but institutions can develop a menu of potential strategies that would be effective. The culture and organization of different colleges and universities will shape which strategies will be a good fit. One institution could embrace open innovation, in which every campus unit is encouraged to be as creative as possible; for others, creating a traditional research and development department would be a better plan.

Consider how much risk your organization is willing to take. If the institution's tolerance for risk is low, you might need to create a protected space where experimentation is allowed. A greater acceptance of risk could allow for bigger ventures—an innovation center, for example. Thinking through the options will allow the college or university to make preliminary plans that can be put into action when an adaptive challenge arises.

3. Where does innovation and entrepreneurship already thrive on your campus? What can you learn from the experience of that team, department, or unit?

Even the most cautious colleges and universities usually have pockets of innovation. Some are in what might be considered obvious places—the theater department, for example, or the school of art. But charismatic leaders or a particularly creative team can spark innovation in all sorts of academic units and administrative offices.

Think about where innovation is alive and well on campus and seek out the insights of those leading it. Ask how they've overcome institutional barriers and created a culture of ownership and entrepreneurship. Can they become mentors as you seek to increase innovation within your department and across the institution as a whole?

4. What barriers stand in the way of innovation and entrepreneurship on your campus? Within your department? How do you work around these barriers, adapt to them, or eliminate them?

Some organizations are known for their innovative and entrepreneurial attitudes—think of Silicon

Data Point:

Promoting innovation in higher education

Creating a culture of innovation

"The term 'innovation' is overused, under-defined and often means something different depending on who you ask. In order to build a culture that champions and supports innovation, it's critical that each organization develops a shared definition of what innovation means within the context of its work....

"We offer this shared definition of what 'culture of innovation' can mean within an educational context. Feel free to use this definition as a starting point for your own work with your organization.

"Innovation: The act or process of building on existing research, knowledge, and practice through the introduction of application of new ideas, devices, or methods to solve problems or create opportunities where none existed before.

"Culture: The way of thinking, behaving, and working that exists in an organization, such as universities and community colleges.

"Culture of Innovation: Nurturing an environment that continually introduces new ideas or ways of thinking, then translates them into action to solve specific problems or seize new opportunities."

— Jacqueline Smith, Nikki Gusz, and Ryan Borden, "Intrapreneurship for Higher Education Reform: Three Lessons for Intrapreneurship's Emerging Community of Practice," *Stanford Social Innovation Review*, August 15, 2014.

Valley start-ups. Colleges and universities are usually less adventurous. But remember this: The inherent conservatism of higher education is regularly overcome by brave thinkers who build bold new programs, make remarkable scientific and technological discoveries, and find new ways of thinking and learning. The same passion and creativity should be applied outside of the classroom and lab as well as inside.

If that isn't possible at your college or university today, the institution needs to find out why. Look for the cultural barriers to innovation as well as the

processes—both formal and informal—limiting entrepreneurship. Do individuals within the organization feel connected to the mission of the college or university? Are they empowered to take risks? Are they encouraged to take ownership of their work? If not, how do you carve out opportunities for risk-taking and entrepreneurship? Can you create safe corners of the institution where experimentation is allowed?

5. How can your institution or department better encourage an innovative and entrepreneurial mindset? How can you promote ownership and risk-taking?

Experts on innovation and entrepreneurship agree that these skills can be practiced within any type of organization—even large, heavily regulated, higher education institutions. Ultimately the key is mindset and passion, and anyone who takes ownership of their work is, in some way, an entrepreneur. Each of the participants at the Thought Leaders symposium walked away feeling personally challenged to be more innovative and entrepreneurial, and they issue the same challenge to readers. How can *you* tap into your passion, connect to the mission of the institution, and take ownership of your work?

The next step is to encourage this mindset among others, both up and down the organizational chart. Individuals in positions of leadership can make a real difference in the lives of their employees by allowing them to take risks and make mistakes. They can also promote a new mindset among their colleagues and senior campus leaders. This involves some risk, certainly, but passion is highly persuasive and can ultimately convince even hardened skeptics to give innovation a chance.

6. How can the college or university better communicate its mission and help connect employees across the institution to that mission?

We've seen again and again that connecting to the mission of the institution is a powerful tool for encouraging innovation and entrepreneurship. How well does your campus communicate its mission? Do employees feel a connection to that mission? If the answer is no, how can you make that connection more significant for your employees?

The connection needs to be genuine and heartfelt. Sticking the mission on a coffee mug or putting it on a poster merely pays lip service to the idea. Campus leaders need to be authentic in their expressions of connection and communicate their true passion to their employees. When others see someone living out their passion for their institution, they immediately recognize it and can be inspired in spite of themselves.

Data Point:

Fostering innovation and entrepreneurship

The importance of mission

"The role of missions in...change processes is complex, but central. Academic leaders must always work within the deeply engrained traditions and values of their institutions, but they also must always work with an eye to adaptation, survival, and improving health and effectiveness. Written mission statements can provide guidance, as can informal stakeholder understandings of what sometimes abstract mission statements mean for day-to-day decisions. Those words and understandings can constrain choices on a campus, but considered creatively they also can buttress a leader's case for re-envisioning and re-interpreting organizational identity to fit new conditions."

— James C. Hearn, Jarrett B. Warshaw, and Erin B. Ciarimboli, *Strategic Change and Innovation in Independent Colleges: Nine Mission-Driven Campuses*, The Council of Independent Colleges, April 2016.

7. How can your institution or organization go about hiring, promoting, and rewarding innovative, entrepreneurial staff? What process or procedures would need to be changed to make this possible?

Consider how your college or university goes about hiring new staff. What does the organization look for in candidates, and what sorts of soft skills are ignored? Experts agree that passion is key to fostering innovation and entrepreneurship, and your institution is limiting its own potential by ignoring it when hiring.

Take a close look at your hiring process and consider ways that you can make passion and a sense of ownership higher priorities. If the institution's policies

are limiting your choices, work with the human resources department to find ways to change those policies or work around them.

Data Point:

Promoting innovation in higher education

Higher education as a business—and a calling

"Higher education faces a dilemma: We undoubtedly need the more sophisticated administrative leadership...including being smart about generating revenue. We must also be true to our roots in educating young people, seeking the truth, helping communities, and preserving the most important values of our culture. We need to find our way back to our academic center of gravity without losing the administrative capacities so crucial to the health of our institutions and the effective pursuit of our missions.

"Three things will help secure the needed balance: First, those involved in preparing and selecting college presidents must remember the importance of moral and intellectual leadership as well as administrative sophistication in designing training programs and evaluating candidates.

"Second, presidents must make sure their strategies are driven primarily by educational and social purposes, even as those presidents attend to the financial well-being of their institutions.

"Third, those who represent academe to the public, including admissions and financial-aid officers, creators of websites and print materials, and the presidents, trustees, and association leaders who speak for us, must focus relentlessly and credibly on our commitment to the students we enroll and the communities in which we are embedded.

"Our work is a calling. We must remember this ourselves and present our work this way to nonacademic audiences. We neglect this imperative at our peril."

— Richard M. Freeland, "Yes, Higher Ed Is a Business—but It's Also a Calling," *The Chronicle of Higher Education*, March 18, 2018.

Section 7: *Conclusion*

Transformational change of the sort we have described in this monograph will never be easy. Resistance to change is a powerful force. Yet, we have seen in these pages that an innovative and entrepreneurial mindset can indeed help us to see things differently and inspire us to embrace creative solutions to an institution's major adaptive challenges.

We conclude with the same question we started with: How do you think outside the box? Participants in the Thought Leaders symposium came up with some good answers:

- By cultivating a mindset that is open to change.
- By looking at our organizations with a deliberately different perspective.

- By taking ownership of our work and embracing risk.
- By hiring for passion as well as hiring for skills.
- By engaging with others and really listening to what they have to say.
- By protecting experimentation and permitting failure.
- By connecting to the mission of the organization.

No, it's not easy. But the reward will be an institution ready to meet the adaptive challenges of the 21st century and excited to deliver its mission to a new generation of students.

Appendix A: Bibliography/Resources

- AGB Board of Directors' Statement on Innovation in Higher Education. Association of Governing Boards of Universities and Colleges, 2017. https://agb.org/wp-content/uploads/2019/01/statement_2017_innovation_0.pdf
- APPA. *Thought Leaders Report 2018: The Landscape, Framework, and Strategies for Managing & Mitigating Risk*. APPA/Center for Facilities Research, 2018.
- . *Thought Leaders Report 2017: Transforming Facilities to Achieve Student Success*. APPA/Center for Facilities Research, 2017.
- Arbinger Institute. *Leadership and Self-Deception: Getting Out of the Box*. Oakland, California: Brett-Koehler Publishers, Inc., 2010.
- . *The Outward Mindset: Seeing Beyond Ourselves*. Oakland, California: Brett-Koehler Publishers, Inc., 2016.
- Brandenburger, Adam. "To Change the Way You Think, Change the Way You See." *Harvard Business Review*, April 16, 2019. <https://hbr.org/2019/04/to-change-the-way-you-think-change-the-way-you-see>
- Brewer, Dominic J. and Maurice Shirley. "Federal Policy to Promote Innovation in US Higher Education." *Urban Institute*, September 19, 2017. <https://www.urban.org/research/publication/federal-policy-promote-innovation-us-higher-education>
- Brodnick, Robert. *Innovations in Strategy Crafting*. Sierra Learning Solutions, 2018.
- Brown, Justine. "Bringing Innovation to Procurement." *Government Technology*, March 4, 2014. <https://www.govtech.com/budget-finance/Bringing-Innovation-to-Procurement.html>
- Ebner, Kate and Noah Pickus. "The Right Kind of Innovation." *Inside Higher Ed*, July 25, 2018. <https://www.insidehighered.com/digital-learning/views/2018/07/25/yes-higher-ed-needs-innovation-it-should-be-right-kind-opinion>
- Eshleman, Kristen. "Emergent EDU: Complexity and Innovation in Higher Ed." *EDUCAUSE Review*, May 7, 2018. <https://er.educause.edu/articles/2018/5/emergent-edu-complexity-and-innovation-in-higher-ed>
- Flanagan, Christine. "Business Model Innovation: A Blueprint for Higher Education." *EDUCAUSE Review*, November 1, 2012. <https://er.educause.edu/articles/2012/11/business-model-innovation--a-blueprint-for-higher-education>
- Freeland, Richard M. "Yes, Higher Ed is a Business—But It's Also a Calling." *The Chronicle of Higher Education*, March 18, 2018. <https://www.chronicle.com/article/Yes-Higher-Ed-is-a-Business/242852>
- Gino, Francesca. "The Business Case for Curiosity." *Harvard Business Review*, September-October 2018. <https://hbr.org/2018/09/curiosity>
- Gladwell, Malcolm. *Outliers: The Story of Success*. New York: Little, Brown and Company, 2008; Back Bay Books, 2011.
- Hanekom, Johan. "Seven Ways to Foster Innovation in Your Company." *Entrepreneur*, September 21, 2016. <https://www.entrepreneur.com/article/282664>

- Hearn, James C., Jarrett B. Warshaw, and Erin B. Ciarimboli. *Strategic Change and Innovation in Independent Colleges: Nine Mission-Driven Campuses*. The Council of Independent Colleges, April 2016. https://www.tiaainstitute.org/sites/default/files/presentations/2017-02/strategic_change_innovation_independent_colleges.pdf
- Heifetz, Ronald A. and Donald L. Laurie. "The Work of Leadership." *Harvard Business Review*, January-February 1997.
- . *Leadership on the Line: Staying Alive Through the Dangers of Leading*. Harvard Business School Press, 2002.
- Heifetz, Ronald A. and Marty Linsky. "A Survival Guide for Leaders." *Harvard Business Review*, June 2002. <https://hbr.org/2002/06/a-survival-guide-for-leaders>
- Konnikova, Maria. *Mastermind: How to Think Like Sherlock Holmes*. New York: Viking, 2013.
- Magda, Andrew J. and Jill Buban. *The State of Innovation in Higher Education: A Survey of Academic Administrators*. A Joint Project of the Learning House, Inc. and the Online Learning Consortium, April 2018. <https://olc-wordpress-assets.s3.amazonaws.com/uploads/2018/04/The-State-of-Innovation-in-Higher-Education-A-Survey-of-Academic-Administrators.pdf>
- Medlin, E. Lander. "Risky Business: Risk Management for Higher Education Facilities." *Facilities Manager*, July/August 2018. <https://www1.appa.org/FacilitiesManager/article.cfm?ItemNumber=4243&parentid=2729>
- "Oklahoma State University Facilities Management: The Next Level Project: A Model for Effective Change." APPA: Effective and Innovative Practices Award Application, 2017. <https://www.appa.org/effective-and-innovative-practices/>
- Pink, Daniel H. *When: The Scientific Secrets of Perfect Timing*. New York: Riverhead Books, 2018.
- Pisano, Gary P. "The Hard Truth About Innovative Cultures." *Harvard Business Review*, January-February 2019. <https://hbr.org/2019/01/the-hard-truth-about-innovative-cultures>
- Renn, Aaron M. "Six Forces Disrupting Higher Education." *Manhattan Institute*, June 6, 2018.
- Ries, Eric. *The Lean Startup: How Today's Entrepreneurs Use Continuous Innovation to Create Radically Successful Businesses*. New York: Crown Business, 2011.
- Setser, Bryan and Holly Morris. *Building a Culture of Innovation in Higher Education: Design & Practice for Leaders: Emerging Lessons and a New Tool*. 2Revolutions and EDUCAUSE, April 16, 2015. <https://library.educause.edu/-/media/files/library/2015/4/ngt1502-pdf.pdf>
- Smith, Jacqueline, Nikki Gusz, and Ryen Borden. "Intrapreneurship for Higher Education Reform: Three Lessons for Intrapreneurship's Emerging Community of Practice." *Stanford Social Innovation Review*, August 15, 2014. https://ssir.org/articles/entry/intrapreneurship_for_higher_education_reform#
- Wenger, Etienne C. and William M. Snyder. "Communities of Practice: The Organizational Frontier." *Harvard Business Review*, January-February 2000. <https://hbr.org/2000/01/communities-of-practice-the-organizational-frontier>
- Williams, David K. "The 4 Essential Traits of 'Intrapreneurs.'" *Forbes*, October 30, 2013. <https://www.forbes.com/sites/davidkwilliams/2013/10/30/the-4-essential-traits-of-intrapreneurs/#2f0f62dc51da>

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- *Thought Leaders Report 2006: University Facilities Respond to the Changing Landscape of Higher Education*
- *Thought Leaders Special Report: Educational Facilities Professional's Practical Guide to Reducing the Campus Carbon Footprint (2008)*

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