Learning from Learning Spaces
Informing Collaboration Space Design Through a Multi-Site Post-Occupancy Evaluation & Workshops

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Learning Objectives:

• Understand the *multi-step process* of a cross-project post-occupancy evaluation (POE) and how to collect meaningful data to inform future project designs.

• Illustrate specific *spatial design features* that encourage collaborative learning.

• Apply POE *lessons learned* from five K-12 collaborative learning spaces to align to educational vision and goals specific to your projects.

• Describe *components of a Toolkit for Collaborative Spaces* to spark co-design conversations that lead to well-designed collaborative spaces that become well-utilized spaces.
Collaboration Matters
Space Matters
Co-Design Matters
Stakeholders Matter
why collaborate?

Q+A
study methodology
six phases

1. Literature Review:
   Collaboration in K12 Learning

2. Education Space Designers' Perspective:
   Survey + Focus Group

3. Education School Leaders' Perspective:
   Surveys + Workshop

4. Stakeholders' Spatial Experience:
   Field Observations

5. Data Coding and Analysis:
   Findings

6. Toolkit for Collaborative Spaces:
   Conversations for Co-Design
research partnership

The Big Question:
In what ways do designed environments help or hinder the process of collaborative work + learning?

Goals:
- Empower use of environments designed for collaboration – helping well-designed spaces become well-utilized spaces
- Co-create opportunity for action-oriented research on use of designed environments as catalyst for change and innovation

Research Partners:
- 2 Public Elementary Schools (CA & TX)
- 1 Public High School (CA)
- 2 Charter High Schools (CA)

Preliminary Findings:
- Still rolling in –
  - surveys from one elementary
  - observations of one elementary & one middle school (engaged recently)
Design Intent

This public high school was reconstructed to provide a 21st Century learning facility for “a professional, collaborative, community of learners.” One aim is for students to “productively interact within collaborative environments for learning and problem solving.”

“The design of the new campus is one of collaboration and transparency. Teachers have collaborative office spaces, and students have ten interior collaborative spaces, including the Student Union.”

- School Accountability Report Card, 2018-19
Design Features Intended to Support Collaborative Learning

- Common areas adjacent to classrooms
- Flexible furniture
- Glass walls
- Hallways, wide, with touchdown spots and writeable walls
- Large gathering spaces
- Media screens
- Nooks
- Sliding glass doors
- Student display areas
- Whiteboard surfaces
data collection

**surveys**

20-minute online survey

**User Feedback**
- Engagement
- Nature of collaborative work
- Features supporting collaboration
- Ratings of spaces
- Recommendations for future school design

**observations**

3-6 one-hour observations

**Space Usage + Changes**
- User behaviors in the spaces
- Condition of the spaces
- Layout review
- Floorplan notes re use/mods
- Photos

**workshops**

1-2 one-hour “journey of collaboration”

**Focus Group + Professional Development**
- A collaborative activity
- Empower practice
- Any space or use modifications
- Strategies to support collaboration
- Lessons learned from the study
What we assessed with the surveys...
online survey

SECTION 1: Designing Future Schools for Collaboration

- Acoustics
- Air Quality / Ventilation
- Belonging / Ownership
- Furniture + Storage
- Layout + Adjacencies

SECTION 2: Your “Open Area” Collaboration Spaces

- Promotes ease of interaction
- Supports teaching + learning activities
- Supports sharing of knowledge and ideas

- Provides a variety of spaces + resources
- Comments

SECTION 3: Your “Enclosed Area” Collaboration Spaces

- Same questions as “Open Area” spaces

SECTION 4: How the Overall Design Supports a Culture of Collaboration

- Schoolwide proximity/adjacency, privacy and permission to promote beneficial interactions
- Adaptability of classroom for different activities
- Collaboration zones and frequency of grouping/re-grouping students for collaboration
- Areas of school most used for interactive group work and why
- Share instance in which a specific feature of the physical environment made it easier to teach and engage students in collaborative work/learning

SECTION 5: About You

- Demographics
What we focused on for the observations...
field observation sessions

**Collaboration Study Observation Checklist – learning environments**

<table>
<thead>
<tr>
<th>School:</th>
<th>Date:</th>
<th>Start time:</th>
<th>End time:</th>
</tr>
</thead>
</table>

**Area:** (check one)
- Convertible space (openable/bi-folding walls between classrooms or other spaces)
- Corridor space
- Outdoor space
- Quiet space
- Shared collaborative space between classrooms
- Social space (lunch room, student union, MPR, or library)
- Teamed collaborative space

<table>
<thead>
<tr>
<th>Observations</th>
<th>Count</th>
<th>Notes (posture, layout, signage, décor, accessibility, passive/active, etc.)</th>
</tr>
</thead>
</table>

**Thoroughfare Use:** Entering/Exiting
- Student (Male)
- Student (Female)
- Teacher/Admin/Staff (Male)
- Teacher/Admin/Staff (Female)

**Group Activity:**
- Student (Male)
- Student (Female)
- Teacher/Admin/Staff (Male)
- Teacher/Admin/Staff (Female)
- How long in space: activity duration?
- Resources used?
- Collaborating? Group size?

**Individual Activity:**
- Student (Male)
- Student (Female)
- Teacher/Admin/Staff (Male)
- Teacher/Admin/Staff (Female)
- How long in space: activity duration?
- Resources used?

**Physical/Design Features:**
- Adjacency, lighting, acoustics, temp, air quality, flexibility, furniture types
- Accessible Resources: whiteboard, monitor, touchscreen, pin-up, etc.
- Affordances: obvious cues to help users know how to use the space?
- Visible school brand/pride?

**Qualitative/Subjective/Experiential:**
- Is the space conducive to or hindering collaboration? How?
- Is the space being used as designed or has it been modified by users?
- How has it been modified? How do mods seem to support collaboration?
What the workshops entailed...
workshops

What's Up with Collaboration?

Learning / working towards a shared goal
- Inter-active collective
- Intra-activity individual

Why Collaborate?
- deepens understanding
- develops human skills
- critical thinking and reasoning
- creativity
- communication
- social outcomes
- social aspects enhance engagement
- aids in academic outcomes

Collaborative Learning Spaces

Space Matters! and it's more...
Research highlights the importance of the alignment of educational approach and space.
A better fit supports better learning outcomes.

It's about Activity-Environment Fit

How do your physical spaces "speak" the language of collaboration?

Three ways in which the physical space is supporting the spectrum of collaboration.

1. Love the glass walls
   moveable furniture
   writable desks fabulous

2. No supervision in the common spaces

3. More student
   teacher agency

nothing new

Tables set up for collaboration with each other rather than "listening to the teacher"
E.g. let scholars do work together in an assignment.
In with directions we share ideas that are an effective strategy.
(With thanks from Pagayas, Mentsi)
Working as Pedro

student-student | student-teacher | teacher-teacher | across departments
Data analysis...
analysis of the workshop and survey comments

- Collaborative spaces support a range of learning activities and outcomes.
- Collaborative spaces support a range of human needs and development.

THE BIG WHY

The Space to Collaborate

THE DESIGN HOW

- The space purposefully cues the permissions necessary for collaboration. Embedded in a culture of collaboration and trust, users understand how to effectively collaborate and are able to make decisions in how they best utilize the space.

THE DESIGN WHAT

- The space is well-defined and cues behaviors necessary for collaboration. Users can readily see the explicit purpose of the space.
- The space is accessible for informal use via its adjacency to core learning spaces or the ease of formal scheduling if non-adjacent. Users can readily access the space with appropriate levels of supervision.
- The space attends to individual humans needs. Users experience appropriate levels of personalization and distraction is minimized.
- The space supports a broad spectrum of activities and is flexible in its arrangement. Users can appropriately modify the space based on the task at hand.
- The space has the necessary resources, configurations, and building features to support a range of activities and needs. Users have what they need to successfully collaborate.

- Pink = concentration of codes
- MAXQDA - The Art of Data Analysis
- MindGenius
analysis of scaled survey items

% who rated **VERY IMPORTANT** or **IMPORTANT** (n=53)

High and low examples of what educators recommend for future schools to best support the spectrum of collaboration...

<table>
<thead>
<tr>
<th>Category</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tech infrastructure</td>
<td>89%</td>
</tr>
<tr>
<td>Natural daylight</td>
<td>87%</td>
</tr>
<tr>
<td>Areas for quiet focus</td>
<td>78%</td>
</tr>
<tr>
<td>Ease of layout change</td>
<td>48%</td>
</tr>
<tr>
<td>Close proximity</td>
<td>46%</td>
</tr>
<tr>
<td>Transparency/visibility</td>
<td>33%</td>
</tr>
</tbody>
</table>
observation of elementary learning commons

COLLABORATION SPACE MAPPING
1. students working together between class
2. student working privately behind bookshelf
3. one on one teacher-student instruction
4. hi-top table used by students each session
5. higher surfaces used for teacher-student collaboration
6. students utilizing white board space for group learning
7. student reading quietly on tablet
8. students checking out tablets for group work
9. group of students working together on the floor

interaction hotspots
<table>
<thead>
<tr>
<th>Broad Application</th>
<th>Apparent (explicit signaling of collaborative purpose; clear expectations of use)</th>
<th>Available (accessible, adjacent, visibility &amp; line of sight for adult supervision)</th>
<th>Attentive (accounts for individual needs; attends to fundamental human &amp; health needs; addresses visual, acoustic &amp; kinetic distractions)</th>
<th>Agile (Flexibility – Time, Space, Use, Movement, &amp; Tandem adjacent activities)</th>
<th>Afforded (Variety + Size of Space; Building Features + Equipment, e.g., glass, sound proofing; moveable partitions)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Public ES</strong></td>
<td>Variety of tables and furniture to accommodate collaboration, but no signage or very explicit signaling/cues for behaviors</td>
<td>Learning Commons in two primary grade buildings are central and adjacent to six classrooms; glass walls provide literal and visual connection and line of sight from all; ample space for, and observations of, multiple teachers using commons at the same time</td>
<td>Comfortable, easily moveable furniture; attends to needs for social engagement, enjoyment and fun, physical movement, self-expression; opportunity to escape acoustic, visual, &amp; kinetic distractions</td>
<td>Agility of all five types - observed students moving furniture as needed; tandem activities in class &amp; commons</td>
<td>Glass walls/slider doors between classrooms and commons; digital devices; variety of furniture, ample room to move about; visibility; views; some high-tech and low-tech resources for student &amp; teacher use</td>
</tr>
<tr>
<td><strong>Urban Charter HS</strong></td>
<td>Variety of tables and furniture to accommodate collaboration, but no signage or very explicit signaling/cues for behaviors</td>
<td>Learning Commons adjacent to some classrooms with some line of sight via glass walls; schoolwide collaboration spaces have minimal line of sight during class time but supervision during breaks and large group activities in the space</td>
<td>Comfortable, easily moveable furniture; attends to needs for relaxed interaction, sense of belonging, physical movement, self-expression, agency to choose where and how they work; opportunity to escape distractions, but upper floor location has no access to outdoors or fresh air</td>
<td>Agility of all five types - observed students moving furniture as needed; tandem activities in class &amp; commons</td>
<td>Glass walls/slider doors between classrooms and commons; variety of furniture; ample room to move about; visibility; views; some high-tech and low-tech resources for student &amp; teacher use</td>
</tr>
<tr>
<td><strong>Urban Charter HS</strong></td>
<td>Variety of tables and furniture to accommodate collaboration, but no signage or very explicit signaling/cues for behaviors</td>
<td>Learning Commons on two floors adjacent to five classrooms/labs and circulation spaces, but not clear line of sight for supervision</td>
<td>Comfortable, easily moveable furniture; attends to needs for relaxed interaction, sense of belonging, physical movement, self-expression, agency to choose where and how they work; opportunity to escape acoustic, visual, &amp; kinetic distractions</td>
<td>Agility of all five types, but teacher use of adjacent spaces for tandem activities was not observed</td>
<td>Well-afforded with variety of furniture; minimal high-tech and no low-tech resources</td>
</tr>
<tr>
<td><strong>Public HS</strong></td>
<td>Limited variety of tables and furniture; no signage or explicit signaling/cues for behaviors</td>
<td>Adjacent to seven surrounding classrooms to use, but varied line of sight from each – clear from three, partial from one, no visibility from three</td>
<td>Design intent for six student areas (collaboration &amp; transparency) was negatively impacted by post-occupancy wall installations closing off natural daylight, shades are often down between classrooms &amp; commons, comfortable furniture removed; dim artificial lighting, minimal room to move about</td>
<td>Tandem adjacent use by ASL teacher; potential for seven surrounding classrooms to use, but varied line of sight from each</td>
<td>Post-occupancy modifications reduced size of space and amount of furniture to support collaboration; no high-tech or low-tech resources available for student &amp; teacher use</td>
</tr>
</tbody>
</table>

Field observations across sites
**THE BIG QUESTION:** In what ways do designed environments help or hinder the process of collaborative work + learning?

**GOAL:** Empower use of environments designed for collaboration – helping well-designed spaces become well-utilized spaces.

**COLLABORATIVE SPACES**
- Support a range of learning activities and outcomes
- Support a range of human needs and development

**THE SPACE TO COLLABORATE**
- **WHY?**
- **HOW?**
- **WHAT?**

**AGENTIC**
- Apparent
- Available
- Attentive
- Agile
- Afforded
#1 Collaboration Benefits Both the Learning and Developmental Process

Collaboration fosters a spectrum of collective and individual learning activities as well as supports fundamental human needs.
Collaboration
It’s more than teamwork

Collaboration as a hub of intra- and inter-activity towards a shared goal

Individual focused
[independent pre-group work]

Group focused
[teamwork]

Individual diffuse
[reflective and "aha" moments]

Group diffuse
[interactive brainstorming]
Collaboration
It’s more than a 21st Century Skill

Social-Emotional Growth
Self-Expression
Engagement
Learning to Learn
Productivity
Essential Skills
Teaching Process
#2
Five Key Spatial Elements
Support Collaborative Activities

Collaborative Spaces are...
1. Apparent
2. Available
3. Attentive
4. Agile
5. Afforded
Apparent
Cue the purpose

• well-defined
• cues the behaviors and expectations necessary for collaboration
• users can readily see the explicit purpose of the space… “collaboration happens here”
• signage
• naming
• protocols

village | commons | neighborhood | collab | park | plaza | innovation south | pathways | meeting rooms
Available
Keep it adjacent and in sight

• Accessible for informal use via its adjacency or proximity to core learning spaces
• Ease of formal scheduling if non-adjacent.
• Users can readily access the space with appropriate levels of supervision.
• **Attention to line of sight** for adult supervision
• Available in terms of hours of use
Attentive
Attend to the needs of the young human (and their adults)

- Individual needs of the user including comfort, personalization, privacy, quiet
- Healthy environment including access to the outdoors, lighting, natural light, physical safety, room to move, ventilation and fresh air, views
- Level of control over air quality, ventilation, lighting, sound amplification
- Addresses issue of acoustic, visual, and kinetic distraction

sight | hearing | touch | taste | smell | balance | body position | movement | hot or cold | pain | overall health | time
Agile
It’s more than flexible furniture

TIME FLEXIBILITY
Primary purpose of the space can shift over time

SPACE FLEXIBILITY
Easily rearrange or reconfigure the space based on the learning need at hand

USE FLEXIBILITY
Conduct a variety of activities within the space as configured

MOVEMENT FLEXIBILITY
Freedom of movement in and around the space

TANDEM FLEXIBILITY
Simultaneous use of adjacent or other spaces
Afforded – Variety + Size
It’s more than a classroom zone

Variety of Space
- Combinable space via moveable partition
- Core classroom zones
- Enclosed meeting rooms
- Hallways and stairways
- Informal nooks
- Makerspaces
- Open interior spaces
- Outdoor space
- Project or team rooms
- Quiet or personal space
- Social gathering spots
- Teacher enclosed areas
- Think tanks

Size of Space
- Ample room to move about
- Room to easily group and regroup furniture
- Spaces to accommodate medium-sized groups (12-15)
Afforded – Building Features + Equipment
Outfitted for collaboration

Building Features
• Glass walls and doors
• Higher ceilings
• Moveable partitions
• Roll-up doors
• Shades or blinds
• Sound proofing
• Storage
• Student display areas
• Visibility between interior spaces
• Windows and views

Equipment
• Charging stations
• Digital devices
• Power outlets
• Supplies
• Shared display
• Tables for students
• Variety of furniture (in type, height, moveability)
• Wi-Fi
• Writeable surfaces
Afforded – Those Interior Windows + Glass
The “Learning View” as a 6th spatial view pattern

Benefits of the “Learning View”
- Daylighting
- Line of sight for adjacent use of space
- Culture of collaboration
- Learning on display
- Improved security
- Sense of openness and transparency

Challenges of Attention Distraction
- Student’s off-task activities
- Unmonitored activities
- Incompatible activities
- Kinetic distraction
- Unclear expectations of the shared use of space

Q+A

Or is it about cultural readiness to use nearby spaces?
Tanner (2008) exterior spatial view patterns support student outcomes:
views overlooking life | green areas | unrestricted views | functional views | living views
#3
Well-Utilized Collaborative Spaces Involve a Cultural Readiness and Agency

- Collaborative spaces are *agentic* spaces...
  - They are embedded in a culture of collaboration and trust.
  - Users can make decisions about how best to utilize the space.

leadership  |  training  |  trust

*Autonomy, choice, and purpose is innate to humans and, when fostered, leads to increased motivation and engagement.*
Design Intent

This public high school was reconstructed to provide a 21st Century learning facility for “a professional, collaborative, community of learners.” One aim is for students to “productively interact within collaborative environments for learning and problem solving.”

“The design of the new campus is one of collaboration and transparency. Teachers have collaborative office spaces, and students have ten interior collaborative spaces, including the Student Union.”

- School Accountability Report Card, 2018-19
removed comfortable corridor seating

Post-occupancy modifications negatively impacted:
  • Attentive and afforded features of the space
removed soft, moveable seating

Post-occupancy modifications negatively impacted:
  • Attentive, afforded, agentic and agile features of the space
modified culture and policies, which removed permissions

Post-occupancy modifications negatively impacted:
  • *Agentic* features of the space (to be able to use it without supervision or requesting permission)
added dividing walls

Post-occupancy modifications negatively impacted:

- **Apparent** features
  - Moveable furniture that cues gathering
- **Availability** features
  - Transparency and line of sight for adult supervision
- **Attentive** features
  - Comfortable furniture
  - Natural light + views
- **Agile** features
  - Tandem flexibility to use adjacent spaces at the same time for the same/related activity
  - Moveable furniture
- **Afforded** features
  - Size of space with ample room to group and regroup participants and furniture
- **Agentic & Cultural Readiness** features
  - Trust in students to use the space responsibly
Toolkit for Collaborative Spaces
Ten Conversations for K-12 Co-Design

Goal
Well-designed and well-utilized collaborative spaces

Based in Study Findings
Understanding in purpose
Five key spatial themes
Leadership in culture
Competency in practice
Trust in user

If you were in the middle of the room the whole time, why can we not find a single witness to corroborate your testimony?
Major Findings

Key Points for Co-Design Conversations

Toolkit Resources
- To use with client
- To provide client
- To enhance designer understanding and options
Key Takeaways

It’s more than teamwork
Probe for ways for spaces to support social and emotional well-being and offer individual respite from the more focused cognitive processes.

It’s more than flexible furniture
Design for flexibility across time, space, use, and movement. Consider the tandem use of adjacent spaces. Size of space can be a factor.

Cue the purpose
Consider how the space can “speak” the language of collaboration through signage, furniture, and resources – today and tomorrow.

Variety is important
Collaboration is supported through spatial variety, especially adjacent small group spaces, quieter spaces, and spaces for teacher privacy. Collaboration is an anytime, anywhere activity.

Keep it adjacent & in sight
Without ample line of sight, space is at risk of under-utilization. Ease of use is needed.

Ensure the resources
Digital technologies, writeable surfaces, moveable tables rather than desks, and enough power outlets leverage the design.

Protect attention
Address issues of somatic distraction especially sound and proximity (p.s. windows are not a great distraction).

Conversations promote agency
Co-design discussions are an opportunity to foster a culture of readiness for the use of space. Hampered permission can undermine the design intention for the space.
Questions?
LPA

Changing Lives by Design™