

# Campus 2025

The Enrollment Leader's Guide to Trends in Residence, Active Learning, and Maker Spaces

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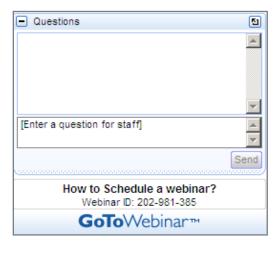




# Questions Panel and Minimizing GoToMeeting

## **Asking a Question**

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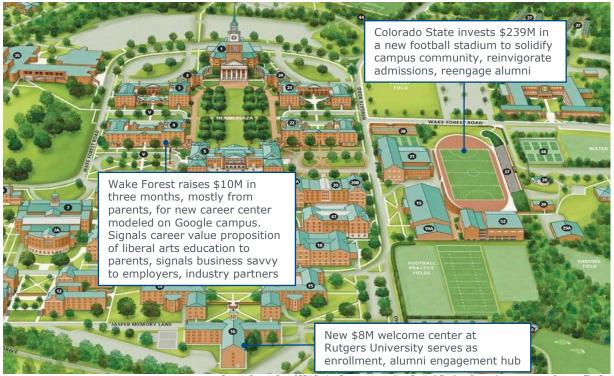
## **Minimizing and Maximizing Your Screen**



- Use the orange and white arrow to minimize and maximize the GoToMeeting panel.
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# Many Institutions Making Big Investments in Space





Source: Denver Post, "CSU Begins Construction on New Football Stadium," www.denverpost.com; Rutgers, The State university of New Jersey, "New Rutgers Visitor Center Alms to Wow Prospective Students," http://news.rutgers.edu; Wake Forest University, Winston-Salem, NC; Enrollment Management Forum interviews and analysis.





## Industry-Wide Changes Placing New Demands on Facilities

New Challenges on Campus	New Questions for Facilities
<b>Student Success</b> Changing demographics and increased reliance on tuition dollars raising the imperative, difficulty of retaining students	<ul> <li>How must classroom space change to improve learning outcomes?</li> <li>What new project, study, and social spaces are needed to increase engagement, retention?</li> </ul>
Career Preparation Unease over job market, scrutiny of college ROI increasing need to prepare students for careers with hand-on work experience, soft skills	<ul> <li>How do campus spaces facilitate partnerships between students and industry?</li> <li>What new spaces are needed to give students the practical skills needed to land a job?</li> </ul>
Amenities Arms Race To attract a limited supply of full-pay students, institutions competing not just on tuition discounting but also attractive facilities	How is student housing changing to appeal to prospective students?
Cross-Silo Admin Collaboration With more competitive business environment, administrative services expected to provide higher level of business support	How can admin space increase collaboration and efficiency between central admin units?
Evolving Research, Funding Stagnant federal funding, rise of multidisciplinary research, uncertainty of future research requirements putting new pressures on lab design	<ul> <li>How do institutions build labs that do not need major overhauls for each new PI?</li> <li>How can lab space further multidisciplinary research?</li> </ul>

# Opaque Future Needs Complicate Design Process

## One University's Struggle to Build Next-Generation Science Building

#### Missteps in the Design Process Add Cost, Delay Completion, Limit Building Functionality

Multiple colleges will use building, complicating planning of building's program Architect adds modern design features that add cost but do not enhance building functionality

Senior leaders reject initial plans for building from steering committee, design process resets After foundation laid, institution realizes additional space needed. Facing budget overrun, institution cannibalizes building infrastructure to cut costs

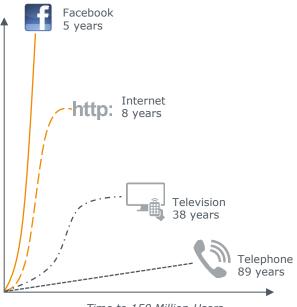
#### Results



- Completed in 10 years instead of planned 5
- Final cost of \$54M instead of budgeted \$29M
- Ongoing heating and cooling challenges because HVAC system downgraded
- Labs not functional to needed specifications upon completion; institution needs to subsequently renovate labs at \$300K each



#### **Rate of Technology Change Accelerating**



### Time to 150 Million Users

#### **Buildings Used to Last Longer...**





**Built 1965** 

First Major Upgrade in 1995

#### ...But New Construction Will Need Regular Upgrades











Built 2017

First predicted upgrade for 2027

## Impacting Campus Facilities on Three Levels

## Design Must Anticipate, Accommodate Rapidly Evolving Technology

#### **Three Levels of Impact on Campus Buildings**



#### Building Infrastructure Technology

New technology provides increased functionality, cost savings, but electronic systems less durable, require higher skilled staff support

#### Example:

Rather than installing purely mechanical HVAC units, HVAC units now rely heavily on software



# Student-Facing Instructional Technology

Classroom tech enhances learning outcomes, but becomes obsolete as better tech emerges

#### Example:

Institutions built computer labs, no longer relevant with the rise of "Bring Your Own Device" (BYOD)



# **External Technology Impacting** Curriculum, Research

Time between major breakthroughs in tech decreasing, with downstream consequences on economy, education programs

#### Example:

Institution builds multi-million dollar trading floor simulator; trading floor jobs declining with proliferation of automated trading

# Difficult to Distinguish Fad from Trend



"The Only Thing Worse Than Being Late Is Being Wrong"

#### **Limited Sources to Turn to for Trend Expertise**



Individual PI advocates for project she feels passionate about, but no proven examples of success



Contracted architects provide helpful guidance on prior construction at other institutions but not experts on future trends



Peer institution facilities already minimum five years removed from current thinking and may not account for campus-specific factors

#### Between a Rock And a Hard Place





Facilities Leader unable to separate trends meriting substantial investment from (eventually) passing fads



Following successful first-movers risks loss of competitive advantage

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# Investing in the Present at Expense of the Future

## Facilities Leaders Must Balance Distinct Immediate and Long-Term Needs

#### **Current Stakeholders Needs**



Faculty want more of the spaces, equipment they have now



Enrollment Manager wants spaces, technology that will impress visiting students and parents



Architect wants to serve faculty, design distinctive features to distinguish building

Various current stakeholder incented to advocate for spaces that achieve short-term goals, which may conflict



Facilities Leader balances potentially conflicting current stakeholder demands, educates building owners on need to factor in long-term building needs

#### **Long-Term Building Needs**



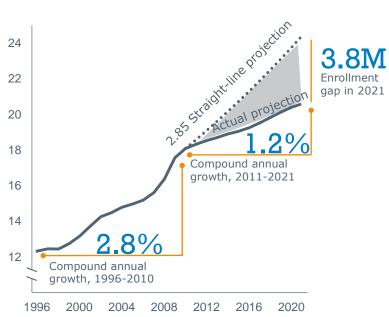
- Strong building shell to minimize future resources spent replacing building systems, infrastructure
- Built-in flexibility for cheaper future programmatic renovations

Facility Leader only role positioned to advocate for long-term building needs and future building users

# Less Wiggle Room

## Revenue Pressures Leading to Tighter Budgets, Trade-Offs

### **Total Fall Enrollment (Millions), 1996-2021 (Projected)**



#### **Compounding Pressures**



State funding declined with recession, has not recovered



Federal research funding has plateaued



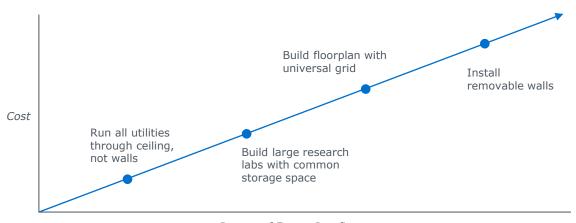
Private giving flatlined during recession; missed 4 years of growth



Construction costs rising along with economic recovery

# The High Price Tag of Future Proofing

## Playbook Is Well Known, but Expensive to Implement



Degree of Future Proofing

### **Reducing the Need For Future Proofing**

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"I know how to future proof, but it's expensive. If I knew where the trend was going, and what kind of building we'll need here in the future, this would save us a ton."

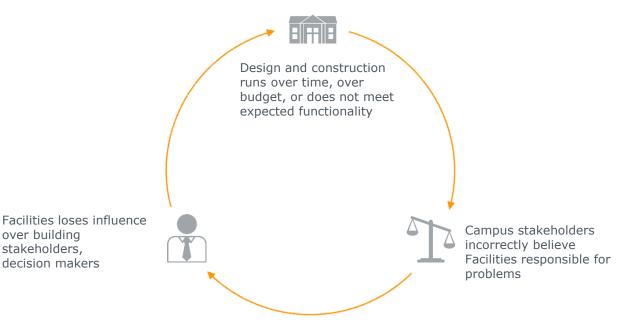
Facilities Leader, Regional Public University



# Poor Design Risks Negative Feedback Loop

Facilities Unit Reputation Key to Influencing Stakeholder Design Decisions

#### Negative Feedback Loop Caused by Perceived Facilities Error



over building

stakeholders,

# Our Focus Today: Campus 2025



## **Evaluating the Most Impactful Trends on Campus Spaces**

**Evolving Spaces** 

Trend #1: Active Classrooms and

Learning Spaces

Trend #2: Community-Centric Student

Residence Halls

**Trend #3**: Corporate-Inspired Offices and

Admin Spaces

Trend #4: Flexible and Shared Research Labs

Emerging Spaces

Trend #5: Makerspaces

**Trend #6**: Industry Interface Spaces

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# **Experimenting With Active Learning Classrooms**









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## **Emphasizing Student Interaction and Ideation**

## Pedagogy Positions Students as Active Participants, Not Passive Recipients



#### **Traditional Lecture**

- 1-2 hours of prepared remarks by faculty
- Students transcribe presented information
- · Limited time for discussion



#### **Active Learning Classroom (ALC)**

- · Opportunity for questions, discussion
- Increases "face time" with faculty, peers
- Project-based learning encourages collaboration

## **Guide to Active Learning Terminology**



- Active Learning Classes: Umbrella term for classes centered on interaction and engagement with course material, often through group work and problem solving. ALCs may incorporate lectures for professors to model skills, complimented with subsequent student practice.
- SCALE-UP¹ Classes: At tables of nine, students first work in groups of three to determine the solution to a problem, then as a table determine the best solution among the three groups, and finally present the table solution to the class and argue for the right answer.
- **TEAL<sup>2</sup> Classes:** Students sit at group tables, each positioned adjacent to a monitor to which students can connect to their electronic devices to share images with peers.
- **Flipped Classes:** Students watch short lectures or lessons and take quizzes to check understanding prior to class. Flipped classes may or may not be active learning classes, depending on how professor capitalizes on the pre-lecture.

<sup>1)</sup> Student-Centered Active Learning Environment

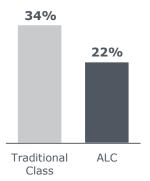
<sup>2)</sup> Technology-Enabled Active Learning



## Good for Students, Good for Institutions

## Evidence Shows Active Learning Boosts Student Learning Outcomes

# Average Course Failure Rate at Multiple Institutions



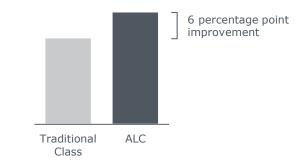
#### **Ancillary Benefits for Institution**



#### **Enrollment Advantage**

Parents (and students) drawn to additional value proposition of interactive classes

#### Average Student Scores on Identical Tests at Multiple Institutions





#### **Increase in Retention**

As student retention increases, institutions capture more student tuition dollars



## UMN Sets Aspiration for Tech-Enhanced, Space-Optimized Learning Facility

#### University of Minnesota's Bruininks Center Sets ALC Gold Standard





## Showcase Facility...

- Houses 10 ALCs, plus student support services and career center
- Classrooms based on UMN research on ideal archetype for ALC
- Group tables adjacent to flat screens for idea-sharing, professor can pull up student screen to main projector screen





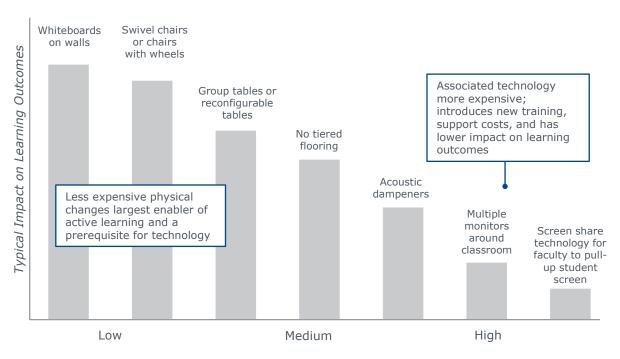
#### ...Serving a Segment of Campus

 Approximately 38% of UMN's 30K undergraduate students took at least one course during the 2014-2015 academic year in the Bruininks Center



# "Learning Spaces Are Not Binary"

## Smaller Physical Changes Have Greatest Impact on Learning Outcomes



Resource Intensiveness

# Getting the Most Bang for Your Buck



## McGill Makes Small, Principled Modifications to Existing Classroom Stock

#### **Excerpt of McGill's Principles for Designing Learning Spaces**

Class- room Function	Layout	Furniture	Technology	•	Other columns include "Acoustics" and "Lighting / Color"
Learning with peers	<ul> <li>□ Promote face-to-face communication (e.g., two rows of students on a tier, small groups)</li> <li>□ Individuals can move about easily</li> <li>□ Unobstructed sightlines</li> </ul>	☐ Flexible seating (e.g., fixed chairs that rotate, movable tables and chairs, tablet chairs on wheels) ☐ Intentional use of furniture of different heights and shapes	□ Shared workspaces (e.g., writable walls, digital workspace)	•	Rubric allows customized adaptation of active learning principles across varied classrooms by considering design elements' impact on classroom functions

#### **Process for Customizing Classrooms**

Facilities Leader meets with building owner to determine importance of different classroom functions



Facilities Unit determines needed custom modifications for each classroom to meet principles on checklist



15%

Of existing classrooms renovated for active learning using rubric

For complete version of McGill's Principles for Designing Learning Spaces, please see appendix.



# Lessons Learned the Hard Way

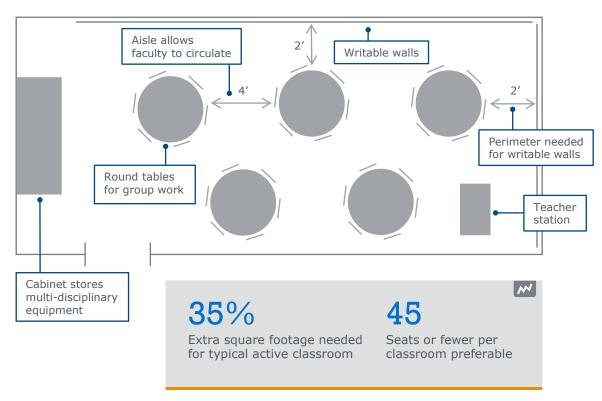
## Granular Considerations for Building Active Learning Classrooms

Element	Description of Advice
Flooring	Students and faculty treat active learning classrooms more causally than traditional lecture halls. Expect students to bring food and drink. Student movement and furniture mobility makes spills more likely. Replace carpet with rubberized solid surface with stain resistant, sound absorbing qualities to reduce custodial cleaning.
Baskets on Chairs	Given the high level of student movement in class, bags and coats pose safety risks and inhibit mobility if they block aisles. Furnish chairs with metal baskets underneath where students can store personal items and keep the aisles clear.
Acoustics	Multiple simultaneous conversations, as opposed to one lecture, can create a distracting environment. This is exacerbated when carpets are necessarily removed. Install acoustic panels to absorb sound and accommodate multiple student conversations.
Rearranging Flexible Furniture	Faculty may expect custodial staff to rearrange the flexible furniture back into a standardized position prior to each class. Establish norms with faculty that students should rearrange furniture either at the beginning or end of each class session.
Maintenance of Tech-Enabled Rooms	Adding additional technology hardware into the classroom increases required custodial staff's time to perform weekly maintenance checks for room functionality.
Floating Materials	These classrooms rely on materials not physically fixed to the classroom, such as dry erase markers for whiteboards. Install dry erase marker holders next to whiteboards and have custodial staff inventory and replace missing markers every few days.
Power Outlets	Students will cluster movable furnature around power outlets. Install a power grid underneath a raised floor to allow instructors to arrange student workstations in a variety of locations while still ensuring student access to outlets.



# Becoming (Purposely) Less Space Efficient

Active Learning Classrooms Require Increased Square Footage per Student



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# Adapting to New Classroom Space Requirements

Two Approaches Yield Different Square Footage per Credit Hour Needs

#### **Increase Total Classroom Space**

Institutions maintain same number of course contact hours, accept additional space requirement to maximize learning outcomes

September						
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		m				

#### **Remain Space Neutral**

Institutions reduce class meeting times to conserve space; instead, student complete additional group work outside of class

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# Active Learning Space Needs Beyond the Classroom

## Study, Collaborative, and Pull-up Spaces Supplement Classroom Space

#### **More Space Needed Outside of Class**



# Additional Projects Outside of Class

Students need additional space to work on group projects outside of class



# Social Media Increases In-Person Connections

Students can connect with other students with similar academic interests, similar study needs



# Tech Enables Learning to Happen Anywhere

Ubiquity of personal devices and electronic course materials allow students to meet, study beyond typical locations like library

#### Repurpose Dead Space to Reduce New Project Space Construction

#### **Repurpose Classrooms at Night**

- Rice University pilots opening up academic classrooms to students after-hours as designated study spaces
- Rice reports additional security patrols necessary throughout night, additional janitorial shift to clean rooms prior to morning classes

#### Convert Halls Into "Active Learning Corridors"

 Indiana University adds whiteboards, movable furniture throughout hallways with available space to provide students with informal pull-up spaces to continue discussions from classes

# Install Demountable Walls For "Clumping" Space Flexibility

- Webster University installs informal, movable furniture into areas designated for future offices
- Offices built with demountable walls to allow seamless removal if institution wants to revert space to student clumping areas

## Living It up on Campus

## Suite-Style Residence Halls with Luxury Amenities Increasingly Common



# Sampling of High-End Amenities in Student Housing

- Lazy rivers
- Steam rooms
- · Outdoor movie theaters
- Granite countertops
- · Leather sofas
- · Tanning beds
- Walking and fitness trails
- Ice skating rinks
- · Poolside cabanas
- Putting greens
- · In-suite housekeeping





## Luxury Residence Halls Boost Enrollment, Combat Competition

If You Build it, They Will Come...



# College as a Country Club: Do Colleges Cater to Students' Preferences for Consumption?

"Most students do appear to value college consumption amenities, including spending on student activities, sports, and dormitories.

While this taste for amenities is broadbased, the taste for academic quality is confined to high-achieving students....colleges face very different incentives depending on their current student body and the students who the institution hopes to attract." ...If You Don't, Someone Else Will

376K

New off-campus student housing units constructed, 2005-2014<sup>1</sup> 300%

Increase supply of off-campus housing units, 2010-2014<sup>1</sup>

\$4-5B

Estimated size of student housing market

#### **Off-Campus Providers Cater to Student Whims**

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"[On campus] you never got your privacy. Now, I can take a five-hour shower and not worry about it."

Student Public Research University

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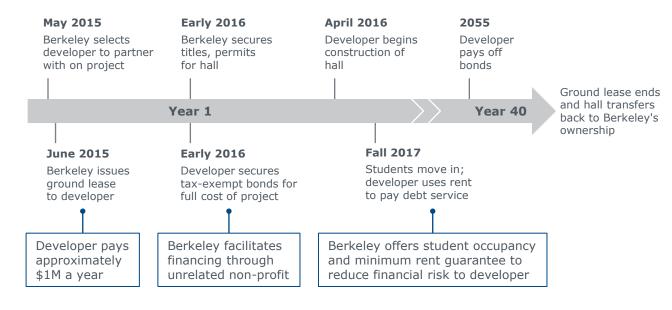
"We don't need four TVs in one room, but we'll take it."

Student Regional Private University

Excludes on-campus and alternative, non-purpose built housing



## Tentative Timeline of PPP Lease for New 500-Bed Residence Hall at UC Berkeley



## Community-Centric Res Halls Offer Different Value

Bowling Green State University Designs Halls to Promote Underclassmen Recruitment and Retention

#### BGSU's 2010 Master Plan Addresses 1st and 2nd Year Residence Life Enhancements



BGSU updates residential portfolio by building two new residence halls, significantly renovating a third, and undertaking selective improvements to others

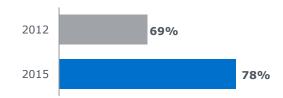


New and updated halls emphasize community spaces: lounges, study spaces, kitchenettes, social lobbies; 30% of new residence halls comprised of common space



Updated halls operating at capacity to increase recruitment and retention, experiencing high student demand

# **BGSU First-Time, Full-Time,** Fall-to-Fall Retention Rate



#### On-Campus Living Positively Linked to Future Alumni Engagement



- Students' on-campus living experience directly and positively affects their alumni giving participation rates
- Interactive communities linked to higher alumni donation participation than halls without intentional social spaces and programming

## The Professor Next Door



## Elon's Global Neighborhood Formally Integrates Academic, Social Experiences



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"The Global Neighborhood is unique in that it truly integrates academic and living components into one learning component. We recognize that the best academic institutions have remarkable residential programs designed to promote faculty interaction."

Dr. Steven House Provost, Elon University

# **Key Design and Programming Components** of Elon's Global Neighborhood

#### **Merged Academic and Residential Life**

- Classrooms in residence halls, with underclass students enrolled in some courses with other hall residents
- A mix of small and large study spaces in residence halls and neighborhood academic center promote academic collaboration, discussion
- Faculty offices for the Core Curriculum located in close proximity to residence halls; one faculty member lives in each hall

#### **Intentional, Inclusive Community-Building**

- Café and attractive social spaces encourage student interaction outside of classroom and personal residence hall rooms
- Faculty-in-residence hosts students in apartment for refreshments, conversation on weekly basis
- House and neighborhood traditions build community and animate the intellectual and social life of the neighborhood

#### Progress Students Through Hall Types Based on Class Year to Realize Greatest Benefits

	Luxury Residence Hall	Community-Centric Residence Hall
Prospective Students	Tour prospective students through high-end, suite-style halls to encourage enrollment	
Underclass Students		House first-year students in community-centric halls to promote retention and future alumni engagement
Upper-Level Students	Open luxury halls up to upper- level students to incent them to stay on campus	

Approximately 15% of institutions have moved to this "ladder of progression" model to maximize the impact of their residential portfolios



# Pushing the Boundaries of Residential Design

## University of Utah's New Residence Hall Maximizes Student Interaction

#### **Architectural Renderings of Lassonde Studios**



A LIVE SELECTION OF THE PROPERTY OF THE PROPER

Facility houses students from across years and majors, encouraging cross-disciplinary collaboration

Each of four planned residential floors will have a different theme (e.g., Games & Digital Media and Global Impact & Sustainability) with matching design, tools, and equipment

20% of facility's 400 beds housed in 70 sq. ft. "living pods," which promote maximum student use of ample common space; pods are organized in communities of 20 students

Living pods incorporate dorm room essentials—full size bed, bookshelf, nightstand, closet, medicine cabinet, and mirror—into a 7'x10' space



# Tinkering in the Campus Garage

## Makerspaces Provide Multidisciplinary Learning Labs for Entire Campus

# Program-Specific Labs and Studios Distinct from Makerspaces



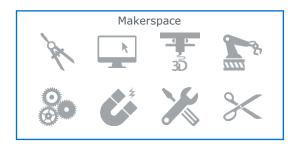






- · Program-specific equipment
- Access restricted to students in program
- Promotes defined curricular outcomes

#### Makerspace Combines Disparate Cross-Disciplinary Equipment in Open Access Lab



- Variety of tools, equipment
- Access open across campus, sometimes into outside community
- Can be used by classes but also groups or individuals, similar to gym or library
- Intended to spark creativity, innovation more than specific curricular outcomes

# Three Drivers Behind Emergence of Makerspaces



#### **Hands-On Learning**

Extend benefits of hands-on learning pedagogies beyond STEM classrooms to liberal arts students



# Interdisciplinary Collaboration

Facilitate organic crossdisciplinary collaboration to solve big challenges, stimulate creativity through exposure to new ideas



## **Career Preparation**

Provide students with hands-on work experience and job skills, help institutions "prove their worth" to affordability critics

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## The Intersection of Technology and the Liberal Arts

"Technology alone is not enough—it's technology married with liberal arts, married with the humanities, that yields us the results that make our hearts sing."

Steve Jobs

# Go Big or Go Home



## Makerspaces Must Meet High Bar to Be Functional and Worth the Investment



# **Essential Equipment Needed to Produce Dynamic, Effective Space**

- Laser cutter
- 3D printer
- Graphic design software
- Vinyl cutter
- Circuit board router
- · Sewing machine



# Additional Investments Recommended to Create, Maintain Optimal Facility

- Tables and open spaces where users can collaborate, design prototypes
- Support staff to maintain equipment, train users, and ensure safety



## **The Cost of Getting Started**

Pioneering institutions estimate initial financial investment of \$500K for equipment and \$1M for equipment and support



#### **Spaces That Lack These Essentials Yield:**



Impressive new amenity for campus tour



New students attracted to handson design and experimentation



Significant and intended utilization of the space



Interdisciplinary collaborations on potentially patentable technologies



Cross-disciplinary alumni and industry engagement

# Thinking Outside the [box]



## CWRU's Sears think[box] Makes Early Impact, Gains National Attention



# Sears think[box]: Case Western Reserve's Pioneering Makerspace

- Initial idea sparked by faculty push for senior capstone design space. Senior leadership, alumni, and industry bought into idea, expanded it beyond seniors to entire campus, community
- · 4.5k square foot temporary facility
- Open to entire campus, neighboring community
- Free access; users pay for materials they use
- Managed by 4 full-time staff, 25 TAs
- Similar to library or gym, most students use as shared resource for class assignments or personal projects, though space is available for full classes to use

### Results Achieved in Sears think[box]'s First 3 Years of Operation



110K

Visitors; 20% from outside community

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Patents procured

\$3M

Funding raised through venture capital, other campaigns across 12 patents



National coverage in *Chronicle*, *Crain's*, *Parade* 



White House recognition



# Lessons from the Makerspace Frontier

Element	Description of Advice
Invest in High-Quality, Heavily Utilized Equipment	<ul> <li>Higher quality pieces of equipment carry bigger price tags but greater ROI due to longer useful lives, lower maintenance costs.</li> <li>Laser cutters, 3D printers see high makerspace utilization; invest in a few, high-quality pieces of these equipment to maximize equipment investment.</li> </ul>
Position Facility to Improve Space Utilization, Ease Access	<ul> <li>Look to poorly utilized spaces to house campus makerspaces. Examples of campus makerspaces housed in storage facilities, old kitchens, and repurposed sections of libraries.</li> <li>Position spaces near periphery of campus to facilitate outside community access.</li> </ul>
Focus on Equipment Choice, Human Resources over Equipment Placement	<ul> <li>Adequate equipment and accessible staff ensure users find the equipment they need, regardless of placement or space layout.</li> </ul>
Enforce Protocols to Ensure User Safety	<ul> <li>Provide staff to train users and monitor machine activity.</li> <li>Develop system to restrict access to equipment to trained users. Case Western users wear badges that identify which equipment they are trained to use; most dangerous machinery requires key card access.</li> <li>Implement dress code to prevent clothes, hair, accessories from getting caught in machinery.</li> </ul>

# A New Campus Necessity?



## Unclear Whether Makerspaces a New Must-Have or Best Left to First-Movers

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#### Room for All...

"In a decade...a makerspace will become a standard amenity, just [like]...a cafeteria or gym. People won't ask 'Do you have a makerspace?' They'll say, 'Where is it?'"

Ian Charnas, Manager, think[box]

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## ...Or an Early Mover Oligopoly?

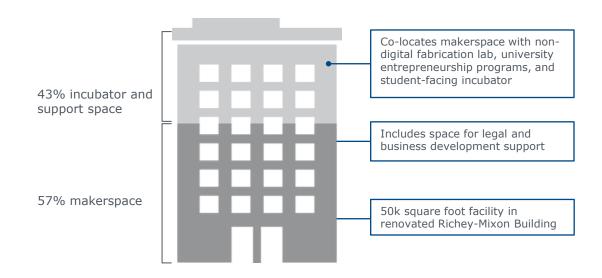
"Not everyone can be a leader. Only so many students will be interested in makerspaces, and those students will go to the first 100 movers."

Provost, Regional Public University





## Sears think[box] Extends Reach by Growing and Co-Locating Space





## **Evaluating Today's Session**



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Thank You!

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