



How to Set the Stage for Creative Collaboration

Scott Doorley & Scott Witthoft

With a Foreword by David Kelley



make space

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by Scott Doorley and Scott Witthoft.

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We don't know.**

make space



How to Set the Stage for Creative Collaboration

Scott Doorley & Scott Witthoft

with a foreword by David Kelley



Space matters. We read our
physical environment
like we read a human face.

Consciously or not, we feel and internalize what the space tells us about how to work. When you walk into most offices, the space tells you that it's meant for a group of people to work alone. Closed-off desks sprout off of lonely hallways, and in a few obligatory conference rooms a huge table ensures that people are safely separated from one another. Most work spaces were designed according to an industrial labor model, from a time when our work was tethered to big machines and our status was rooted in the size of our office space.

When I started IDEO with friends in 1978, I knew we had to work differently. We were engineers and still wore ties, but we sat in a circle on the floor for meetings. It made everyone feel equal and allowed us a certain kind of openness with each other. Since then, at IDEO and the d.school, space has been a foundation for the expression of our cultural values. We value innovation as a team sport; it needs "we" spaces more than conventional "I" spaces.

Collaboration and creation aren't bound to designated areas; they evolve throughout a space, absorbing different people, places, and perspectives.

Space and its impact on behavior have been important to me from those earliest days, through IDEO and my long association with Steelcase. At the d.school, it's been a critical element in creating a different kind of educational environment, one that nourishes creative confidence in our students. One of our first challenges was to equalize the respective status of students and faculty. When you walk into one of our classes, it's almost impossible to tell who's teaching and who's learning. Innovation thrives on this kind of equality. With a boss or a professor standing at the head of the room, it feels like a "sage on stage"—people are reluctant to share their ideas ("What if the boss doesn't like it?"). Reconfiguring the physical relationship is a powerful signal that participation is truly welcome. The result is that you get better ideas out in the open, where they can grow. But

there's not just one ideal design for a collaborative space. The people using it should be able to transform it themselves, move things around, and create what they need for the work they're doing at the moment.

Our students have responded to this in ways that have surpassed our biggest hopes. They come from very different backgrounds and very different places on campus and experience their deepest collaborations here. When our alumni—from school administrators to entrepreneurs—start their own organizations, they build their spaces around these same values.

Regardless of whether it's a classroom or the offices of a billion-dollar company, space is something to think of as an instrument for innovation and collaboration. It's not an initial, given condition, something that should be accepted as is. Space is a valuable tool that can help you create deep and meaningful collaborations in your work and life.

When we started the d.school, we were stuck with a double-wide trailer no one else wanted, the team leading our space design efforts had little prior expertise in the field, and we were told we would have to move every 12 months for years before our first official space would be available.

These apparently unfortunate initial conditions are not obvious when you walk into our newly renovated building at the heart of the Stanford campus. In hindsight, the path we were forced to take appears close to inspired.

The yearly moves turned out to be a profound forcing function for learning, not just about space, but for prototyping and evolving our entire organization. And having a team lead the way that seemingly had no business designing spaces set the stage for unexpected approaches to emerge. We weren't looking for a groovy office. We were looking to create learning experiences for our students, make it safe for them to fail, and provoke an ecosystem as complex as Stanford to change. The members of our team had experience that was perfectly suited to this challenge.

We have had the opportunity to be a bit more radical than others might feel is safe in their workplace. And we have been able to test our rapidly evolving ideas with real people every day—with the thousands of students who have

come to the d.school to learn how to be better innovators, and with their teachers and project partners, too.

At first, we used space to support the activities of our teams, as a signal that the d.school was a different kind of place, and as a way to embody our values. We put team spaces and couches in classrooms to facilitate project work and allow for moments of debriefing. We removed carpet to expose concrete floors to make it clear that the d.school is a work space, not an office space. And we put desks near the entrance so that people are the first thing you see when you walk in, reinforcing that one of our principal values is human-centeredness.

Along the way, we learned that we have to prototype our way into any new space; to continuously iterate, adapt, and evolve our spaces after we move in; and to think of space primarily as a way to change behavior, not as a facilities project or a showpiece for our brand. We want our teams to act in more empathetic ways, so we make our spaces more human, with more places to debrief, reflect, and connect. We want our teams to work collaboratively instead of individually, so we have generous collaboration spaces and “bare essential” individual spaces. We want our teams to get up and try stuff, not sit around and talk in long meetings, so we make seating uncomfortable and the tables too small. Supplies, tools, and workbenches are more apparently available than conference phones and

conference tables. We want leadership to move around to the person who has the relevant expertise at the time, not just to the person in charge, so we create huddle rooms without explicit status associated. There's no head of the table or front of the classroom.

We want our students and teams to be mindful of space and to take responsibility for setting up the environments that will amplify their work. So we set the expectation that each person is a steward of the space, that they need to care for it. At the same time, if it's not working, they change it or, better yet, hack it.

This book is an attempt to capture what the d.school adventure has taught us along the way and is a tool to help you to use space to develop your unique culture. I hope our story is an encouragement to you, suggesting that big things often have small beginnings, that radical change usually starts with brave but little steps, and that when people feel safe to try something new, spectacular things can happen. Good luck as you make space in your life, your teams, and your organization to innovate!

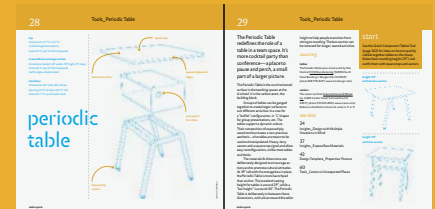
instructions

make space is a tool for using space to shape the culture and habits of a creative community. Building a space is tough, but shaping culture is an absurd act of daring. It's like assembling a 10,000 piece puzzle. On a grass field. During a hurricane. And the puzzle itself is a photo of a grass field. At 1:1 scale. Address this conundrum with action. Begin to deliberately alter your environment and you will reveal what enhances collaboration and what doesn't, what boosts creativity and what doesn't. Reconfiguring, prototyping, and building are the equivalent of starting a puzzle with the corners: a simple approach that illuminates a structure to attach more complex issues. The most difficult part of any of these actions is simply getting started, this book is filled with ways to start transforming your space. Many can be accomplished in hours, some in minutes.

make space has five different types of content: Tools, Situations, Design Template, Space Studies, and Insights. Individual entries from each are shuffled throughout the book and are described in more detail over there. We designed this book so that you would put it down—so that you can and will experiment.

Read it long enough to get inspired, then put it aside and get to work. Pick it up when you need another boost, then put it down again and get back to work.

Each entry and the sum of their collisions can help you quickly fine-tune every decision you make—from the shape & scale of the furniture you use to the music you play in the space—to inspire new ways of working and interacting.



tools

Make the useful things that fill up a space—furniture, storage options, materials, etc.

Tools range from DIY “hacks” that may take a matter of hours, to examples of CNC milled furniture you’ll likely need assistance in building. If you are a maker at heart or just can’t wait to try out some stuff, these will get you going. The rolling whiteboard Z-Rack (page 16) is a popular project that is not too difficult to construct. Each Tool spread features build instructions, tips, and sourcing information.

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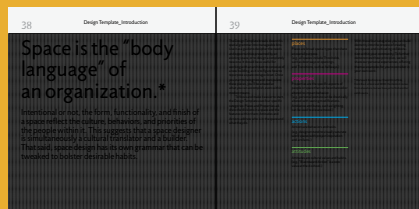
situations

Quick, repeatable configurations or patterns, usually at the scale of a room.

Some Situations take as little effort as simply rearranging existing furniture in a few minutes or even seconds; others require some consideration and construction. For example, “Around the Campfire” (page 32) is an easy pattern that has instant impact. The Situations featured here offer a starting point for shaping your space—create your own variations for best effect.

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design template

A comprehensive breakdown of the elements at play in a space, or the game behind the game.

This book is about space only inasmuch as it affects people. The design template deciphers how the sense of a place and the properties of the things within it spark creative and collaborative attitudes and actions. The template is based on the “Attitudes” in our particular culture (page 51) that may match or oppose those in yours. In any case it is still a great place to start the groundwork for intentionally playing with space.

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- 51 Attitudes



space studies

First-person dispatches from the front lines of space design.

Interspersed throughout **make space** are real-life case studies and candid essays from practicing designers, teachers, artists, entrepreneurs, managers, and researchers who have put a number of these concepts to good use. Read these to understand how people are tackling issues similar to those you face. They offer a wealth of insights within their narratives. Check out how ITP, New York University’s cutting-edge digital media program, encourages students to evolve the space to suit their needs with giant “erector sets” (page 226).

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insights

Kernels of understanding we've discovered through our "trials and errors."

Some are hunches that seem to hold true, others are well-known tenets that we've successfully put to use. There is no substitute for doing it yourself, but we hope you'll be able to take advantage of these Insights with a little less of the heavy lifting we endured in discovering them. We've found playing with the principles in the "Design for Primates" Insight (page 23) to be very fruitful.

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- 65 Separate Needs from Solutions
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Making Space for Change

by Scott Doorley and Scott Witthoft



Space Studies_Making Space for Change

The d.school is everywhere at Stanford. Our students come from all disciplines and take what they've learned back to their respective departments and the map of our past locations on campus is almost as far-reaching as our current impact. Since the founding of our first physical teaching space, the entire d.school has moved four times in as many years. That's a lot of moving, even for a dynamic organization focused on building adaptable innovators.

With each move, we were forced to occupy and modify spaces we would not have instinctively chosen. In responding to the scale and character of each building, we've recognized that a tool for designing creative spaces is to create smart parameters that themselves stimulate mindful modification. So began our love of improvisation.

Birch Modular: Be Not Precious

Double-wide trailer on the outskirts of campus

Birch—a twenty-year-old “temporary” trailer—was such a mess that the d.school's executive director, George Kembel, feared we'd have to return our funding if our principal donor saw the place. But Birch's obscure location and shabby condition signaled permission to experiment. And that's exactly what we did. Carpets were torn out, walls were repeatedly demolished and rebuilt, and we drilled into everything—including the floors—with abandon. Birch is where we found our tone: experiment wildly and consider nothing precious.

top: Birch Modular
during demolition &
construction.

bottom: Birch in
action with spaces
for staff & students.



**Sweet Hall, 2nd Floor:
Change Everything**

On-campus office building

Sweet Hall was filled with offices, so we tore everything out of the entire second floor. With nothing left but the concrete floor, we turned the whole space into a roller rink of sorts by putting everything on wheels. With couches, tables, and walls completely mobile, we reconfigured everything at least every few weeks, sometimes daily. These rolling assets allowed us to do incredible things like prototype a full-scale design building for elementary school kids on a Thursday and run a group of Fortune 500 executives through a workshop that same weekend. The fun of this flexibility taught us limits, though, as even our closest collaborators felt disoriented when landmarks like the copy machine migrated overnight.

Building 524
before the flood,
but after the fluids
lab. The building
prior to d.school
modification.

**Building 524:
Experiment with Special Spaces**

100-year-old loft building
in the center of campus

Sweet Hall was a fluid work space. Building 524 was literally a fluid dynamics laboratory, filled with flumes and water tanks, and a very particular dank smell. We experimented at 524 with making distinct micro-environments by overhauling ten former PhD offices into collaboration concepts—ranging from plush lounges to an all-whiteboard room. In having these options, teams could tune their activities by choosing a particular space.

Sweet Hall during
class. Teams sit
together in-
the-round before
switching into
an activity.



Building 550: Preserve the Spirit of the Move

Our second 100-year-old loft building
in central campus

The end of our itinerant arc, Building 550 was the original drafting studio for the campus. On sunny days, as the tall, lofted ceilings fill with natural light, this lovely environment once again serves as a perfect platform for what is next. But where to next? The product of all these moves has been the move cycle itself, forcing constant transitions among the different modes of Build, Reflect, and Refresh. We always knew we'd be moving, so we never invested too much, and an experimental attitude gave us permission to purge things that weren't working.

Currently, we're focusing on staying in motion while remaining in place. This includes actively preserving the posture of prototyping by keeping quarterly updates, maintaining spaces like the Concept Car (page 74) for front-and-center experimentation, and encouraging the ebb and flow of boundaries in the midst of our work, learning, and social spaces. We appreciate our current environment as an embodiment of our journey and as an agent for directions we may take in the future.

The d.school was founded in July 2003 by David Kelley and George Kembel along with a small group of Stanford faculty and Bay Area design practitioners with the financial support of Hasso Plattner. It moved into its first home in 2005 and now resides in Building 550 at Stanford University.

Scott Doorley is Creative Director and Co-Director of the Environments Collaborative at the Stanford University d.school. He was a d.school Fellow from 2006 to 2007.

Scott Witthoft is Co-Director of the Environments Collaborative at the Stanford University d.school. He was a d.school Fellow from 2008 to 2009.



top: Trusses above
the Bay Studio in
Building 550.

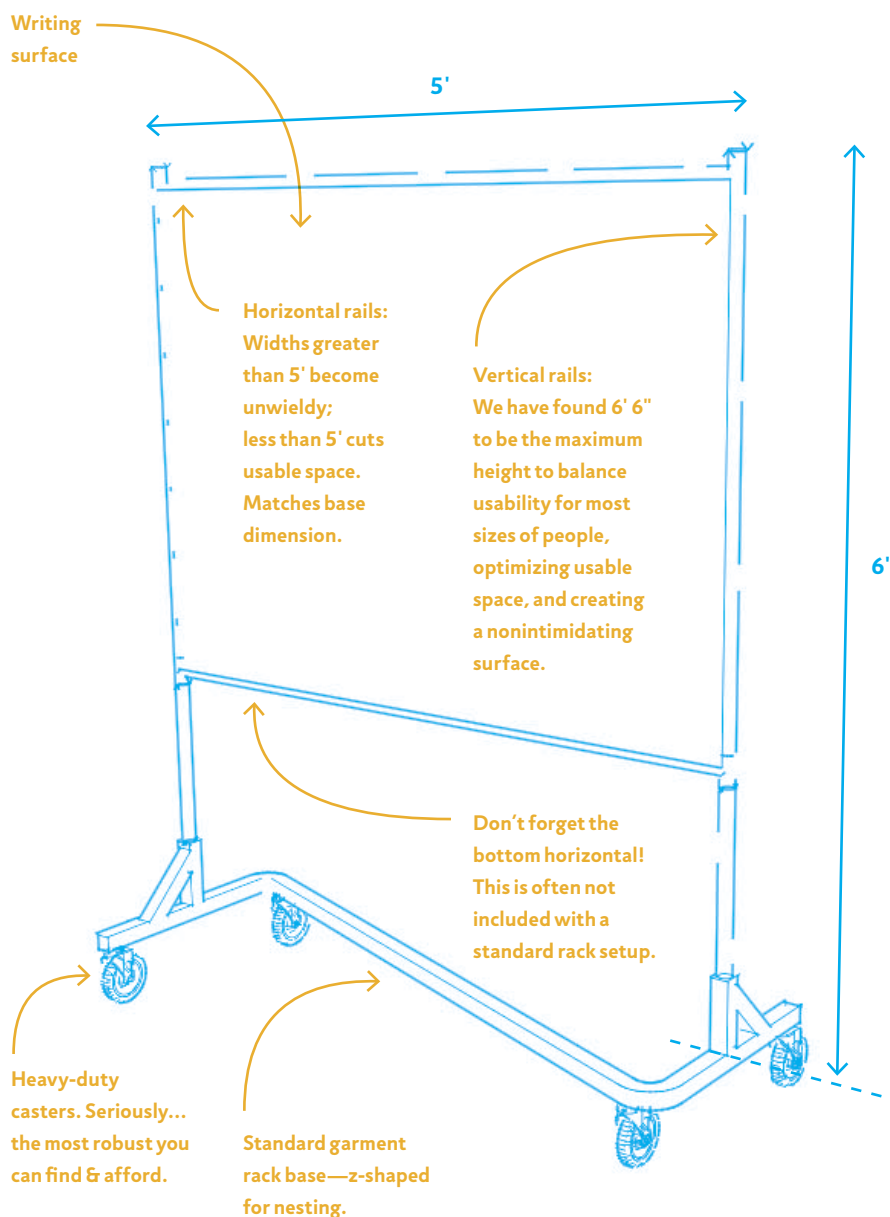
bottom: Class
in session within
a studio.

Easy-to-build dry-erase surfaces transform the working style of a space.

z-rack

One of the most enduring artifacts in the d.school, the Z-Rack, is actually a modified garment rack. When outfitted with a common construction material—showerboard—the Z-Rack becomes a deployable dry-erase surface.

This model is a fraction of the cost of a typical rolling dry-erase board, super-sturdy, easy to build, and large enough to act as a partition in the work space. The Z-Rack is great for subdividing large areas and creating differently scaled team work spaces.



build instructions

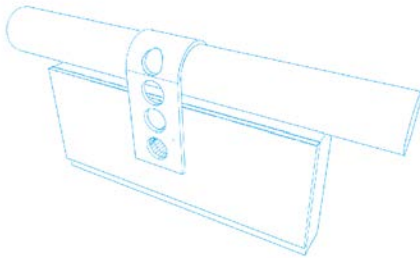
writing surface construction

Create a sandwich of showerboard panels laminated to a center panel of $\frac{1}{2}$ "-thick foamboard or $\frac{1}{4}$ " plywood. The result will be a dual-sided, rigid surface. It can be tricky to balance overall panel stiffness with weight—the center panel should be as stiff & light as possible.

writing surface attachment

Attach the writing surface to the Z-Rack frame using perforated galvanized steel strapping. Drill through-holes in the writing surface and attach at the two top & two bottom corners along the horizontal rails.

Metal strap attachment



showerboard or tileboard

The surface of this standard construction material works very well as an inexpensive and hackable alternative to commercially produced dry-erase surfaces. Eventually the surface will start to show residue and "ghosting"; water and a towel work surprisingly well for cleaning!

sourcing

garment ("Z") racks

The d.school has used the 6' tall double-rail Z-Racks with 4'- and 5'-long bases; locking casters are available at additional cost.
Sean James Enterprises, Inc. (425 Tribble Gap Road, Cumming, GA 30040; 888 866-9826; www.garmentrack.com)

showerboard

Showerboard is available at most home centers and local lumber suppliers.
Pine Cone Lumber (895 East Evelyn Avenue, Sunnyvale, CA 94086; 408 736-5491; www.pineconelumber.com)

foamboard

Arch Supplies (99 Missouri, San Francisco, CA 94107; 415 433-2724; www.archsupplies.com)
ULINE Shipping Supply Specialists (800 958-5463; www.uline.com)

casters

Industrial Caster & Wheel Co. (2200 Carden Street, San Leandro, CA 94577; 510 569-8303; www.icwco.com). Reference Stanford d.school red caster in 3" or 5".
California Caster and Hand Truck Company (1400 17th Street, San Francisco, CA 94107; 800 950-8750; www.californiacaster.com)

hardware

Perforated steel strapping and flexible steel "tape" are available at local hardware stores and home centers.
McMaster-Carr (600 North County Line Road, Elmhurst, IL 60126; 630 600-3600; www.mcmaster.com)

see also

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Tools_HACK: Showerboard Dry-Erase Surface

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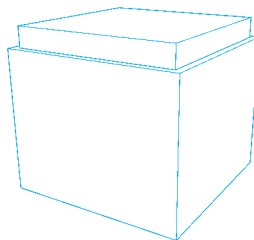
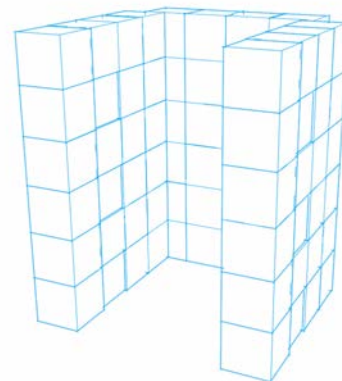
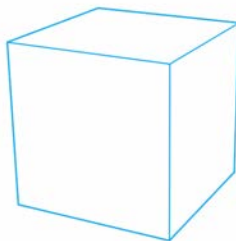
Tools_Whiteboard Sliders

190

Tools_Writable Surfaces Everywhere

foam cubes

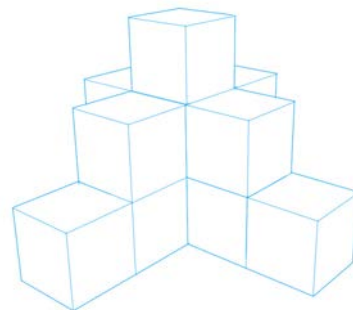
Standard cube
16"



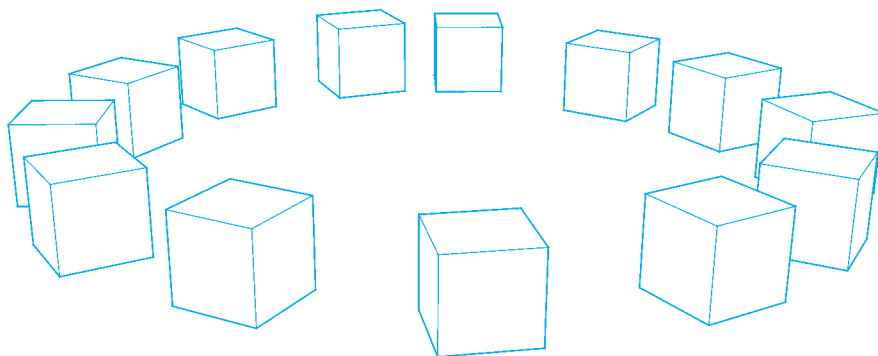
Sleeve
dimensions:
17" x 17" x 15"

Sleeved cube
dimensions:
15" x 15" x 17"

$\frac{3}{4}$ " plywood



Seating comfort:
25 minutes



Foam cubes are solid & light, and compact & stackable. They represent an abstract shape, easily adapted to imaginative uses. They can be used equally well for low seating during short conversations as for simulating elements of 3-D space at scale.*

What would it be like to make a wall here? Build it! We've seen the cubes configured into beds, a dark, enclosed room to simulate a "blind man's house," and a cube "castle," setting the stage for brainstorming on the topic of security.

The cubes are plain, which seems to be a key to their successful implementation. Their lack of ornamentation has been critically important to their use as abstract "building blocks." We've tried many different colors and shapes of cubes, and the best choice always seems to be gray.

Cubes are comfortable seats for about 25 minutes, so keep this in mind!

We've built another option, the Sleeved Cube, that adds a new dimension and makes a more comfortable seat. The plywood sleeve on this cube confines the foam and makes it comfortable for a longer period. Sleeved Cubes can also be flipped on their sides to create firm seating and different stacking surfaces.

The d.school uses approximately 150 cubes for a 50-student class; 20 cubes is a good starting quantity.

what to buy

We've looked at two criteria in sourcing foam—the density and the indentation force deflection (IFD). The gut-feeling translation of these criteria from someone picking up or sitting on a cube might be weight and stiffness. A good range for density is from 2.0 to 4.0; less than 2.0 might feel too light; greater than 4.0 might feel too heavy. A good range for IFD is 70 to 90; less than 70 is often too squishy or soft; greater than 90 is too stiff or rigid. The density of the cubes we have used most recently is 2.0 and their IFD is 70.

sourcing

Bob's Foam Factory (4055 Pestana Place, Fremont, CA 94538; 510 657-2420; www.bobsfoam.com)

Foamorder (1325 Howard Street, San Francisco, CA 94103; 415 503-1188; www.foamorder.com)

Foam 'n More (1925 West Maple Road, Troy, MI 48084; www.foamforyou.com)

*Special thanks to the IDEO Boston office for lending us our first set of cubes.

start

Have some milk crates or sturdy cardboard boxes lying around? Set up a prominent stack for general use and see what happens. Use some of them as informal seating for your next meeting. (Note: If you use boxes, they might need internal supports to function as sturdy seats.)

see also

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Situations_Around the Campfire

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Tools_Flip Stool

instant /shared studio

The Instant Studio is shared creative space that can be saturated with project work in seconds.

Inspiration: The open-air Maekong market outside of Bangkok sits atop an active train track. Vendor tents flank the route; fruits and vegetables lie inches from the track. A train pulls through, people step to the side, and awnings contract. Once the train passes, shopping resumes immediately. This happens about eight times each day.

Few organizations have enough space for every project team to have its own studio.

Creative spaces resemble the Maekong market. Like the trains, projects and activities emerge and consume available space. But when a project “stalls on the tracks,” the marketplace of other projects is left with inadequate space.

Studios work because . . .

You can spread out your work and get messy, you can immediately reengage work in progress after a pause, your tools are nearby, and evidence of your work is everywhere.

Studios are tough because . . .

They take up a lot of square footage that lies dormant when projects are inactive, and they can get cluttered, rendering them virtually useless.

The Instant Studio solves this conundrum.

It creates a space that, like the Maekong market, can be instantly engaged & expanded into an active studio. When you are finished, it can be just as quickly collapsed, leaving room for the next creative team.

Make it easy to get started.

You should be able to go from inkling to action nearly instantaneously—think in terms of seconds, not minutes. The longer it takes to get going, the more opportunities arise to slow things down.

Features of an instant studio:**Storage Gallery**

Use open shelving, prominently placed, to provide easy access and put work in progress on display. Use bulk sheet materials or dry-erase surfaces for display.

Whiteboard Sliders

Use these sliding walls to create instant dividers that can also be used to capture ideas.

Hanging options

Pegs or other hooks on the walls provide opportunities to put work on display quickly.

Clear defaults and resets

Make the expectations of “creative citizenship” clear. Require participants to go through an orientation to the space. Post clear visual instructions of how to reset the space. Don’t be afraid to remind folks of these reset rules.

start

Line team spaces like the Expandable Team Spaces (page 110) along the edge of an open space. Have project teams collapse their work back to these home bases when the teams are not active. Cut foamboard Short Boards (page 200) and drill out handles as portable work surfaces. Install hooks to hang up the boards in the shared space. Grab some simple open shelving units for shared storage as needed (available online through McMaster-Carr).

see also

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Tools_Whiteboard Sliders

110

Tools_Expandable Team Spaces

150

Tools_Bulk Sheet Materials

174

Situations_Storage Gallery

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Situations_Defaults

Context Is Content.

Space transmits culture. If there is one thing to be culled from these pages, look no further: this is it.

We're willing to pay a premium at restaurants not just for the food but also for the experience of being in the particular environment—specifically for the way the smells, the music, the lighting, the seating, the appointments make us feel. Take advantage of this insight and translate these immersive experiences to the workplace and the classroom.

Environments can be used not just to represent cultural values but also to inspire them.

David Byrne, former Talking Heads front man and ever-fascinating artist, explains it this way in his 2009 TED Talk, "Creation in Reverse":

"Context largely determines what kind of music is written. Maybe the analogy applies to other forms of creation as well—painting, sculpture, programming or performance. . . ."

"... The microphones that brought music to radios . . . changed the way we sang. . . ."

"Chet Baker sang in a whisper, as did João Gilberto. . . . These guys were whispering in your ear, getting right get-



ting right inside your head. Without microphones, this intimacy wouldn't have been heard at all. And mostly it wouldn't have been heard that well either, except in the privacy of a living room."

"It seems that creativity is adaptive, like anything else. When a space becomes available, work emerges to fill it."

An example:

This photo was taken on the first morning of a three-day Bootcamp in Design Thinking. We began on a train platform and asked the participants to challenge their assumptions by getting out and engaging people directly. (The project was about the morning commute.)

Passing trains made it nearly impossible to hear the short lecture we provided, but that was beside the point. The context said everything that needed to be said about getting out and engaging people.

see also

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Design Template_Places

43

Design Template_Properties

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Insights_Use Objects to Create Experiences

Design for Primates.

We're smart apes. Deal with it. Design ways to keep our bodies moving.

Humans are slightly evolved apes with big brains (and less hair, in most cases). The last 100 years of technological innovation in the workplace have focused on the big brain part. Books, computers, desks, offices are all focused on helping us get the most out of our brains. Okay.

But let's look at apes and their bodies for a second.

Visit any zoo and you'll see that apes spend time sitting—lots of it. But they also climb, crawl, swing, lie down, and wrestle. They even negotiate status in space through posture, position, and movement.

Back to humans. Remove the desk from the equation, give people permission to assume alternative postures, and watch what happens.

Our students are good examples: they lie on the floor, perch on the backs of couches, bounce on their toes, pace around the room, and do chin-ups on exposed beams—all during “work” sessions.

Find ways to get the body moving, such as open space, nonprescriptive seating, and multiple seating heights. Movement is not only healthy but it introduces opportunities for communication through body language.

As an example, when working with teams, we limit the amount of space a team has around a table so everyone must negotiate that space as a limited resource. A team of four gets a table that can be occupied fully by only two or three at a time. A bias toward tall horizontal surfaces (tables and stools) lowers the amount of energy required

to move from a seated to a standing position. Once standing, it is easier to shift leadership roles and negotiate status on the fly.

see also

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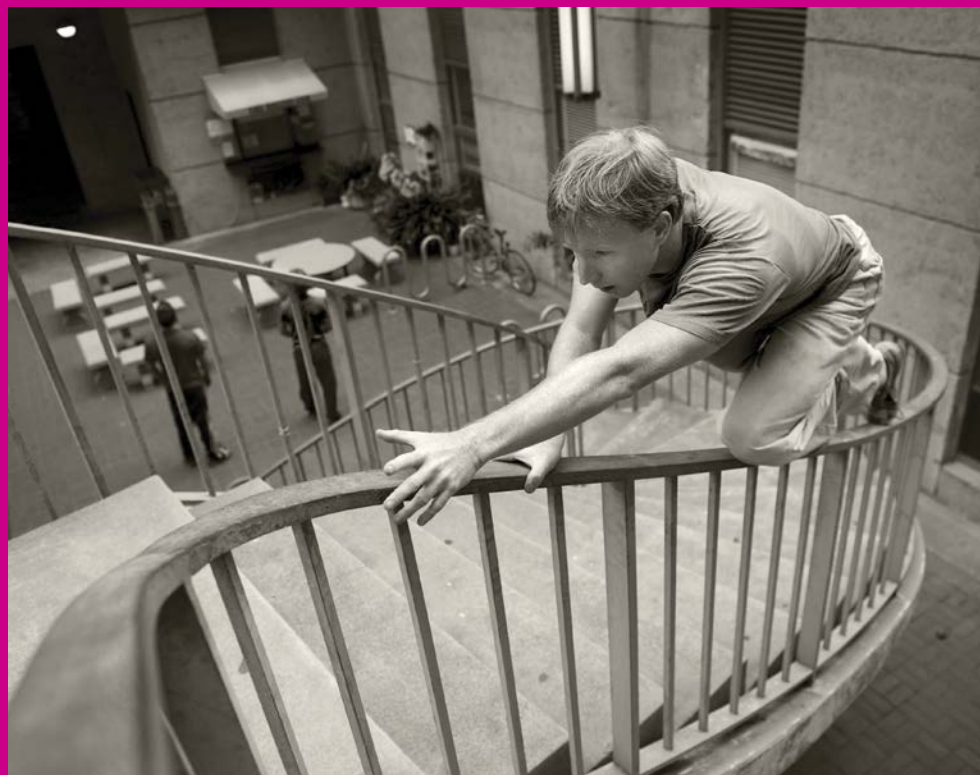
Tools_Foam Cubes

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Tools_Periodic Table

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Design Template_Properties: Posture





Design with Multiple Situations in Mind.

Almost all spaces are used in multiple ways. More often than not, the unintended use case is both more frequent and more interesting.

A dining room doubles as a home office; a living room for adults is a playroom for kids; a kitchen becomes the primary gathering spot during a party. Design with alternate uses in mind. While you'll often find that there is more than one use for a room, it may not need to be completely and uniquely redesigned for each purpose. A room may have several general uses, but you can often group them by the kind of activities they support.

A fun and eye-opening exercise leading to action is to reexamine a room. This is often more easily accomplished outside of your own space, but it is worth looking at locally.

What other functions, outside of its intended use, is the room in question really being used for? Assuming you want that activity to continue, how might you quickly alter the space to support that activity?

see also

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Insights_Follow the Hacks:
Innovation Is Everywhere

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Design Template_Places

A Little Prep Goes a Long Way.

Give yourself time to prepare a space before you begin.

Easy to say, hard to do. Schedules are often filled with back-to-back activities. But taking a moment—say, 10 or 15 minutes—to adjust a space before

starting an activity can change the experience for everyone. It prompts behavior in response to a curated event rather than a haphazard gathering.

Two simple things that can be adjusted in almost any space are orientation & ambience.

Orientation: How are people positioned to engage objects or each other? Do you want the group to have shared focus on an object (say a presentation) or do you want them to be able to

engage each other? If the latter, arrange chairs in a horseshoe or circle.

Ambience: What is the vibe or mood you are trying to create, and what is the duration of the gathering? Lowering the intensity or limiting the number of lights in a space can shift a mood from active to reflective. Opening windows (when possible) can provide some energizing fresh air for a long meeting and a little background noise that raises the energy level and increases the awareness of the surroundings.

see also

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Situations_Around the Campfire

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Design Template_Properties:
Orientation

45

Design Template_Properties: Ambience

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Situations_Defaults

d.school teacher
Michael Dearing
prepares a “café
style” environment
for student teams
in one of the
d.school studios.



hack

Showerboard is the cheapest and easiest material for creating a writable wall surface.

showerboard dry-erase surface

Transform
vertical surfaces.