

Honors Thesis Submission Form

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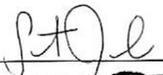
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Thesis Title: Thinking, Making, Speaking

Abstract (200 words max): Architecture is a field in which designers bring what is imagined to the physical world. At the University of Florida School of Architecture, students are given the backbones of the design process: thinking, making, and speaking. Through these processes, they discover that the goal is not the final product but learning through the process. They think, they make, they speak. They repeat. It is in this repetition and the way that they bring lessons from old projects into new ones that teaches them how to be better designers. Design/Build is a crucial step in this curriculum because of the way that it reinforces and challenges the use of thinking, making, and speaking. Through previous design studios, students have been prepared for adapting these processes to building at a 1:1 scale. With the tools that they have, they are ready to tackle the challenge of consensus design and the reality of materials.

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Introduction

An architect's final product is a space in which to dwell. Given a prompt, an architect's task is to imagine how to turn this into a physical space. At the University of Florida School of Architecture, students learn how to produce this. Whether given a story from a professor or a very particular set of programs from a client, students are urged in school to create a narrative, a motive, that will guide them through the project. As designers, they use this narrative to question and imagine how they want people to dwell within the spaces they will create. How will people move? Where will they pause? What will they accomplish? These questions are guidelines for the way that a particular dwelling will be framed. The design and creation of spaces is derived from the thought process.

While it might seem like the final product is the goal, it is really the investigation (led by curiosity) that drives a creator's mind. The architect's true goal lies within the inception and ongoing creation of a project; it lies within the process itself. At the University of Florida, there is a joke that "we are always never done." In an interview with the University of Florida Graduate School of Architecture, Billie Tsien says, "What I found very difficult is things never seemed to be finished and when you tied up the bow on one side, it was coming undone on the other side."¹ This is especially true in school because students are encouraged not to aim singularly for that final product. They are taught to constantly ask, "How can I push this project further? How can I make this project better?"

In the University of Florida's curriculum, students are primed for a blending of making, thinking, and speaking. Through this process, they not only create that "final" product, but also learn what it is to be a designer and creator. This field is caught between the mind and the

¹ Billie Tsien and Tod Williams, "Process, Not Project: Holding on to the Real," in *Vorkurs: Making*, ed. Elizabeth Cronin and Zachary Wignall (Gainesville, University of Florida School of Architecture, 2017), 48.

physical world and it is in the space between the two that architects dwell. Ideas are thought through, communicated with others, and drawn or built into the physical world. It is not a linear process but a constant back and forth between thinking, making, and speaking. And it is done again. And again. And again. In his book, *The Perception of the Environment: Essays on livelihood, dwelling, and skill*, Tim Ingold writes, “Building, then, is a process that is continually going on, for as long as people dwell in an environment. It does not begin here, with a pre-formed plan, and end there, with a finished artefact. The ‘final form’ is but a fleeting moment in the life of any feature.”²

Curiosity – about how things are made, how people move, how people think, what can physically be done with available materials – is what leads students to keep pushing forward. Even when projects are put down after the final review, the lessons and questions discovered are brought into the next one. True value is found in the process, not in the product.

Through four years of Architecture School at the University of Florida, thinking, making, and speaking have been the framework components of the design process. From *Cube* in Architectural Design One to *Block* in Architectural Design Seven, each project is derived from this design process. Even projects in other classes, like *Luminaire* in Environmental Technology II or *Newspaper* in Theory II are products of this same mixing of thinking, making, and speaking. In each project, students make, think, discuss and repeat.

This prepares them for the next step: the creation of something at a 1:1 scale. All projects prior to Architectural Design Eight have been primarily represented with scaled drawings and models. These forms of making are an integral step to understanding space and creating it, however, these projects have lacked the full impact of materials and scale – two critical elements

² Tim Ingold, “Building, Dwelling, Thinking: How Animals and People Make Themselves at Home in the World,” in *Perception of the Environment: Essays on Livelihood, Dwelling, and Skill* (New York: Routledge, 2000), 188.

of architectural design. Design/Build is driven by the same creative processes of thinking, making, and speaking, but pushes students into a realm where materials are a reality and the created spaces can be physically occupied and experienced. Through previous design studio studies, students have been prepared for exactly this next step where the same process of making, thinking, and speaking is used to tackle these new areas of materials and scale.

Thinking

It is easy to think that the heart of a designer's work is in the making of physical things. However, making could not be done without thinking. Making is an integral part of the design process, but most of a designer's time is spent thinking. Even when students walk away from studio, they will think about ways to push their projects forward. Tim Ingold, referencing Joseph Rykwert, asserts that "...the essence of architecture lies in 'taking thought about building.'"³ Thinking, imagining, and envisioning are the backbones of creating.

At the University of Florida School of Architecture, projects begin with a prompt. This could be something as broad as "holding fire and water in the Florida Landscape" (Architectural Design Five) or something as specific as "sleeping, living, and working quarters for scientists in an Antarctic desert" (Architectural Design Four). Immediately, a thousand ideas and directions will come into a student's mind.

³ Tim Ingold, "Building, Dwelling, Thinking: How Animals and People Make Themselves at Home in the World," in *Perception of the Environment: Essays on Livelihood, Dwelling, and Skill* (New York: Routledge, 2000), 182.

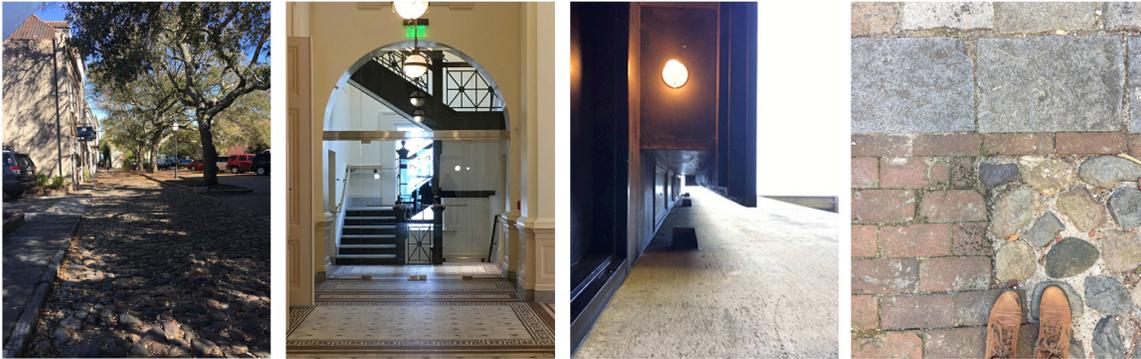


Figure 1: Images from Charleston, South Carolina

The field of ideas is narrowed down with research. The context is investigated by reading through history and looking at maps and images of the place in order to determine the key characteristics and major boundaries. Programs and functions are considered as well as their adjacencies – how should these things be arranged? What are the relationships between programs? Precedents are studied – what elements make these projects successful? How can those ideas be integrated into the current project?

In the University of Florida curriculum, there is also the opportunity to visit specific places. In Architectural Design Six students travel to Savannah, Georgia and Charleston, South Carolina (Figure 1). In Architectural Design Seven, they visit New York City. These visits give students a chance to experience the place with their own senses. They inhabit it. They notice things about the environment that they would never get from pictures. They make visual connections between sites in the city, feel the cobblestone beneath their feet, watch how people interact, and smell food from nearby restaurants – all things that can play a role in how they move forward in a project.

Todd Williams and Billie Tsien believe this type of interaction to be vital to design and try to bring it into their projects when they teach. In an interview with *Vorkurs*, Tsien says that

“you need to look at more than architectural precedents in order to think about how people inhabit spaces ... experiences, how a place feels, continues to be for us one of the most important and crucial things we look at when we are making place.”⁴

All of this can be considered before a pencil even touches paper or pieces of wood are glued together. However, thinking does not only occur at the beginning of the project. In fact, the design process is led by this thinking and curiosity. Ingold writes, “Human beings do not construct the world in a certain way by virtue of what they are, but by virtue of their own conceptions of the possibilities of being. And these possibilities are limited only by the power of the imagination.”⁵ The thinking never ends but pushes the project forward even after models are built and drawings are pinned up. In a process that Professor Charlie Hailey calls “Reflective Building,” students look “backward and forward.”⁶ This leads to deeper investigation and, oftentimes, more research. The things that are learned are carried into subsequent projects and act as the groundwork upon which new ideas are considered. Students continue to question the joints, the form, the adjacencies.

They think.

⁴ Billie Tsien and Tod Williams, “Process, Not Project: Holding on to the Real,” in *Vorkurs: Making*, ed. Elizabeth Cronin and Zachary Wignall (Gainesville, University of Florida School of Architecture, 2017), 49.

⁵ Tim Ingold, “Building, Dwelling, Thinking: How Animals and People Make Themselves at Home in the World,” in *Perception of the Environment: Essays on Livelihood, Dwelling, and Skill* (New York: Routledge, 2000), 177.

⁶ Charlie Hailey, *Design/Build with Jersey Devil: A Handbook for Education and Practice*, (New York: Princeton Architectural Press, 2016), 123.



Figure 1: Wuppertal Mapping, Architectural Design Four, Critic: Kristin Nelson

Making

Architects take what is in their minds and bring it to life in the physical world. They are builders, bringing into existence what was previously only imagined. This gap between mind and physical world is bridged with hands through making. In their article *Oculata Manus*, Professors Lisa Huang and Bradley Walters write, “architecture is not exclusively an intellectual project, but rather something that engages the hands and body as well. ... Through critical work of the hands, students of architecture can calibrate their hands and eyes to allow them to work together more fluidly.”⁷ Students use everything from sketching to scale models to train their hands.

Research and ideas are brought together in making. One example is the mapping of Wuppertal, Germany from *Tower* in Professor Kristin Nelson’s Architectural Design Four

⁷ Lisa Huang and Bradley Walters, “Oculata Manus,” in *Vorkuers: Making*, ed. Elizabeth Cronin and Zachary Wignall (Gainesville: University of Florida School of Architecture, 2017), 40.

studio. The investigation of the city led to the mapping of its neighborhoods, important places and parks, major roads, and suspension railway. The way that these several key characteristics visually overlapped and interacted let to a deeper understanding of the city and a tower design that arose from the city itself (Figure 2).

Through making, students learn how to frame space. In Professor Charlie Hailey's Architectural Design One studio, students learned how to connect pieces and pull them apart to create space. This was done with basic materials – wood and glue. Through the very first project, *Cube*, they learn how space moves through an object, how it folds, or how it pauses. Additionally, students learn how to be guided by the materials. The simple question of how to suspend one piece of wood over another opened doors to new possibilities (Figure 3). That piece of wood could be held up by planes of wood or it could be held by a framework of linears. Students were pushed to question these joints and use the materials innovatively, testing the limits of the materials.



Figure 3: *Cube*, Architectural Design One, Critic: Charlie Hailey

Drawing is another medium through which students learn about space. It is particularly helpful in studying adjacencies, light, and occupancy. In *Fire and Water*, from Professor Nina Hofer's Architectural Design Five studio, the prompt was to investigate different ways to interact

with fire and water. The original idea was to offer visitors the opportunity to watch fire through a wall of falling water. Through a series of section sketch investigations (Figure 4), it was discovered that if the two elements were pulled further apart, visitors could also have the ability to walk between the fire and water.

Mapping, building, and drawing are forms of making that students often practice. They are the words in a visual language and a way through which ideas can be communicated. Hands, in conjunction with minds, are used to bring ideas to life. Guided by thinking, students question how the images in their heads can be real. They set out to answer these questions with a visual language.

They make.

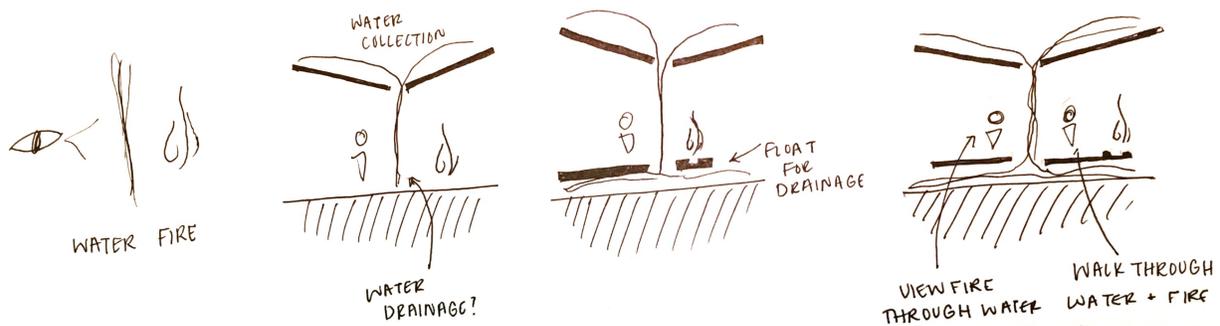


Figure 4: Fire and Water Sketches, Architectural Design Five, Critic: Nina Hofer

Speaking

The process neither begins nor ends with making. Every day in school, students and professors discuss research and the latest batch of drawings and models. Ideas cannot be conveyed with just these physical things, there must be words tied alongside them. Even simple line drawings can be confusing until they are labelled “plan” or “section.” The physical work cannot be separated from language and, in a way, students are framed by it because, as

Heidegger argues, “It is language that tells us about the nature of the thing.”⁸ If a student cannot explain their ideas out loud, how well do they actually understand them?

When teaching, Todd Williams and Billie Tsien encourage their students to summarize their project to two or three sentences. In their own practice, they will sometimes try to get it down to two or three words. They agree that this challenges designers to truly understand their projects and these words serve as a “beacon” through the design process.⁹ This beacon is something against which the project can be measured: is the project living up to its mission? Does the physical object successfully convey its intention? As students move forward from academia to practice, using this measure can help them to create spaces in which the experience speaks for itself.

Language is powerful, not only as a guiding force for individuals, but also as a way to communicate ideas with others. Tsien is right to say that “in general, more people understand words than understand drawings.”¹⁰ Language pushes projects forward just as much as thinking and making. There is a reason that students don’t pin up their work at a final review and walk away. Students talk through their drawings and models. They explain their thought process and then receive critique and suggestions. They ask and answer questions.

They speak.

⁸ Martin Heidegger, “Building, Dwelling, Thinking,” in *Poetry, Thought, Language* (New York: Harper & Row, 2001), 146.

⁹ Billie Tsien and Tod Williams, “Process, Not Project: Holding on to the Real,” in *Vorkurs: Making*, ed. Elizabeth Cronin and Zachary Wignall (Gainesville, University of Florida School of Architecture, 2017), 50.

¹⁰ *Ibid.*, 50.

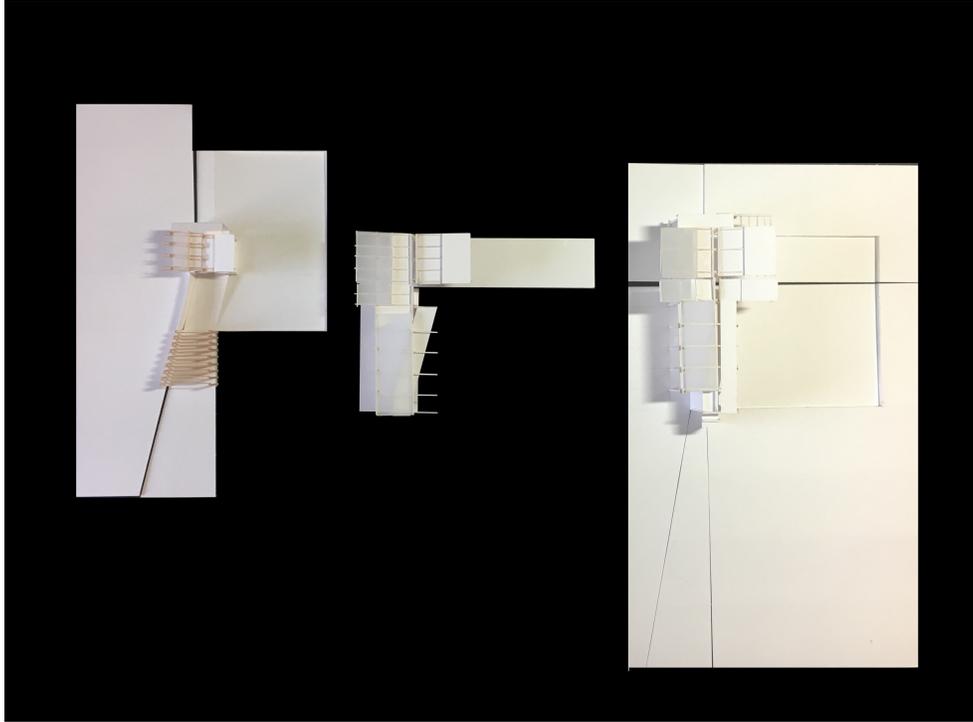


Figure 2: Fire and Water Process Models, Architectural Design Five, Critic: Nina Hofer

Iterations

“So, in architecture, making and thinking are inextricably bound together with imagination, that incredible aspect of the intellect that projects the yet unseen into the possible. The architect can imagine things into being.”¹¹ What Merrill Elam is arguing here is that minds and hands are bound together and the design process must use both. Making, thinking, and speaking are the bones upon which the creative process is built. However, they are not used linearly or in a specific pattern. They overlap and build upon each other as students constantly move back and forth between them. The order through which they design is discovered in tandem with the design itself. They are bound together and, in this process, cannot exist one without the others.

¹¹ Merrill Elam, “Making and Imaginings: How Imaginings of Academia Translate to Practice,” in *Vorkurs: Making*, ed. Elizabeth Cronin and Zachary Wignall (Gainesville, University of Florida School of Architecture, 2017), 85.

The first attempts to make what is envisioned are never final and they push students to re-envision the project. The first pass is never the final pass. In *Fire and Water* (Architectural Design Five), the first model became a springboard for a project that focused heavily on itinerary and overhead. Investigation and discussion with Professor Hofer became the catalyst for two more iterations in model and several drawings, discovering better ways to frame pathways and create joints in spaces through overhead (Figure 5).

Sami Rintala, from Rintala Eggertsson Architects, argues, “the most natural way of learning things is to do them and do them many times, and then you become better at it.”¹² Through the iterations of a project, not only are designs developed, but hands and eyes are also trained to work together to bring to life what is imagined. The process of repeatedly making the same thing teaches about the process itself and opens doors to thinking about the changes that are being made. Professor Nina Hofer writes about the *Repetition Project* in the Research and Methods class in the University of Florida’s Graduate School of Architecture. Students are tasked with doing a short, twenty-minute “daily ritual of making,” in which changes are slow. In this process, “the things that are produced are minor ... daily practice begins slowly to develop facility.”¹³

It is the same in design. Even when only slight adjustments are made with each iteration, students are expanding their knowledge and understanding of the building they are trying to create. Through every iteration of each of the several projects done in school, students are learning to learn through the process.

¹² Sami Rintala and Philip Tidwell, “Site Situated,” in *Vorkurs: Making*, ed. Elizabeth Cronin and Zachary Wignall (Gainesville, University of Florida School of Architecture, 2017), 68.

¹³ Charlie Hailey and Nina Hofer, “Methods, Research, Identity: Memos,” in *Vorkurs: Making*, ed. Elizabeth Cronin and Zachary Wignall (Gainesville, University of Florida School of Architecture, 2017), 129.

Design/Build

The framework of the design process – making, thinking, and speaking – has been challenged by Professors Donna Cohen and Charlie Hailey’s Spring 2018 Design/Build Studio. Although this type of studio is greatly different from Architectural Design One through Seven at the University of Florida, students of architecture have been prepped for exactly this type of study. Making, thinking, and speaking have remained the backbones of the process, but have been pushed and challenged further by consensus design and a strong emphasis and dependence on materials.

In this studio, students are working with The Repurpose Project to create a mobile makerspace. The Repurpose Project (the client) wanted a space within which they can store tools, teach workshops, and perform puppet shows. This “Trash Castle” will be a platform for them to travel, advertise, and host events.

The two Professors and Graduate Teaching Assistant facilitated fourteen students as they worked and continue to work toward consensus design. Consensus design is favorable because “unanimity helps keep everyone engaged throughout the entire process.”¹⁴ Each is invested because they feel that they are actively playing a part in the design and creation of this project. It is, however, very difficult. Not only are fourteen people trying to combine fourteen different ideas, but oftentimes they are unclear what their peers are talking about. This is a huge moment where the processes of thinking, making, and speaking are challenged.

Having done research about makerspaces and reflecting on the prompts given by the client, the class dove into small group design charrettes. Students quickly learned that pantomiming is an inefficient way to convey ideas. The thoughts that people were speaking and

¹⁴ Charlie Hailey, *Design/Build with Jersey Devil: A Handbook for Education and Practice*, (New York: Princeton Architectural Press, 2016), 65.

miming with their hands were imagined in different ways by each person. Only when it was drawn onto paper and re-explained did they begin to understand. The combination of verbal and visual language that has been used extensively in past design studios proved to be crucial to the success of consensus design. After three hours of debating, each group drew their ideas in plan and section to find that everyone had been talking about the same thing. Even these quick, thirty-minute charrettes stressed the necessity of competence in thinking, making, and speaking.

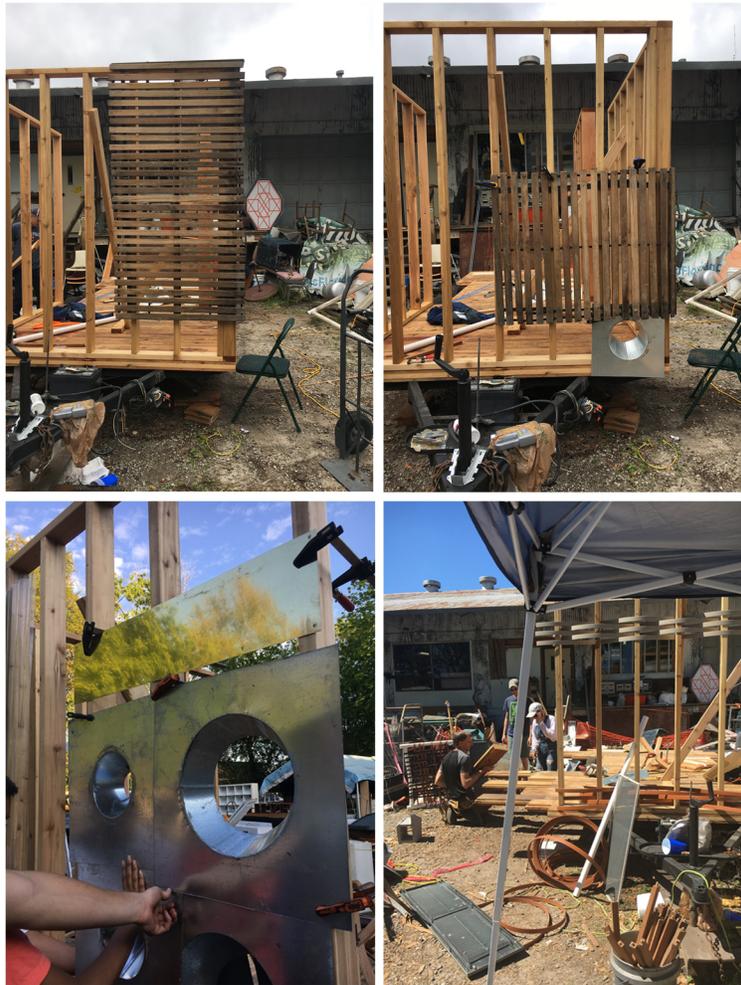


Figure 3: Wall Mock Ups, Architectural Design Eight, Donna Cohen and Charlie Hailey

Now that the preliminary designs are done and building is well underway, these backbones of the design process are used every day as students strive for consensus design in

every aspect of the project – from framework to cladding to roof. Thinking through every facet of the design, students make and discuss. Drawings are made on scrap pieces of wood and materials are clamped onto stud walls (Figure 6), and this visualization leads to discussions about what does and does not work.

Design/Build has also been heavily focused on materials and letting them act as guides and motivators for the project. The representative materials that students are accustomed to can no longer be used at a 1:1 scale. Students can no longer rely on Photoshop to copy and paste materials on all-white material renders. They are now challenged to fully engage the materials and test them, to see what can and cannot be accomplished with them. Additionally, in this particular studio, they are encouraged by the mission of The Repurpose Project to use materials in new and innovative ways. This saves resources from the landfill and reuses them for art and education.

In this project, studying the materials available has been a constant springboard for design. Up to this point in academia, students have used representative materials such as paper, wood, and plexiglass to bring projects into the physical world. These materials have taught them to understand basic concepts about materials within small scale models - structure is needed to make things stand, not everything can bend or fold in the same way, putting two different materials next to each other begs the question of how things will be physically joined. However, these representative materials are limited because they will never have the same characteristics as the actual materials used to construct the building at full scale. Wooden basswood planes do not act like nor have the weight of concrete. Wooden linears will not bear a load like a tube steel frame. Paper does not have the measure and rhythm of a cedar tongue-and-groove floor.

Professors Lisa Huang and Bradley Walters observe that “many design students operate in a space where material reality exists as a remote horizon. In order to straddle this distance, it is critical to engage matter hands-on to know its characteristics (weight, dimensions, limitations) and its relationship to other materials (joints, intersections, adjacencies).”¹⁵ Design/Build studio has been the method through which students are striving to straddle that distance.

After the first few weeks of the semester, the class found themselves having a hard time moving forward with the design. Up to that point, they had been using drawing as their only medium of making. Professor Cohen and the Graduate Teaching Assistant, Elizabeth Cronin, encouraged students to go to The Repurpose Project, gather materials, and begin to make (Figure 7). Touching the materials and attempting to join them together forced them to consider the reality of the trailer, which pushed them further with the project. Making material joints and modules helped them to see the trailer in physical space and they quickly found themselves with a design that they were excited to share with the client.

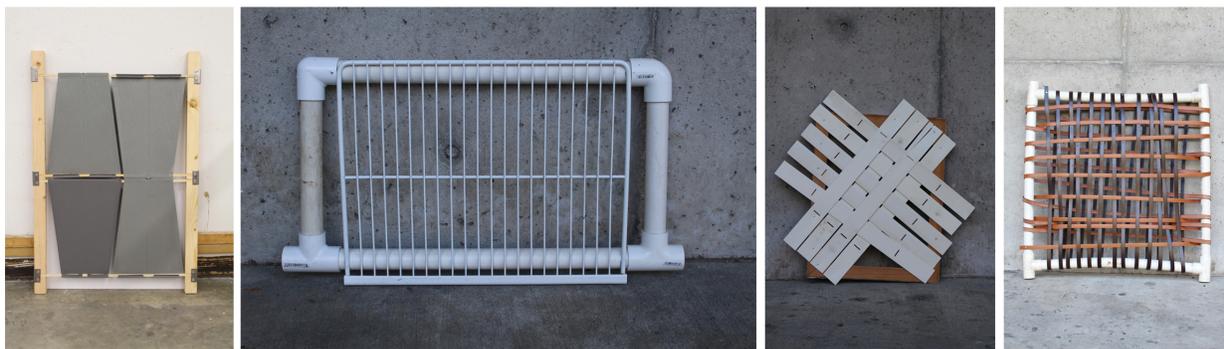


Figure 4: Material Studies, Architectural Design Eight, Critics: Donna Cohen and Charlie Hailey, Photos by Ana McIntosh

Engaging the material in this way was integral to the design process and the students discovered what Professors Huang and Walters expressed to be true: “By working directly with

¹⁵ Lisa Huang and Bradley Walters, “Oculata Manus,” in *Vorkuers: Making*, ed. Elizabeth Cronin and Zachary Wignall (Gainesville: University of Florida School of Architecture, 2017), 36.

materials ... early in the design process, their later building proposals embody a material awareness and sophistication.”¹⁶ Materials were engaged before the design was done, and it altered the way that the project was envisioned. It pushed the project into a new realm of design because students were suddenly aware of its material reality.

As building continues, the available materials help students to discover new possibilities. Stud walls underwent a transformation because of a simple constraint from the materials. The students wanted to use round skylights as part of the skinning system but realized that they wouldn't fit in the twelve-inches on-center studs, so they adjusted to sixteen-inches on-center. This is a small, but real, example of how materials have guided the process of design.

Additionally, Design/Build has heightened students' awareness and understanding of space and scale. When spaces are built at full scale, students have the opportunity to walk through them. Through this experience, they are able to judge whether or not they were successful in creating the atmosphere they had envisioned. In other design studios, students have built small, scaled physical or digital models. Photographs or renderings are used to show that they have created the type of space that they intended. However, small, physical models and Photoshopped images cannot truly convey the reality of what a space might feel like. In his article “Learning and Unlearning,” Juhani Pallasmaa writes, “in experiencing and making architecture, the most important sense is not vision, as educational practices normally assume, but our existential sense, through which we encounter, confront and internalize places and settings as embodied existential experiences. We think with our bodies, muscles, and intestines as much as with our brain cells.”¹⁷

¹⁶ Lisa Huang and Bradley Walters, “Oculata Manus,” in *Vorkuers: Making*, ed. Elizabeth Cronin and Zachary Wignall (Gainesville: University of Florida School of Architecture, 2017), 41.

¹⁷ Juhani Pallasmaa, “Learning and Unlearning,” in *Vorkurs: Making*, ed. Elizabeth Cronin and Zachary Wignall (Gainesville: University of Florida School of Architecture, 2017), 97.

Architects strive to bring specific types of spaces into the physical world, so it is imperative that students learn how to actually build those types of spaces. When they can walk through the spaces, they begin to better understand what physical things (walls, roof, materials) cause a space to feel the way that it does.



Figure 5: Angle Mock Up, Architectural Design Eight, Critics: Donna Cohen and Charlie Hailey

Building at full scale also reinforces the issue of scale. Students can better see how alterations in height or width affect the space, as well as how the interaction of different sized skin materials affects the way that people read the building as a whole. For example, in the original design, the class used an angled wall to create an outdoor patio as well as a focused puppeteer stage. In the scaled model, an angle was measured out and, with the help of a scale-figure, it was decided that the placement of the wall provided ample space for both patio and stage. However, once the floor of the trailer was built, the students found that the three feet that had been allocated for the puppeteer was not nearly enough. Using tape to mock up different angles, they were able to move within both spaces and find the angle that worked best (Figure 8).

Building this project at full scale has emphasized the importance of thinking with the whole bodies, not just with eyes and hands. Immersing oneself within the spaces and within the materials brings what has been learned in previous design studios literally to life. Design/Build has been a stepping stone to a fuller understanding of what architects do.

Conclusion

As aspiring designers, students at the University of Florida School of Architecture are challenged to bring to life what is in their minds. They are given the tools of the design process: thinking, making, and speaking. Led by their curiosity, they push projects forwards and, in turn, let previous projects push them forward. Design/Build is a studio that all of these students should take to reinforce the design process that they have learned. Striving for consensus design and engaging materials challenges the process that they are familiar with and pushes it to new levels. Having learned how to think, make, and speak through a project, students are ready for the challenge of building at a 1:1 scale.

Think, make, speak. Repeat.

Through the series of projects given at the University of Florida School of Architecture, students are given these components of the design process. They are taught to learn through the learning. These tools empower them to bring to life the worlds that they envision in their minds.

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