“(~~No~~) Go Writing on the Wall”: Creative Thinking Modes and Collaboration

2022 Teaching & Learning Symposium, Illinois State University, Elke Altenburger

Studio Culture: Ideal

Design studios are commonly conceptualized as uniquely collaborative learning environments.

- Long contact hours: students design, instructors give feedback
- Student-teacher relationship = creative apprenticeship
- Students working together at all hours learn as much from their peers as from their teacher.

Studio Culture: Ideal

Studio Culture: Ideal

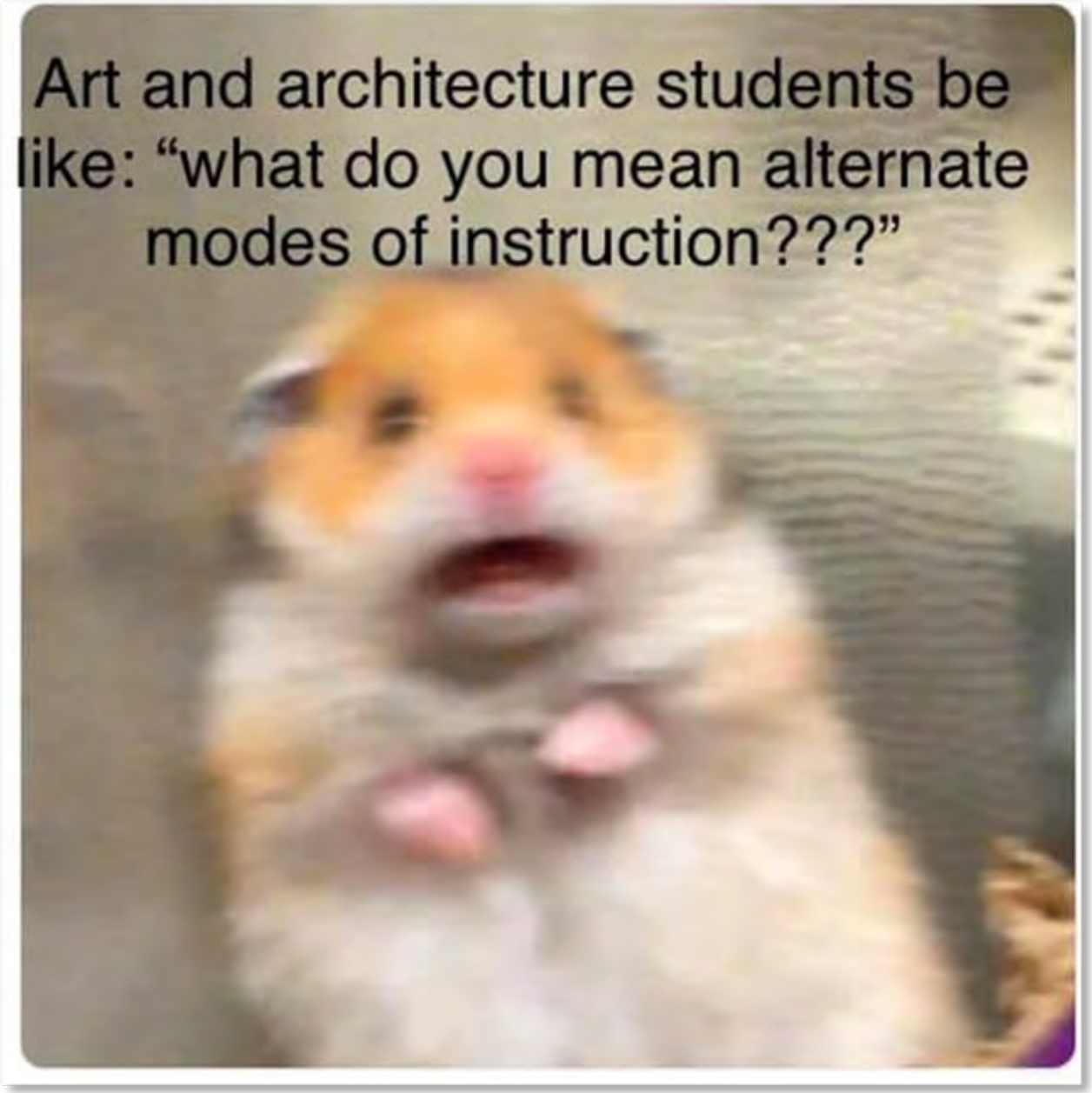
The digital age has changed the nature of studio classes.

- Students spend increasing amounts of time absorbed in their individual screens
- Physically together yet working alone

Studio Culture: Digital Age

Studio Culture: Digital Age

Instructional Problem



Seen on Facebook page: Meme Holyoke

Research Problem

Instead, we continued to function. This suggested to me that we are not doing enough while in the classroom. I decided to explore whether the studio could serve as Active Learning Classroom (ALC).

Conceptual Framework

Constructivist Theory of Knowledge

- Knowledge is socially constructed by students
- Teachers' role: facilitate learning rather than impose knowledge
- Teacher is the guide on the side rather than the sage on the stage

- Creating the opportunity for students to have educational experiences that are based on social contact and communication is the foundation for active learning and active learning classrooms.

Active Learning Classroom (ALC)

- ACLs provide conditions conducive to constructivist educational experiences

Social & Physical Environment

Active Learning Classroom:
Learning Space

- Flexible
- Spacious
- Student centered (elimination of the back of the room phenomenon)
- Instructor station at the center of the classroom
- Wheeled chairs
- Large tables (round or rectangular)
- Writable table surfaces
- Continual screens, connected to
- Network operated by instructor

Active Learning Strategies:
Teaching Style

- Problem-based
- Case-based
- Cooperative
- Collaborative
- Group work
- Think-pair-share
- Peer instructions
- Conceptual change strategies
- Inquiry-based
- Discovery
- Technology enhanced

Recent Literature

The match between learning environment and teaching style is important!

Holec, V., & Marynowski, R. (2020). Does it matter where you teach? Insights from a quasi-experimental study of student engagement in an active learning classroom. Teaching & Learning Inquiry, 8(2), 40-163.

Relevant Literature

Introverts are not disadvantaged in group-based Active Learning Classrooms.

Flanagan, K. M., & Addy, H. (2019). Introverts are not disadvantaged in group-based active learning classrooms. *Bioscene: Journal of College Biology Teaching*, 45(1), 33-41.

Relevant Literature

There is little research examining which elements of Active Learning Classrooms (ALCs) are important for maximizing their utility.

Rezaei, A. (2020). Groupwork in active learning classrooms: Recommendations for users. *Journal of Learning Spaces*, *9*(2), 1-21.

Relevant Literature

The training teachers receive is very focused on the technology aspect of ALC's. But it is **not** the technology that makes the difference.

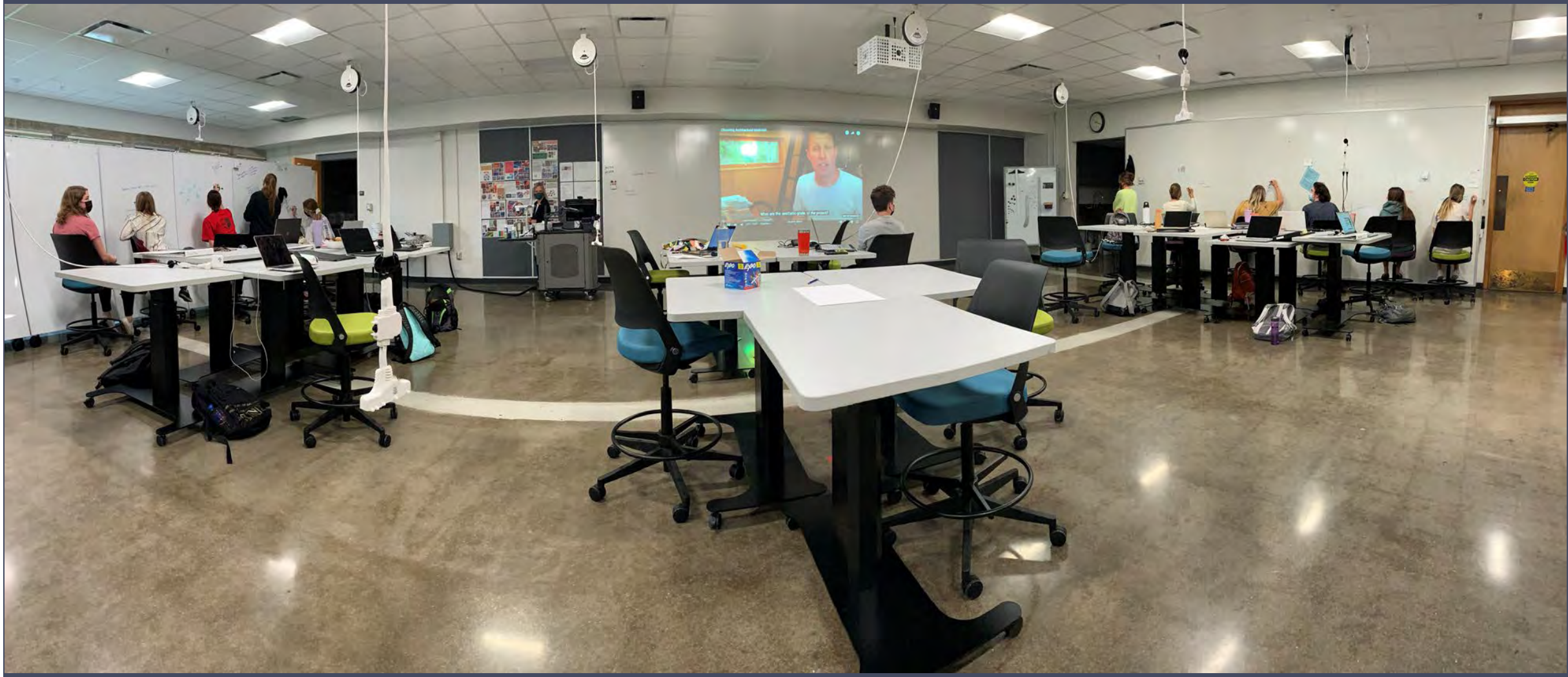
Nicol, A. A., Owens, S. M., Le Coze, S. S., MacIntyre, A., & Eastwood, C. (2017). Comparison of high-technology active learning and low-technology active learning classrooms. *Active Learning in Higher Education, 19*(3), 253–265.

Studio Space

2017 Furniture arranged centered on instructional projection

2020 Furniture arranged for social distancing

Studio Space



2021 Furniture arranged in three clusters

Studio Space

2021 Students engaged in individual work during class time

Studio Space

2017 Group presentation and crit

2021 Individual presentation and crit

Spatial Qualities

Studio Space 2019:

Middle school classroom vibe

- Large, massive, furniture too heavy to be rearranged regularly
- Furniture arrangements in rows, centered on instructor projection at the front
- Insufficient opportunities to display student work
- Improvised and messy materials library
- Fixed lighting

Studio Space 2021:

Unique learning space vibe

- Small scale, light, movable, and adjustable furniture
- Changing arrangements
- Students understood 3 group pods rectangular to the instructor projection as standard layout
- Spacious
- Expansive whiteboard walls that double as presentation surfaces
- Organized tidy materials library
- 3 virtual reality workstations
- Lighting laboratory
- Ample storage for instructional materials and student work
- Adjustable lighting

Instructional Interventions

Active Learning Strategies 2019:

- Problem-based
- Case-based
- Inquiry-based
- Cooperative
- Group work
- Peer instructions

Active Learning Strategies 2021:

- Problem-based
- Case-based
- Inquiry-based
- Cooperative
- Group work
- Peer instructions

- Think-pair-share
- Increased use of hand sketching assignments
- Activities on whiteboard walls

Research Question

How do in-class activities at the whiteboard walls of the studio space affect student-to-student interactions?

Methods

Methods-training for undergraduate research assistants

- How to write ethnographic field notes avoiding judgement
- How to conduct an effective interview
- Set up templates for:
  - Fieldnotes
  - Researchers' reflexive journals
  - Interview guide
- Biweekly meetings to:
  - Coordinate data collection proceedings
  - Discuss observations

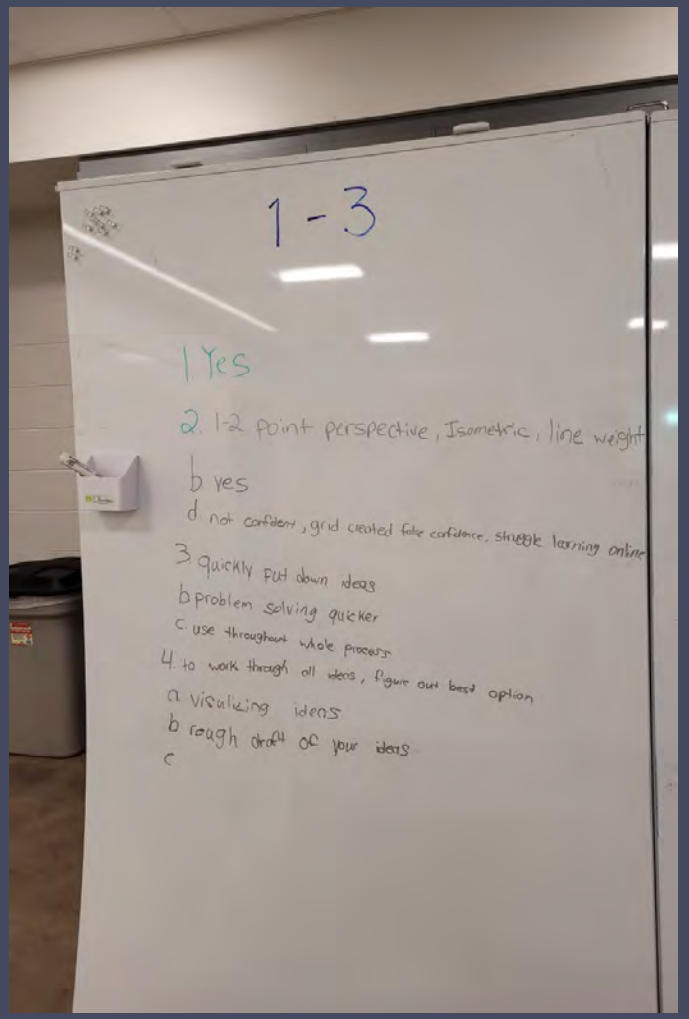
Data collection conducted by students' peers

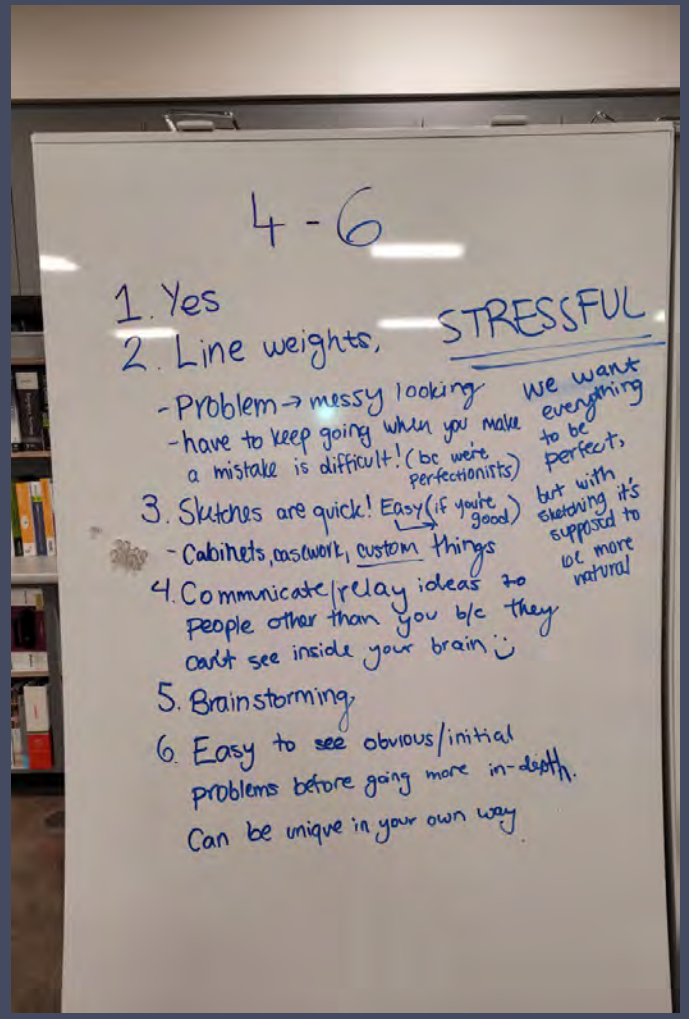
- Observations
- Field notes
- Photos including captions
- Semi structured Interviews of 5 purposefully selected student participants
- IDEA evaluation comments from all enrolled students

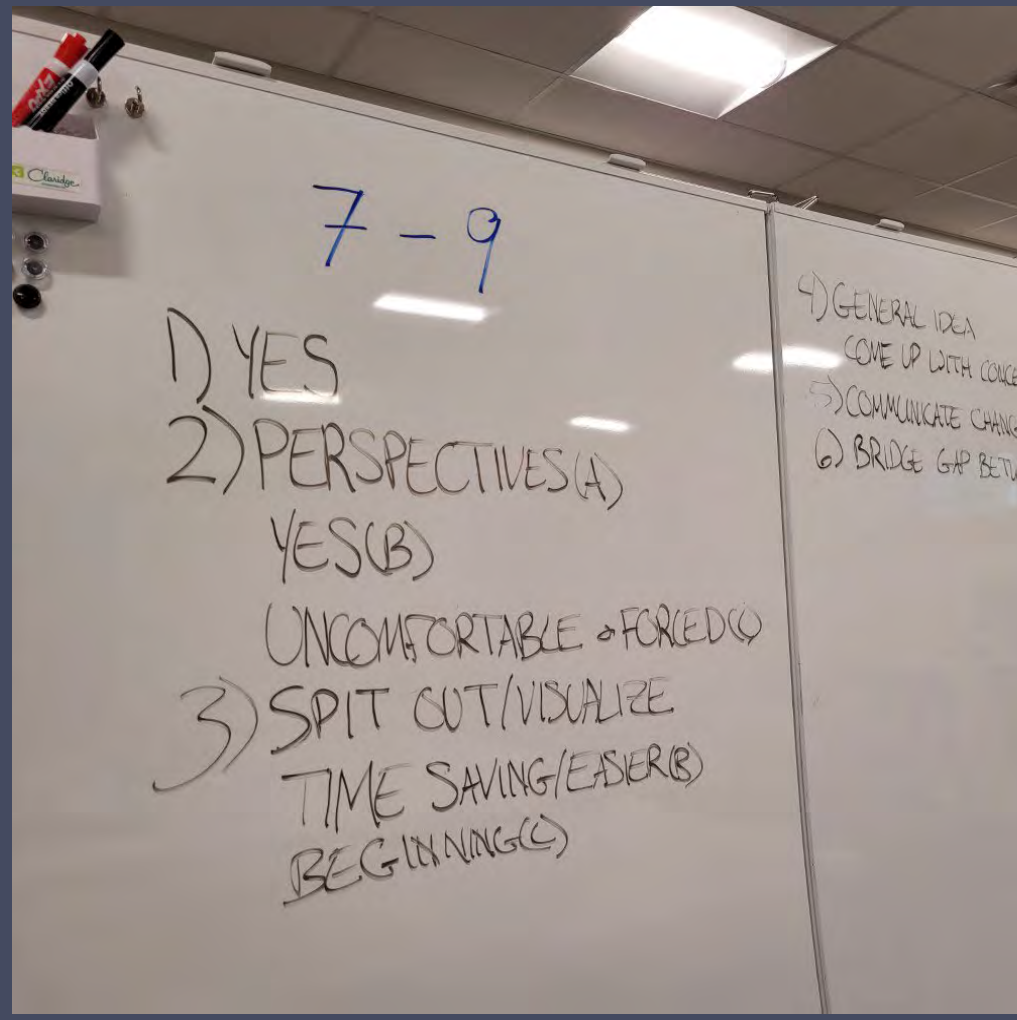
Data analysis by instructor

- Qualitative data analysis software
- 2-phase coding process, open and focused coding
- Theme development
- Cross case analysis

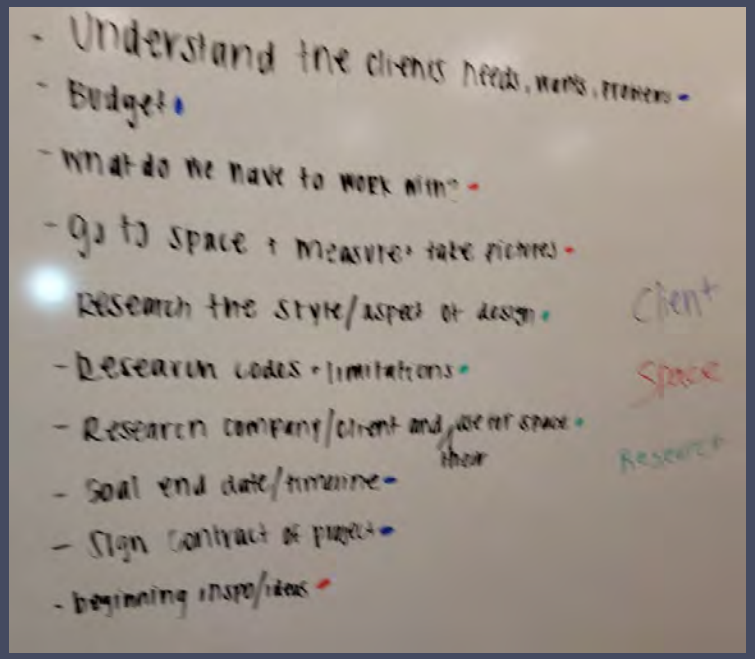
First Day of Class

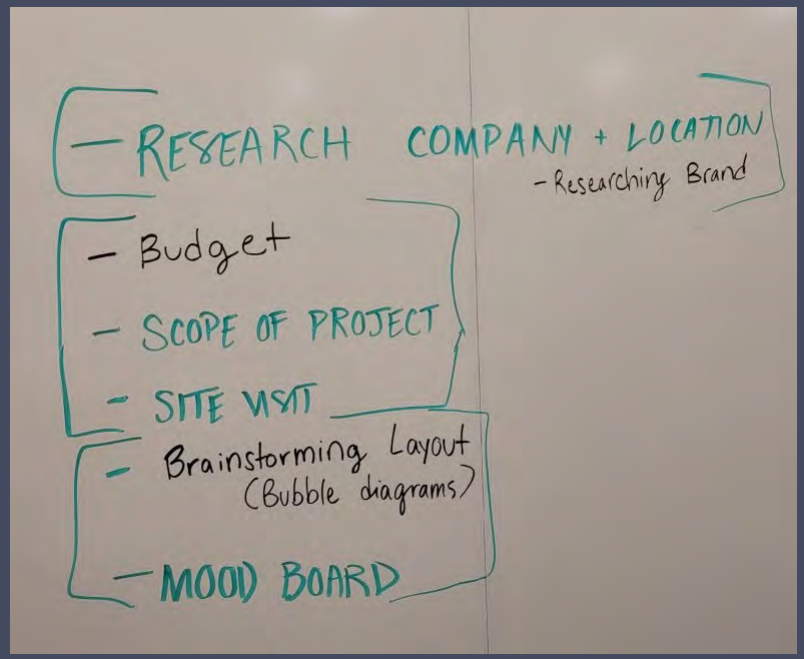


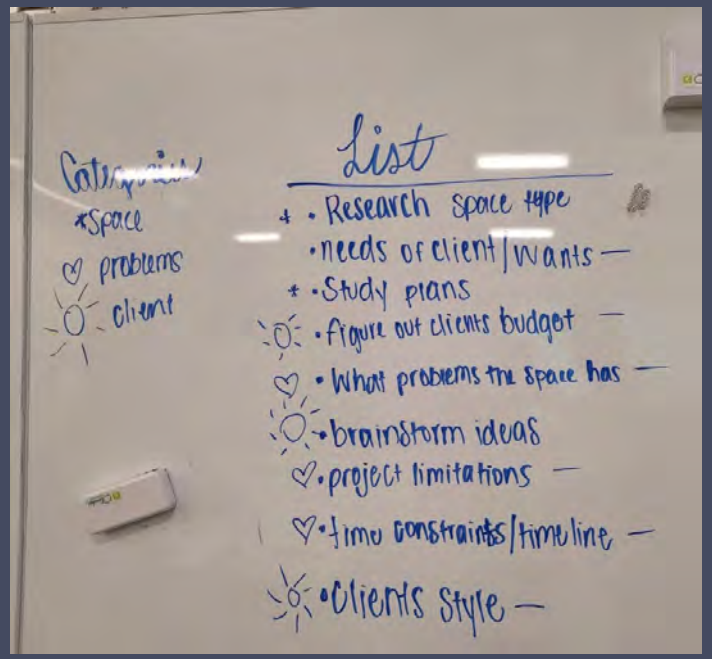


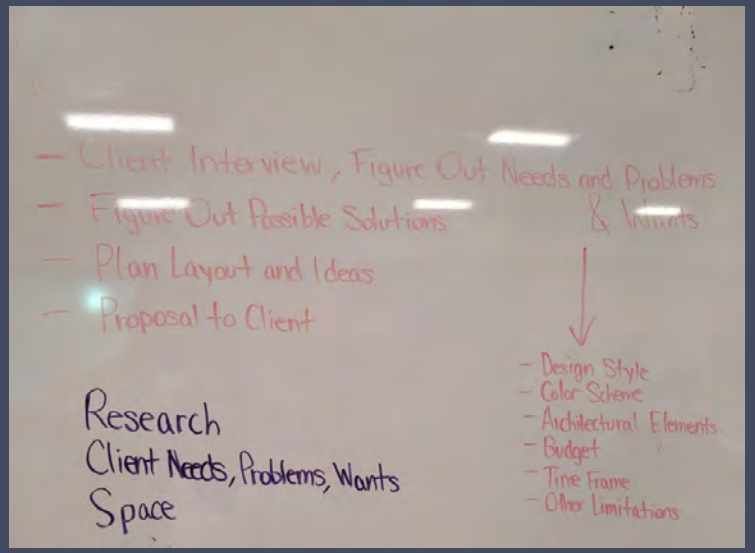


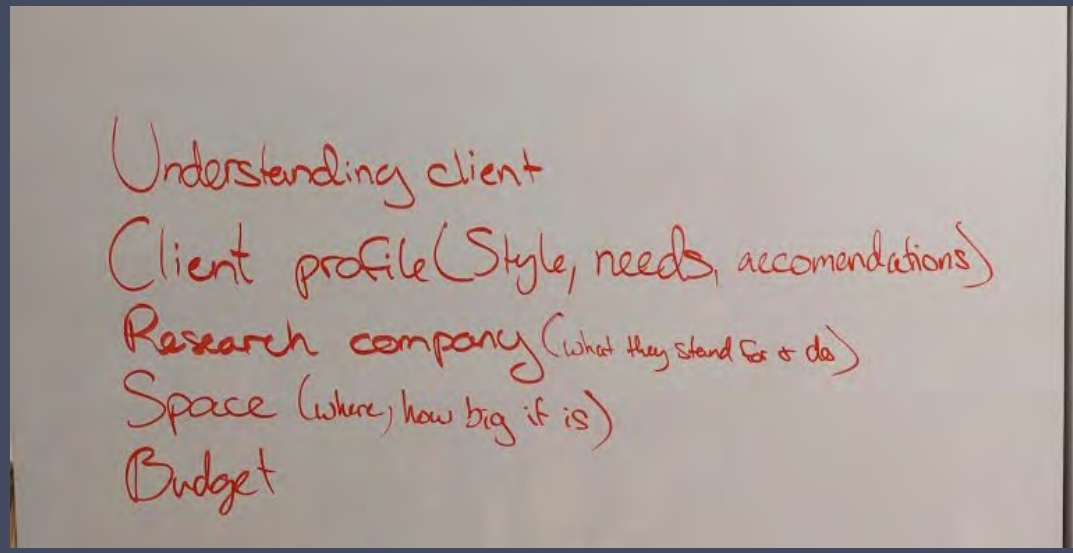
Understanding the Design Problem

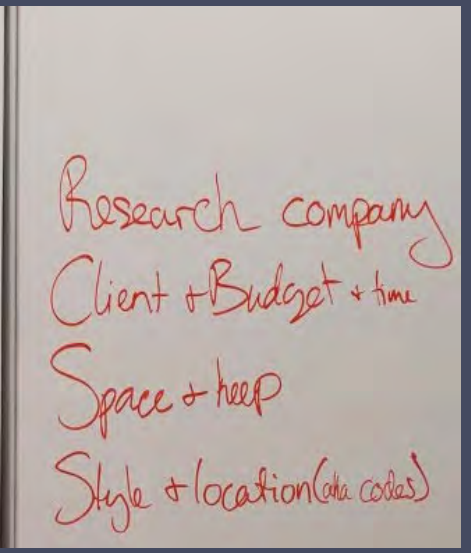






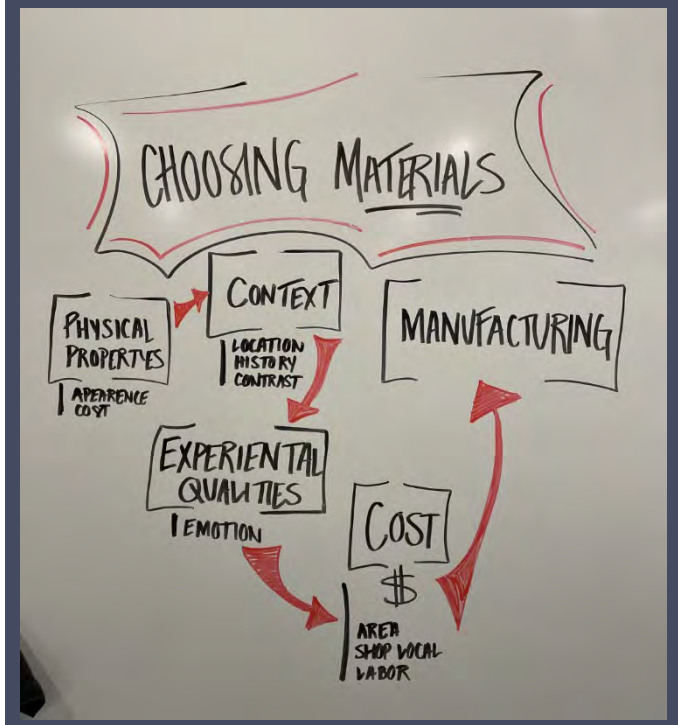


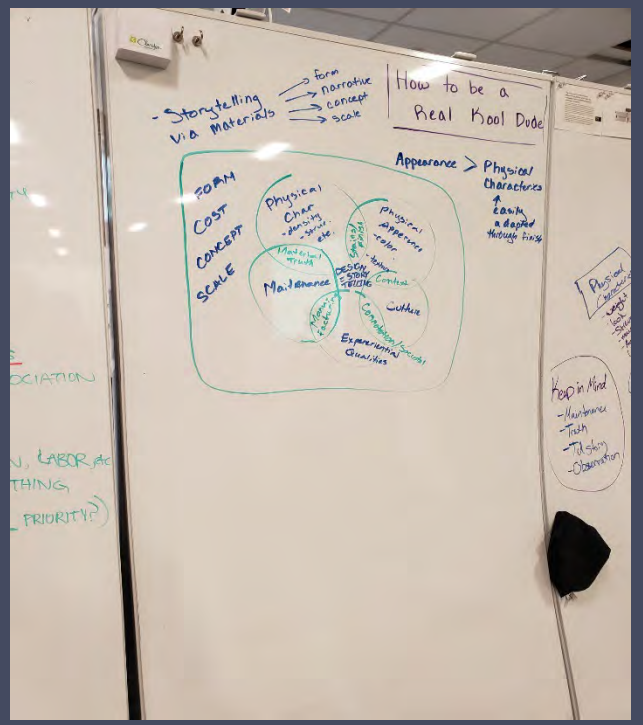


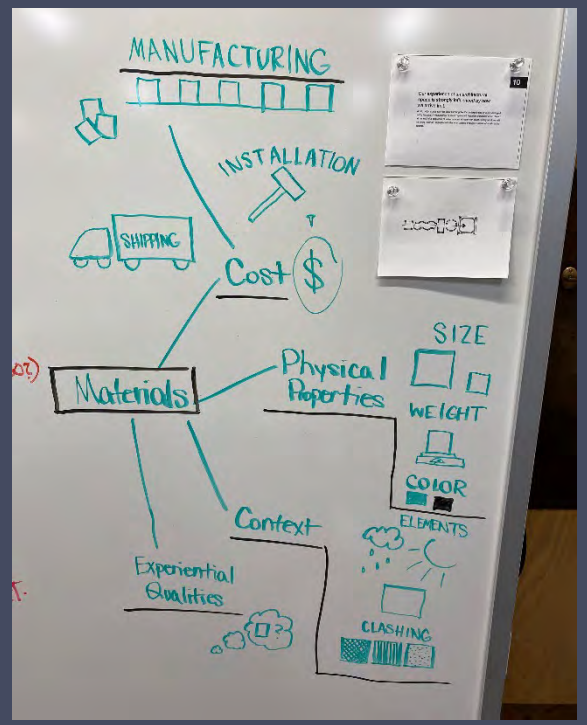


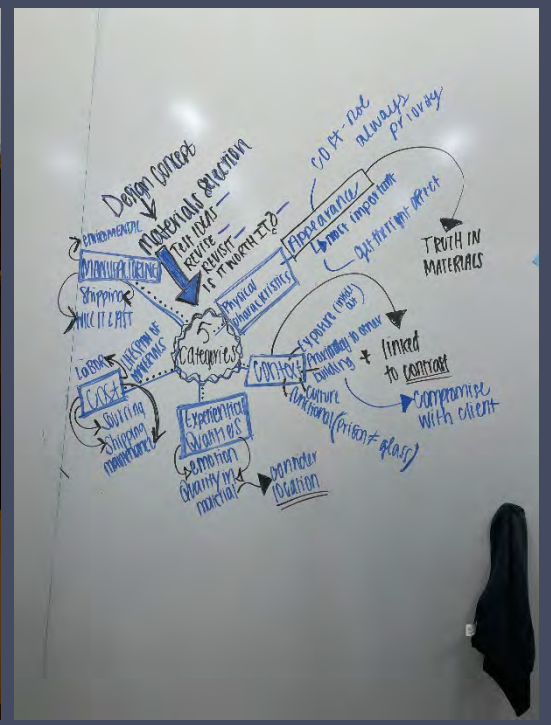
Visualizing a Complex Process

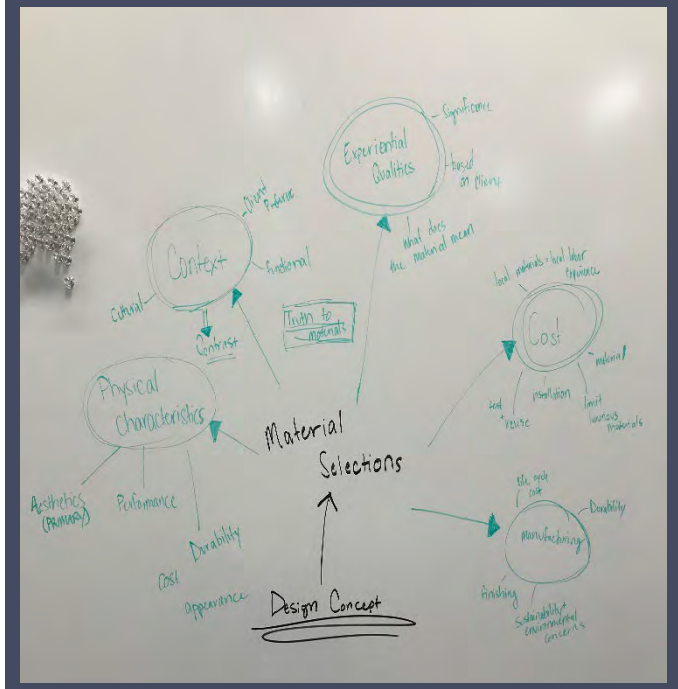
Diagrams

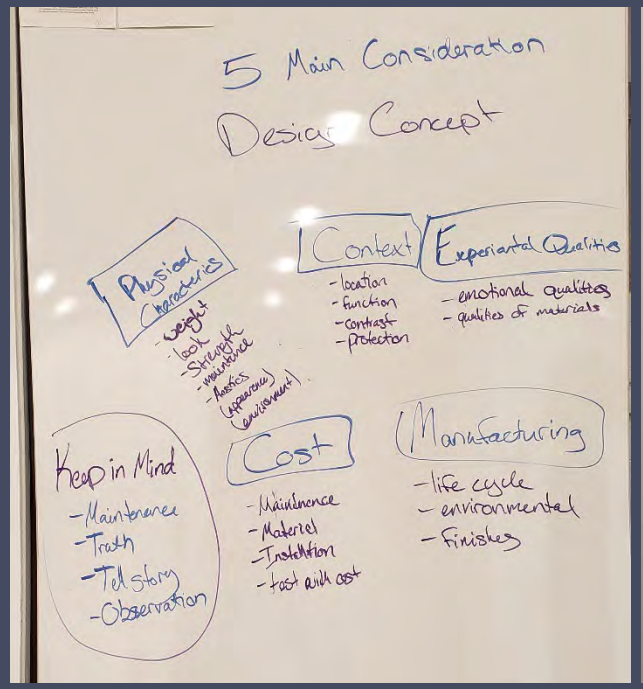

CHOOSING MATERIALS
PHYSICAL PROPERTIES
APPERENCE
COST
CONTEXT
LOCATION
HISTORY
CONTRAST
MANUFACTURING
EXPERIENTAL QUALITIES
EMOTION
COST
$
AREA
SHOP LOCAL
LABOR

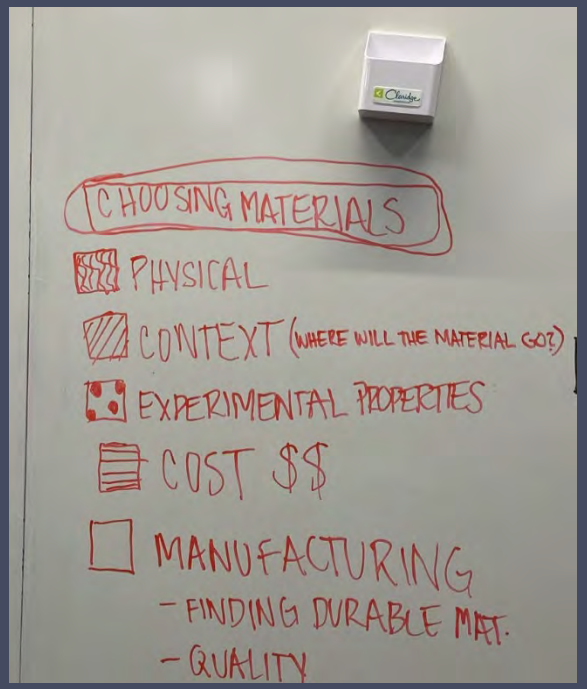

- Storytelling via Materials
form
narrative
concept
scale
How to be a Real Kool Dude
Appearance > Physical Characters
FORM
COST
CONCEPT
SCALE
Keep in Mind
-Maintenance
-Truth
-Tell Story
-Observation

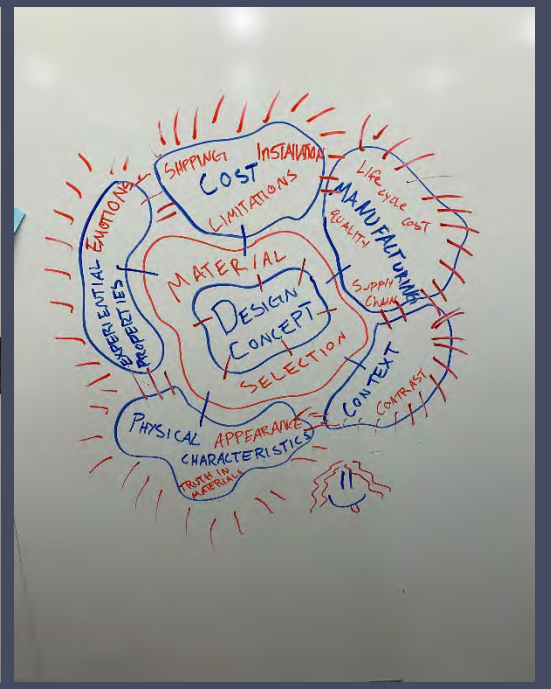

MANUFACTURING
INSTALLATION
SHIPPING
Cost
$
Materials
Physical Properties
SIZE
WEIGHT
COLOR
ELEMENTS
Context
Experiential Qualities
CLASHING


Design Concept
MATERIALS SELECTION
TRUTH IN MATERIALS
5 Categories
linked to context
compromise with client

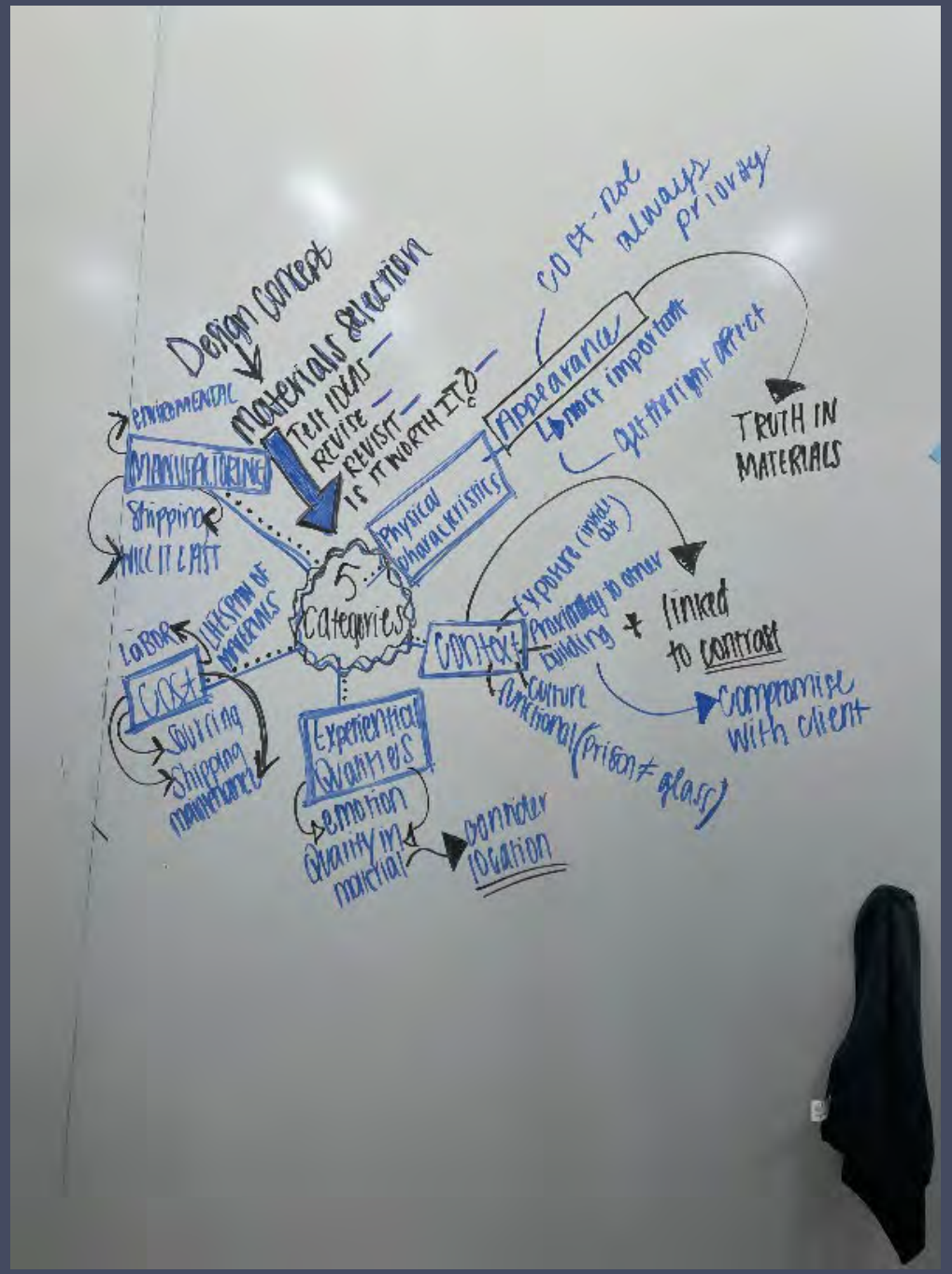

Experiential Qualities
Context
Cost
Physical characteristics
Material Selections
Design Concept
Aesthetics (PRIMARY)
Performance
Durability
Cost
Appearance
Manufacturing


5 Main Consideration
Design Concept
Physical Characteristics
- weight
- look
- Strength
- maintenance
- Aesthetics (appearance)
Context
- location
- function
- contrast
- protection
Experiental Qualities
- emotional qualities
- qualities of materials
Keep in Mind
-Maintenance
-Truth
-Tell Story
-Observation
Cost
-Maintenance
-Material
-Installation
-cost with cost
Manufacturing
-life cycle
-environmental
-finishes


CHOOSING MATERIALS
PHYSICAL
CONTEXT (WHERE WILL THE MATERIAL GO?)
EXPERIMENTAL PROPERTIES
COST $$
MANUFACTURING
- FINDING DURABLE MAT.
- QUALITY


COST
LIMITATIONS
MATERIAL
DESIGN CONCEPT
SELECTION
CONTEXT
CONTRAST
PHYSICAL APPEARANCE CHARACTERISTICS
TRUTH IN MATERIALS
EXPERIENTIAL PROPERTIES
SUPPLY CHAIN
LIFE CYCLE COST

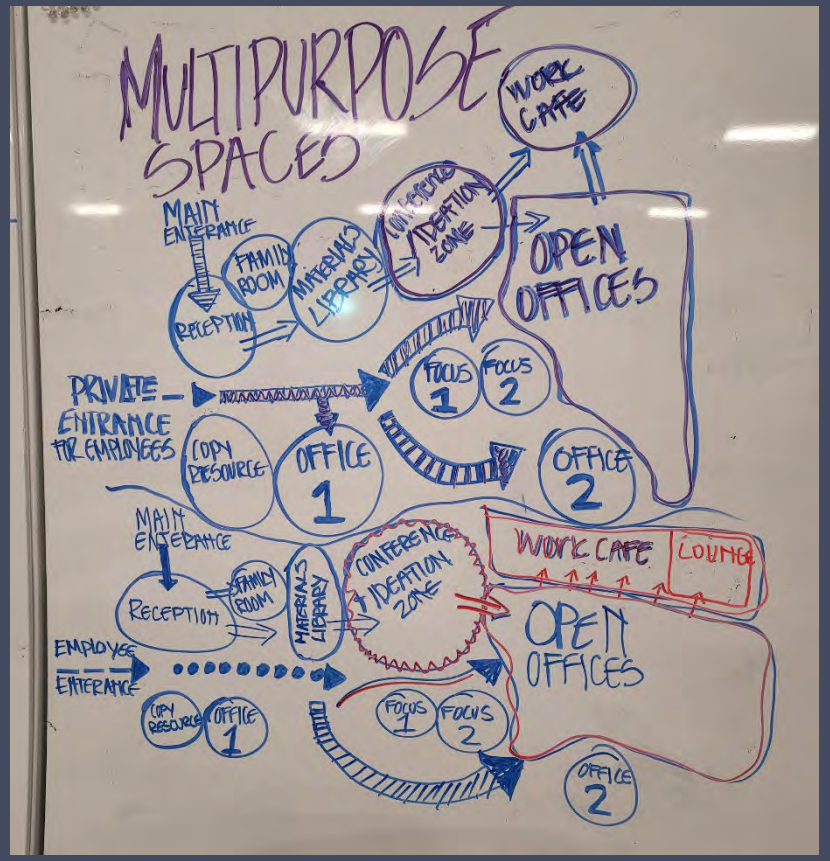
Diagrams

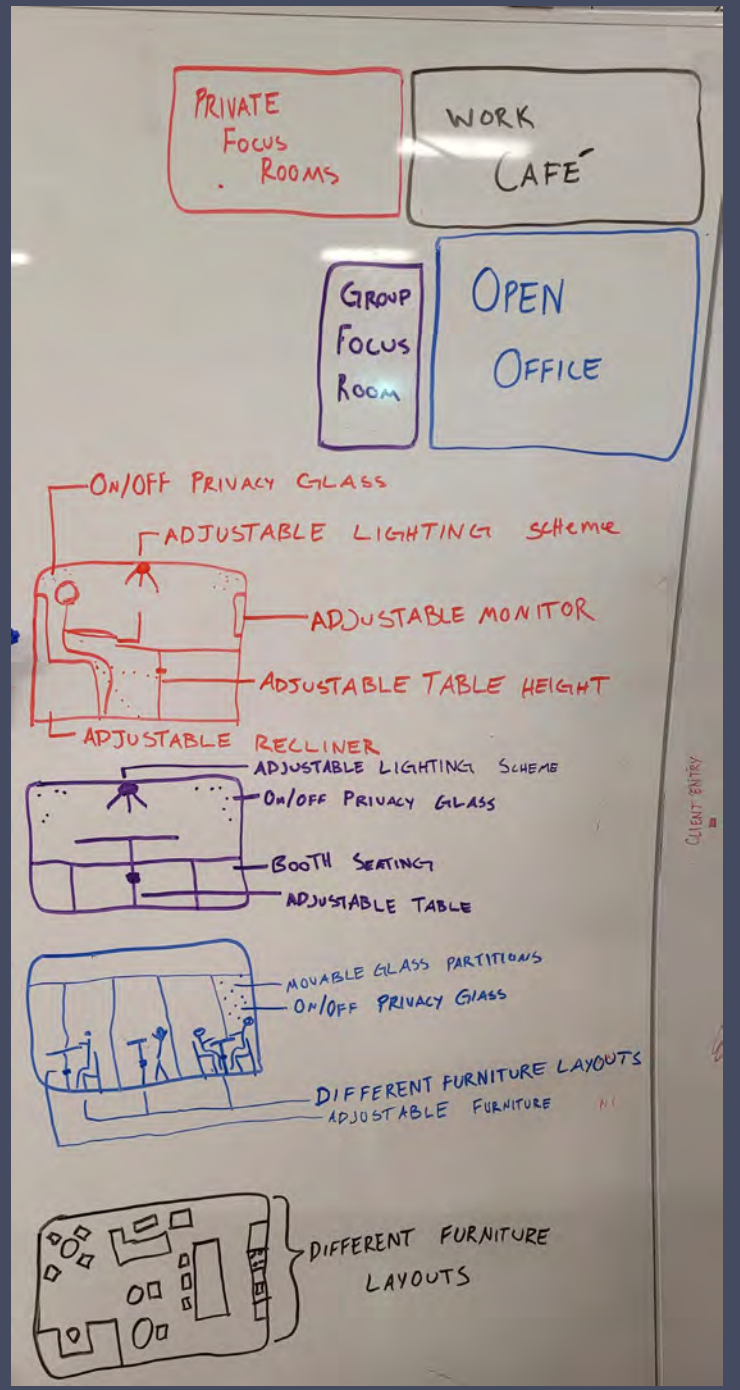

Design concept
Materials selection
Test ideas
Revise
Revisit
Is it worth it?
Environmental
Manufacturing
Shipping
Make it last
Physical characteristics
Appearance
Cost - not always priority
Users important
Different effect
TRUTH IN MATERIALS
5 categories
Lesson of materials
Labor
Cost
Cutting
Shipping
Maintenance
Experiential qualities
Emotion
Quality in material
Consider location
Context
Exposure (inside/out)
Proximity to other buildings
+ linked to context
Culture
Functional (Prison ≠ glass)
Compromise with client

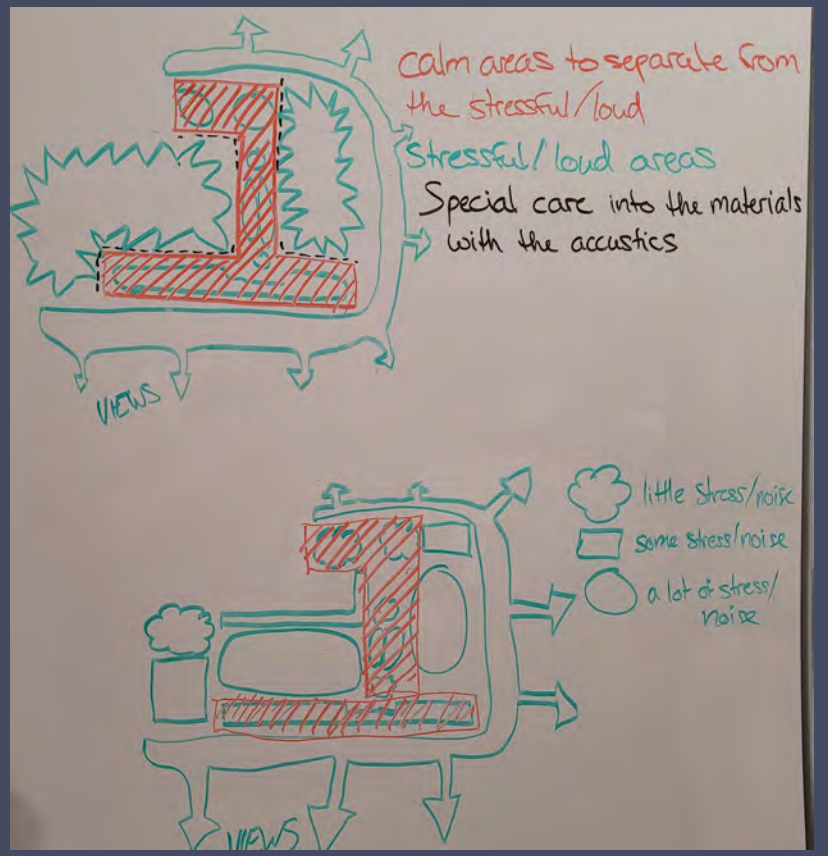
Program Analysis

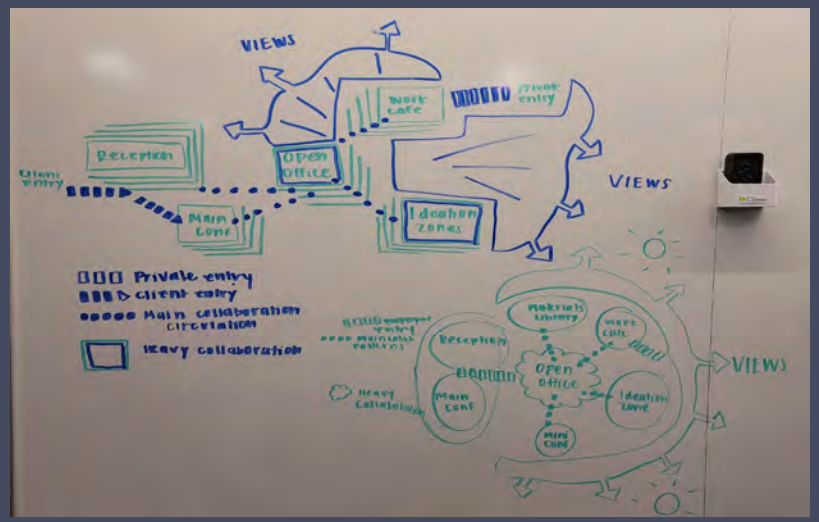
Conceptual Development

Concept Development









Findings and Evidence

Most students enjoyed the whiteboard activities.

- I did love the whiteboard activities I like them and feel they helped to take away the pressure of sketching on paper.
- I really enjoyed them because they were easier to correct mistakes and make changes
- I loved that because it gave me a break from the desks and got me up and moving.
- I liked them it was definitely different and a bit out of my comfort zone but that is not a bad thing
- I liked doing the whiteboard activities because it felt more relaxed and was a good way to get my ideas down quickly.
- I liked it. It was nice to see everything visually because I am a visual learner.
- I enjoyed it because it felt like I had so much space to put my thoughts/ideas into reality
- I LOVEEEEEEEEE THEM
- I enjoyed the whiteboard activities. It gave us a short break from our projects. The activities also gave us good information to use within our projects.

Findings and Evidence

Students talked to each other. Interactions were focused on class contents.

- I like to focus on my own design project more than collaborating with others. But when I get stuck on something for too long, I find it very useful to reach out to my peers and ask for their opinion. Design is so subjective, so it's important to consider other people when designing a project.
- I need focused work time but being able to work in the studio with others and bounce ideas off of each other is critical for me.
- It usually depends, at the beginning of the semester I would have rather done more work on my own but as the course continued it was nice to work with others.
- I talked to my peers during the activities. It would mostly be about asking their opinion on something or finding the best way to go about a problem I was having. We would just work together to solve design issues.
- Collaborating on ideas to solve certain issues or get their advice.
- We talked about the ideas we each had and our opinions on each others work, to improve all together.
- Just about things we were putting, and what adjectives to use, etc.
- We helped each other with ideas and ways to make our ideas better.
- We discussed a lot about what we were drawing and how was the right way to do it as well as giving ideas or saying what looks really nice or is working well.
- We bounced ideas off of each other and helped each other understand what we messed up on.
- About each others' ideas to inspire each other.
- To get ideas about how to start things and to organize my thoughts
- I liked getting advice from people and being able to ask questions about things I didn't understand.

Findings and Evidence

Working on whiteboards suggests process which students associate with lower stakes.

Working with pencil on paper:

- Pencil on paper, just felt more permanent. (Becky)
- Being on paper seems a lot more permanent. (Sally)
- If I work on paper, I feel like I need to think this entire thing out before I even draw one circle. (Sally)
- With a pen and pencil, paper and pen. Like it has to be perfect. (Victor)
- I feel like if it's a piece of paper you have to turn it in. So I'm going to try to make it perfect. (Victor)

Working on the whiteboards:

- If I messed up, it was just so easy to erase it, it was so easy to start over, or if it looked terrible, I knew that wasn't my final thing. (Becky)
- This would've been easier on a whiteboard. We have so many of them and are in such a big space. (Sally)
- The whiteboard makes you think bigger because it is bigger. (Victor)
- Growing up, like elementary school where you'd do fun simple math games, or you'd just draw. That's why I feel like it's fun because we can be silly and draw in different colors. (Victor)
- It kind of tricks us into doing it and there's no pressure or anything. (Victor)
- They are informal. (Victor) There is not that pressure. (Victor) It was a casual experience. (Victor)
- It's not as big of a deal. (Mary) I just find it a little bit more casual. (Mary)
- The whiteboards did help me get through that block a little bit. (Mary)
- I feel like standing you're moving around, it gives more of an opportunity to walk to someone else and be like, "Oh, how you doing?“ (Mary)
- There's just something about it that it's not as much pressure. And I think maybe its a way to promote more collaboration. (Mary)

Discussion

- We observed a lot more course related interactions between students than in previous semesters, especially during the whiteboard activities.
- Overall, I received a lot deeper developed design solutions.
- I observed richer exploration of both the design problem and the design solutions, rather than overly linear developed design solutions.
- Students seemed to enjoy the process more.

- I asked them to do and produce substantially more than I have before.

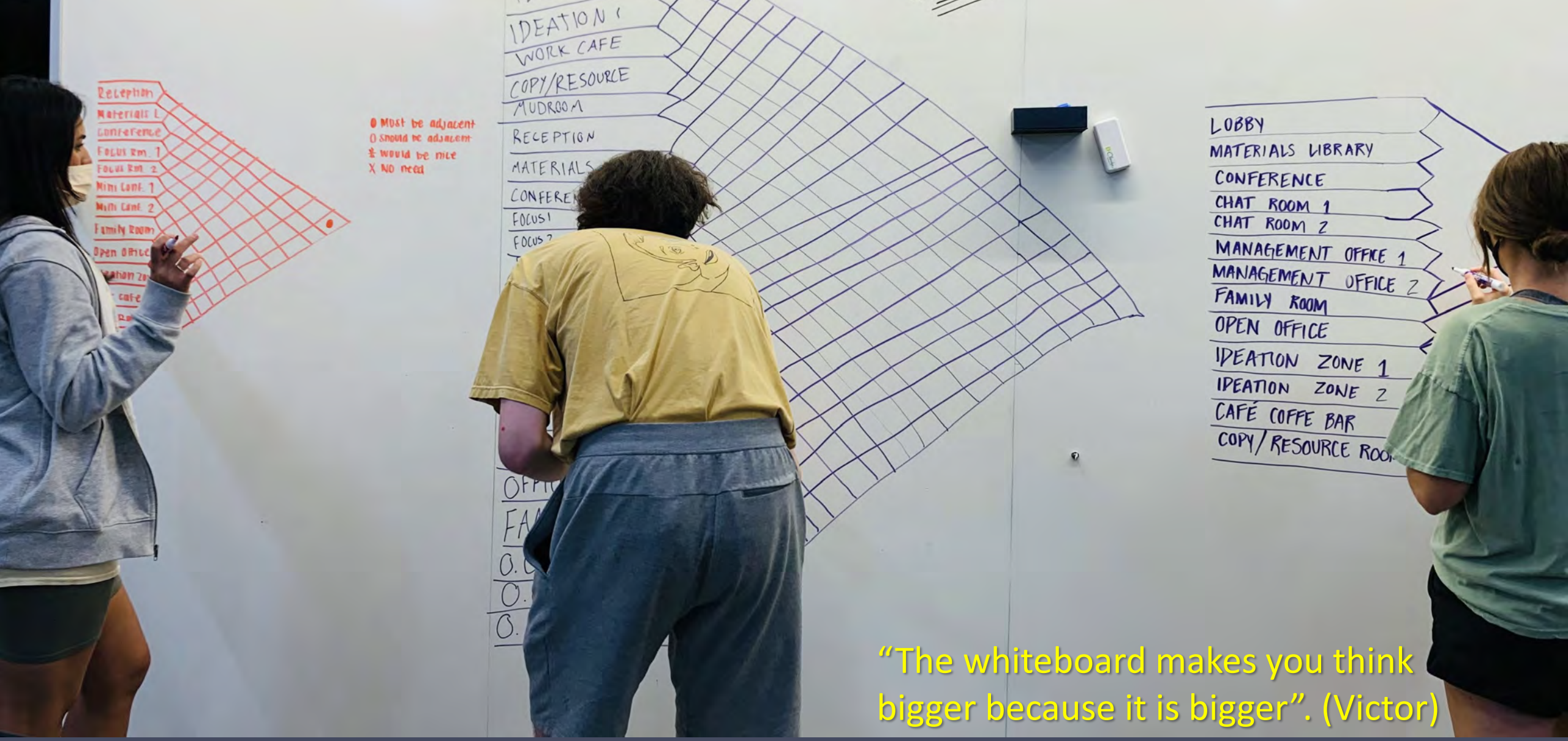
Recommendations

If you are trying to foster students' focus on a rich, slow, and steady development process rather than on fast results created in an overly linear process:

- Experiment with unconventional/nonpermanent media (not commonly associated with the final product) during instructional times.
- It might decrease anxiety, foster exploration, and iterations instead of the one-and-done approach we often see.

If you are trying to promote student-to-student-interactions as part of an active learning classroom (ALC):

- Have large amounts of writeable wall surfaces added to your classrooms.
- Explore the social affordances by implementing creative in-class assignments at these walls.
- I suspect that this low-tech intervention to the physical environment can help foster a more cooperative learning environment.



"The whiteboard makes you think bigger because it is bigger". (Victor)

"(~~No~~) Go Writing on the Wall": Creative Thinking Modes and Collaboration

Thank you! Do you have questions for me?