



**SCHOOLS
OF THOUGHT**

Rethinking
Architectural
Pedagogy

March 5th – 7th, 2020
The University of Oklahoma

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LAND ACKNOWLEDGEMENT

Long before the University of Oklahoma was established, the land on which the University now resides was the traditional home of the “Hasinai” Caddo Nation and “Kitikiti’sh” Wichita & Affiliated Tribes.

We acknowledge this territory once also served as a hunting ground, trade exchange point, and migration route for the Apache, Comanche, Kiowa and Osage nations.

Today, 39 tribal nations dwell in the state of Oklahoma as a result of settler and colonial policies that were designed to assimilate Native people.

The University of Oklahoma recognizes the historical connection our university has with its indigenous community. We acknowledge, honor and respect the diverse Indigenous peoples connected to this land. We fully recognize, support and advocate for the sovereign rights of all of Oklahoma’s 39 tribal nations. This acknowledgement is aligned with our university’s core value of creating a diverse and inclusive community. It is an institutional responsibility to recognize and acknowledge the people, culture and history that make up our entire OU Community.

SCHOOLS OF THOUGHT

The idea for the Schools of Thought conference grew out of research into our own history of pedagogy here at the University of Oklahoma (OU). In the postwar era, faculty at OU developed a truly original approach to teaching design known as the American School. Students were taught to begin with the natural context: the slope of the land, the quality of light, and the local materials. They were instructed to earnestly respond to the program and sincerely listen to the needs and desires of each client. Most importantly, students were taught to trust their own creative instincts and avoid imitation of all kinds. Their work was hard to define stylistically but united by a commitment to resourcefulness, experimental form, and respect for context.

Today, we find aspects of the American School approach resurfacing in architectural pedagogy and practice. Designers are again considering how to be materially resourceful, design sustainably, and work sincerely with clients and sites.

More than 70 years after Goff's arrival at OU, the "Schools of Thought" symposium sought to extend the American School tradition of reconsidering how and what we teach our students.

CONFERENCE ORGANIZERS

Dr. Angela Person is director of research initiatives and strategic planning for the Christopher C. Gibbs College of Architecture at the University of Oklahoma and lecturer in the OU Department of Geography and Environmental Sustainability. In her role as director of research, she supports the Gibbs College in leveraging its resources to drive development of thoughtful, sustainable and experiential solutions to the design problems of the future.

Prof. Anthony J. Cricchio joined the faculty at the College of Architecture at the University of Oklahoma as an assistant professor in the fall of 2008. Professor Cricchio holds a Bachelor of Science degree in architecture (1993) and a Master of Architecture (1995) from the University of Texas at Arlington. He has practiced in the Dallas/Fort Worth area with Corgan Associates. Cricchio believes that teaching architecture is an extension of his own inquisitive nature and is evident in his pedagogical approach to the design studio.

View the full conference program online at: <https://architecture.ou.edu/schools-of-thought/>

THE AMERICAN SCHOOL PROJECT

“A new school, probably the only indigenous one in the United States” is how the architect Donald MacDonald once characterized the school of architecture that developed under the guidance of Bruce Goff and Herb Greene at the University of Oklahoma in the 1950s and '60s. At the time, architecture schools in the United States followed a curriculum inspired by either the French Beaux Arts school or the German Bauhaus school. On one hand, the French model centered on studies of classical principles of design and entailed meticulous copying of the great classical architecture of Greece and Rome. On the other hand, schools such as the Illinois Institute of Technology and the Harvard Graduate School of Design adapted the Bauhaus curriculum model—known for embracing industry and abstraction in art, architecture and design—to the American context. Only the curricular experiment started by Goff at the University of Oklahoma stood apart from these two trends: it was an original and authentically American approach to architecture and pedagogy.

The work of The American School architects is contextual in its relationship to site and climate, resourceful in terms of both typical and unusual materials, and always experimental. The work of architects associated with The American School has been recognized around the world for its originality, organic forms and poetic connection to landscape. The Bavinger House designed by Bruce Goff, for example, was a spiraling form built from local stone, slag glass, and industrial cables. Inside, hanging pods encased in netting formed rooms and water features and planters eroded the distinction between inside and out. It was a home without precedent either in the history books or among Goff's contemporaries. Today, the School of Architecture at the University of Oklahoma continues to foster individual creativity rather than copying the latest styles imported from the coasts or abroad. We do not preach a style no matter how trendy. In order to maintain a creative and open-minded culture, we recruit a diverse body of faculty with individual approaches of their own to OU. Most importantly the work of our faculty and students alike remains grounded in experimentation, resourcefulness, and context. We invite you to join us as we consider the future of design pedagogy in the spirit of these American School “renegades.”

Tour the online interactive American School exhibition, “Renegades,” here:
<https://gibbs.oucreate.com/renegadesonline/>

SESSION CHAIRS

Dr. Mary Anne Akers is currently dean and professor at the School of Architecture and Planning at Morgan State University. She has authored and co-authored several national and international publications and works as a reviewer for renowned professional journals.

Hans E. Butzer, AIA, AK NW, LEED AP, is dean of the Christopher C. Gibbs College of Architecture at the University of Oklahoma. He designed one of the most iconic public places created in his generation in OKC: the Oklahoma City National Memorial. He then followed that up with other landmark projects, like the exquisite Oklahoma City Skydance Bridge. Butzer's fingerprints are all over the transformation that has occurred in Oklahoma City in the early 21st century. He has embedded himself in public boards and commissions and on committees that have charted a vision for the metropolis.

Christian Dagg, AIA, is head of the School of Architecture, Planning and Landscape Architecture at Auburn University. Dagg has taught at the Boston Architectural Center, Northeastern University, and Auburn University. He is a principal of Hinson + Dagg Architects, a firm recognized with AIA design awards at the local and state level for their attention to typology, materials and innovative response to context. Dagg joined the faculty of Auburn University's School of Architecture, Planning and Landscape Architecture in the fall of 2000.

Dr. Justin M. Ferguson, PhD, AIA, NCARB, is lead strategist for BHDP Architecture. Previously, he served as assistant dean of the College of Architecture and Planning, at Ball State University and executive director of the newly created Center for Civic Design, the College's center for outreach and engagement in Indianapolis as well as across the state of Indiana. An architect and urban designer with over 20 years of professional experience across various project types and scales, Ferguson's professional and academic focus for the past 15 years has been that of public engagement in planning and design.

Dr. Lee Fithian, Ph.D., AIA, AICP, LEED AP, NCARB, is associate professor of architecture at the University of Oklahoma. Fithian's research and teaching efforts focus on the application of biological and ecological models to architectural design. She builds connections between interdisciplinary research and architectural design to conserve and regenerate air and water in urban and suburban environments. Each of her studios carries a strong focus on the technical development and integration of analytical visualizations in order to develop "green" architecture.

Shane Hampton is director of the Institute for Quality Communities at the University of Oklahoma. He is a city planner with experience in downtown planning, tactical urbanism, urban design, and community engagement for urban and rural communities. He has served as executive director of the University of Oklahoma Institute for Quality Communities since 2015. Through the IQC, he collaborates with community leaders in Oklahoma and leads teams of OU faculty and students to address built environment challenges in Oklahoma towns and cities.

Dr. John C. Harris, Ph.D., AICP, is the director of the OU Center for Peace and Development. He graduated from Florida State University with a doctorate in urban and regional planning as well as a Master of Science with a concentration in urban and regional planning for developing areas. He is the author of many peer-reviewed publications, such as: Harris, J.C., & Little, S. (2019). His professional credentials include American Institute of Certified Planners, APA/AICP, Member of American Institute of Certified Planners, and Member of American Planning Association.

Dr. Harriet Harriss, RIBA, ARB, Assoc. AIA, Ph.D., PFHEA, FRSA, is the dean of architecture at Pratt Institute. Pioneering new pedagogic models for design education has been at the forefront of her teaching, research, and writing, as well as a focus on the need to broaden participation and diversity in architecture. Dr. Harriss led the MArchD at Oxford Brookes University and has previously taught in the USA at Parsons, The New School and has run international collaborations with New York Institute of Technology, Columbia University, and the University of Detroit, Mercy.

Dr. Winifred Elysse Newman, Ph.D., is a professor and director of the Institute for Intelligent Materials, Systems and Environments at Clemson University. Dr. Newman concentrates on spatial perception in architecture, ecological psychology, and neuroaesthetics with active research in data visualization, mapping, STEM learning environments, and histories of technology and science. Dr. Newman was a Fellow at the Max Planck Institute for the History of Science in Berlin with additional fellowships from the Harvard Faculty of Arts and Sciences.

Dr. Stephanie Z. Pilat, Ph.D., FAAR '07, Associate AIA, is a designer and architectural historian whose teaching and research examines points of intersection between politics and architecture. Pilat is a professor and director of the Division of Architecture at the University of Oklahoma.

Dr. Carmina Sánchez-Del-Valle is a professor in the Department of Architecture at Hampton University. Professor Sánchez is a licensed architect registered in Puerto Rico and has worked on developing models for mapping historical districts as graphic relational databases.

Joana Dos Santos (she/her/hers) is chief diversity, equity and inclusion officer at Taubman College of Architecture and Urban Planning at the University of Michigan. Dos Santos started her 15-year career as a community organizer who fought for comprehensive immigration reform, organizing and facilitating peaceful demonstrations in Washington, D.C. and Massachusetts.

THE CHRISTOPHER C. GIBBS COLLEGE OF ARCHITECTURE

The Christopher C. Gibbs College of Architecture, whose oldest program was established in 1916, supports a future in which all communities are designed for resiliency and empowered to maximize their social, economic and environmental well-being. The Gibbs College of Architecture educates more than 600 students through undergraduate, master's, and doctoral programs across seven academic units in Architecture, Construction Science, Environmental Design, Interior Design, Landscape Architecture, Urban Design and Regional and City Planning.

THE UNIVERSITY OF OKLAHOMA

Established in 1890, the University of Oklahoma is a doctoral degree-granting university and leader in research, health care, and academic activity impacting the state of Oklahoma and global community. The Norman campus enrolls more than 28,000 undergraduate and graduate students, the Health Sciences Center in Oklahoma City enrolls more than 3,000 students and the OU-Tulsa campus enrolls more than 1,000. Of the 4,385 incoming freshmen in 2018, the average ACT score is 26.2 and is one of the most diverse and inclusive groups of incoming students in university history. OU began a new focus in 2018 to double research efforts in the next five years, promote OU Medicine as the health care provider of choice in the State of Oklahoma, and grow the university in northeastern Oklahoma.

CONFERENCE SPONSORS

The "Schools of Thought" conference was made possible with support from:

Christopher C. Gibbs College of Architecture, University of Oklahoma
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Bruce Goff Chair of Creative Architecture
Fred Jones Jr. Museum of Art
Alfred Taubman College of Architecture and Urban Planning, University of Michigan
Ben Graves
The Gunning Family

SESSION: Keynote Lectures

Thinking about Schools: American Experiences and Experiments

Prof. Joan Ockman

Prior to becoming a full-time member of the faculty at the University of Pennsylvania Stuart Weitzman School of Design, Joan Ockman taught at Columbia University's Graduate School of Architecture, Planning and Preservation for over two decades and served as director of Columbia's Temple Hoyne Buell Center for the Study of American Architecture from 1994 to 2008. She was honored by the American Institute of Architects for collaborative achievement and named a Fellow of the Society of Architectural Historians in 2017.

View Prof. Ockman's keynote lecture online here: <https://youtu.be/7OBCMqFDaV4>

A Pedagogy for Working Collaboratively

Dr. Sharon E. Sutton, FAIA

Sharon Sutton is an activist, educator, and public scholar who promotes inclusivity in the cultural makeup of the city-making professions and in the populations they serve. Sutton, who previously practiced architecture in New York City, was the 12th African American woman to be licensed to practice architecture, the first to be promoted to full professor of architecture, the second to be elected a Fellow in the American Institute of Architects (AIA), and the first to be president of the National Architectural Accrediting Board.

View Dr. Sutton's keynote lecture online here: <https://youtu.be/tjffZO4GmKk>

SESSION: Lightning Talks

A number of concise presentations on architectural pedagogies were offered during the conference, spurring thoughtful conversation. Below is a list of papers accepted into the Lightning Talk sessions.

Track 1: Rethinking Curricula

"From the Ground Up: Creating a Culture to Steer Pedagogy at a Large School" (James Michael Tate, Texas A&M University, and Andrew Tripp, Texas A&M University)

"Meta-Context: A Multi-Scalar Contextual Pedagogy for Teaching Design Fundamentals in Architecture" (Elena Rocchi, Arizona State University, and Kristian Kelley, Arizona State University)

"“Radicality” in Architecture—On the Utility of Applied History of Contemporary Architecture in Architectural Design" (Elena Rocchi, Arizona State University)

"Thermal Delight and the Anthropocene" (Alex Timmer, University of Wisconsin – Milwaukee)

"The City as a Board Game: Notes on Working with a Virtual Dimension in the Design Studio" (Kim Helmersen, ETH Zurich)

"The Value of the Novice: Applied Research Through Design-Build" (Emily R. Baker, University of Arkansas)

"Provocation: Architectural Research as a Dialectic Discussion" (Liz Martin-Malikian, Kennesaw State University)

"Snapshot: Is Doing Architecture, Doing Research?" (Liz Martin-Malikian, Kennesaw State University, and Elizabeth Martin, Kennesaw State University)

Track 2: Rethinking the Classroom

"Groundforms: Architectural Constructions of Ground After the Digital" (Zachary Tate Porter, University of Nebraska-Lincoln)

"IMAGE FATIGUE" (Keith Peiffer, Oklahoma State University)

"INTERIOR TOPOGRAPHIES: Towards a New Typology of Spatial Occupancy" (Rana Abudayyeh, The University of Tennessee, Knoxville)

"Local Knowledge: Learning from Landscape Architecture and Deliberative Democracy" (Katie Kingery-Page, Kansas State University)

"Landscape as Political Access to Architecture" (Dragana Zoric, Pratt Institute)

"Naturally Brutal: Landscape as Icon" (Dragana Zoric, Pratt Institute)

"Off the Wall: The Legacy of Architecture Exhibitions" (Ellen Donnelly, University of Nebraska-Lincoln)

"Resourcefulness of Constraints" (Paolo Sanza, Oklahoma State University)

"Sapientia" (Paolo Sanza, Oklahoma State University)

Track 3: Rethinking Media and Methods

"3rd Generation 3D Modeling: The Influence of Highly Curated Interfaces on Design" (Damon Leverett, University of Arizona)

"Revising Form: On a New Definition of Form in Architecture" (Grant Alford, Kansas State University)

"Digital Pedagogy for Architectural History" (Jeffrey Lieber, Texas State University)

"OPEN Platforms: Changes in Architectural Education" (Yoonjee Koh, Boston Architectural College)

"Preparing for the Online Architectural Practice" (Mark Rukamathu, Boston Architectural College)

"Student Perspective: Understanding and Utilizing the Methodology Behind Building Information Modeling in Academia" (Donovan Linsey, University of Oklahoma)

"Critical Cinematic Communications: A Mode of Urban Observation" (Seung Ra, Oklahoma State University, and Sarah Ra, Oklahoma State University)

"Fun Palace Realized" (Michael Su, Pratt Institute)

"Rapid, Responsive Design: SITREP.at Design Studio" (Michael Su, Pratt Institute, and Carla Leitao, Pratt Institute)

Track 4: Rethinking Boundaries

"Teaching Color Now" (Erik Herrmann, Ohio State University)

"The Academy as a Facilitator in Re-Making Architectural Knowledge" (Karen Cordes Spence, Drury University)

"Developing Resources for Design Students" (Karen Cordes Spence, Drury University)

"Student as Site: Inclusive Design Pedagogy" (Emily Wettstein, Harvard University)

"Five Points of Informality" (Ashley Bigham, Ohio State University)

"Dialogic Pedagogy: Talking Ourselves Out of Paternalist Structures" (Suzannah Grasel, Architects Lewis + Whitlock)

"REDEFINING BOUNDARIES: #ThisIsNotAWall" (Ane Gonzalez Lara, Pratt Institute)

"Field" (Ane Gonzalez Lara, Pratt Institute, Mrinalini Aggarwal, Pratt Institute, and Swati Piparsania, Pratt Institute)

"Political Turns: From Spaces of Detention to Spaces of Consumption in Montevideo, Uruguay" (Federico Garcia Lammers, South Dakota State University)

SESSION: Poster Presentations

The following authors were invited to present these posters during the Schools of Thought opening reception.

"Anotherness in Design Education: Studying Across Cultures" (Sarah A. Ra, Oklahoma State University)

"campARCH: Building Blocks" (James Michael Tate, Texas A&M University)

"Comics: A Visual Format for Co-Teaching Design and Writing" (Sacha Frey, Pratt Institute, and Robert Brackett, Pratt Institute)

"Design Thinking Circularity Between Analog and Digital" (Otto (Adulsak) Chanyakorn, Kansas State University)

"Love Stack: Engaging Design-Build Pedagogy" (Jason Scroggin, University of Kentucky)

"Pulp goes Oklahoma" (Roger William Connah, University of Texas at Arlington, and J.P. Maruszczak, University of Texas at Arlington)

"The Kindergarten Hypothesis" (Connor Evan Hopper, University of Oklahoma)

"Urban Cogeneration Pedagogy for Architecture Curriculum" (Samia Kirchner, Morgan State University)

"What Stylus Should We Draw? Notes and Prospects for Digital Tablet-Based Design Drawing" (Grant Alford, Kansas State University)

SESSION: “Equity Is NOT Window Dressing: Breaking Through the Cloud of Equity Rhetoric”

If students are not blank slates and possess relevant— if unrecognized— knowledge, skills, and experiences, how can acknowledging them contribute to shape the space for teaching and learning architectural design? How do we do it now? How well are we doing it? What must be different? This session consisted of several interactive parts where discussion was key. Working in small groups, participants proposed solutions to the above questions to discover how equity might be attained in architectural study

View the full “Equity Is NOT Window Dressing: Breaking Through the Cloud of Equity Rhetoric” interactive session online here: <https://youtu.be/I5EuSLVMLNs>

Session Organizers

Dr. Carmina Sánchez-Del-Valle, Hampton University

Dr. Mary Anne Akers, Morgan State University

Ms. Joana Dos Santos, University of Michigan

Dr. Stephanie Z. Pilat, University of Oklahoma

Session Introduction

DECOLONIZING ARCHITECTURAL PEDAGOGIES

Harriet Harriss, Dean of Architecture, hharriss@pratt.edu
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 Christopher C. Gibbs College of Architecture, The University of Oklahoma, Norman, Oklahoma, USA

Note: You may view a selection of “Decolonizing Architectural Pedagogies” paper presentations online here: <https://youtu.be/9xPnNp23IWE>

Session Papers

- p. 7** “Freedom and the Politics of Space: Contemporary Social Movements and Possibilities for Antiracist, Feminist Practice in U.S. Architecture” (R. Chris Daemmrich, Tulane University)
- p. 21** “The Architecture Curriculum Between Two Revolutions: From the West to the Islamic Curriculum” (Ali Javid, School of Design, UWA, Perth, Western Australia)
- p. 36** "The Stranger in the Architectural Project on the City" (Jared Macken, Oklahoma State University)
- p. 53** "Coalition Building and Discomfort as Pedagogical Strategies" (Olivier Vallerand, Arizona State University)

Not all authors submitted papers for inclusion in the conference proceedings; below are additional papers accepted into this session.

“Indigenous Lessons of Continuity and Connectivity Within the Design Studio” (David Fortin, Laurentian University)

“Repositioning Center: Methods for Shifting the Diversity Discussion to Action” (Kiwana T. McClung, University of Louisiana at Lafayette)

“Intermediate Territories: Latin American Informal Urbanism as Provocation and Pedagogical Turn” (Gregory Marinic, University of Cincinnati, and Pablo Meninato, Temple University)

"In Post-Novis All the Students are the Teacher" (Cruz Garcia, Carnegie Mellon University, and Natalie Frankowski, Carnegie Mellon University)

"Entangled Architectures: Pedagogies of Displacement and Refuge" (Huda Tayob, University of Johannesburg)

FREEDOM AND THE POLITICS OF SPACE: CONTEMPORARY SOCIAL MOVEMENTS AND POSSIBILITIES FOR ANTIRACIST, FEMINIST PRACTICE IN US ARCHITECTURE

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ABSTRACT

Students and practitioners of architecture challenge the hegemonic Whiteness, maleness, cisheteronormativity, and capitalist control of these disciplines as a means of democratizing and decolonizing practice to create conditions for Black self-determination. This paper considers how architectural professionals have responded to contemporary movements for social justice in the United States and the ways in which some are more and some less successful at addressing the intersecting nature of identity-based oppressions.

Organizations and convenings, including the National Organization of Minority Architects (NOMA), Black in Design, the Design Futures Public Interest Design Student Leadership Forum, Equity by Design, and the Architecture Lobby are considered from 2012 to the pre-pandemic spring of 2020, with a focus on the emergence of new spaces and shifts in how existing spaces engage with activist movements as a result of changing political conditions.

The paper provides historical background and constructive critique. It concludes with recommendations for creating institutions that respond proactively, rather than reactively, to racist violence, sexual harassment, assault, and exploitation, and for making lasting meaning of these injustices when they occur. The roles Black people and other people of color, particularly women, *have* played, and the roles White people, particularly men, and White institutions *must* play in creating an antiracist, feminist architecture are a focus of this paper.

Keywords: Activism, Antiracism, Equity, Feminism, Organizations, Protest

1. INTRODUCTION AND POSITIONALITY

Narratives of resistance struggle from slavery to the present share an obsession with the politics of space . . . indeed, Black folks equated freedom with the passage into a life where they would have the right to exercise control over space on their own behalf, where they would imagine, design, and create spaces that would respond to the needs of their lives, their communities, their families. (hooks 1995)

This is not activism, but a form of survival. Design practice must get closer to the unknown, to things that are uncomfortable and create friction. It's about creating spaces worth advocating for. Where memorials, museums, and enriching institutions outweigh prison yards by 100 to 1. Where those ideas about cities, neighborhoods,

and identities we live in are galvanized by the labor of design communities, not design silos. (Henry 2018)

This paper explores how contemporary students and practitioners have exercised control over the spaces of architectural academia and professional practice in response to antiracist, feminist, and anticapitalist movements. It concludes with recommendations for educators, administrators, students, and practitioners seeking to create institutions that respond proactively, rather than reactively, to racist violence, sexual harassment, assault, and exploitation, and to make lasting meaning of these injustices when they occur.

Such exploration requires definitions. **“Race”** is a social construct that artificially divides people into distinct groups based on physical appearance, ancestral heritage, or cultural affiliation. **“Racism”** is the systematic subordination of members of targeted racial groups placed within a hierarchy. In the United States, people of African descent racialized as Black are at the bottom of this hierarchy, along with Indigenous people, Asian Americans, and other non-White people of color occupying intermediary positions below White people. Racism is practiced through the actions of institutional structures, cultural norms, and individuals that reinforce this hierarchy (Wijeyesinghe, Griffin, and Love 1997). **“Antiracist practice”** in the United States context requires thoughtfulness and discipline; the application of cultural relativism; judging people as individuals rather than as representatives of an entire group; rejecting tokenism; and the embrace of feminism and the rejection of homophobia, femmephobia, and transphobia, because Black women, Black trans men and women, Black queer and nonbinary people are all Black people (Kendi 2019, 198–200).

I intend to provide historical background and constructive critique based on my own perceptions, research, and observations for the benefit of architectural educators, administrators, students, and practitioners. From my positionality as a queer gay able-bodied White man with access to generational wealth and American citizenship, raised in a predominantly White neighborhood in a predominantly White US city, one who attended predominantly White schools for most of my academic career, including architecture school, I am particularly interested in the obligations and responsibilities of predominantly White institutions (PWIs). I incorporate histories and analysis of organizations run by and for designers who are Black or other people of color, but my conclusions primarily suggest actions for people who hold wealth, power, and privilege, many—though not all—of whom are racialized as White.

1.1 METHODOLOGY

This paper examines architectural education and practice through the lens of architecture race theory, descended from legal scholarship’s critical race theory, and critical Whiteness studies as applied to architectural education and practice (Lokko 2000, 14–20; Curry 2017; Davis 2019). Activism in education and practice is considered through social movement theory, with media and content analysis methods utilized to compile documentation of recent historical events (Macnamara 2005; Della Porta and Diani 2006).

1.2 AMERICAN ARCHITECTURE AS WHITE SUPREMACIST CAPITALIST PATRIARCHY

The appropriation and use of space are political acts (hooks 1989, 209). As long as people have shaped the environment through built interventions, the designers and builders of

those interventions have sought to create desired political, economic, social, and cultural conditions through the process and product of their work.

If an architectural product, the “use” of space, is an expression of the cultures that produced it, so too is the “appropriation,” the professional processes through which spaces are created for use. Architectural practice in the United States is normatively conceptualized within a “Western tradition” focusing on European powers and their colonial dominions (Wiley 2015). This artificially proscribed past is reinforced in a Euro-American present in which 92 percent of living registered architects are White and 2 percent are Black, 82 percent are men and fewer than 500 are Black women, out of about 110,000 (National Council of Architectural Registration Boards 2018). Enrollment of African American and Latino architecture students hasn’t appreciably increased since 2009 (National Architectural Accrediting Board 2016, 10). Eighty-two percent of architectural educators are White; 3 percent are Black, 6 percent are Asian, 6 percent are Latinx, and less than 1 percent are Native American (Chikako Chang 2014).

I was taught that architects evolved from the “master builders” of medieval European cathedrals, whose work was professionalized by men working in the service of absolutist monarchs, religious leaders, and capitalist imperialists. American architects are taught a pantheon of White supremacist patriarchs (Finley 2019; Lamster 2019, 329–30; López-Durán 2019, 7–10).

These histories are the foundations of White US settler colonialist city making. In a country built on the genocide of Indigenous people with wealth created by the unpaid labor of Black people, traditional architectural practice is a tool for the erasure and reproduction of these traumas. Designers seeking to deconstruct domination through their work will find no precedent in dominant practice.

1.3 “ARCHITECTS AND URBAN DESIGNERS: HOODIES UP!”

Like the direct-action campaigns that challenged anti-Black policies during Reconstruction in the 1860s and Jim Crow in the 1950s, the movement known as “Black Lives Matter” arose after a specific act of anti-Black physical violence and an insufficient state response. On the night of February 26, 2012, seventeen-year-old Trayvon Martin walked to a convenience store in Sanford, Florida. George Zimmerman’s decisions to profile, follow, and murder Martin initially did not raise enough concern for police to detain Zimmerman. In the days and weeks that followed, outrage, disgust, and sadness about the incident spread nationally.

In an article concluding with the words of this section’s title, the urban designer Mitch McEwen (2012) implored architects to see Martin’s murder as “a lever in American history, like the death of Emmitt Till—a pivotal moment when irreconcilable narratives of this country collide.” Zimmerman was acquitted in July 2013. The activist Alicia Garza’s “A Love Letter to Black People,” posted on Facebook and shared by Opal Tometi and Patrisse Khan Cullors, originated the phrase “#BlackLivesMatter” on July 13. Within days, it appeared on signs at protests around the nation (Chase 2018, 1091).

On August 9, 2014, eighteen-year-old Michael Brown was murdered by Officer Darren Wilson in Ferguson, Missouri. Protests drew significant attention on social and traditional media, particularly after a militarized police response. Local and national organizers converged on the city, building a national network by the time of Wilson’s nonindictment in November (Lowery 2016, 65).

1.4 #SAYHERNAME, #BLACKTRANSLIVESMATTER

Protests after the death of Sandra Bland in Waller County, Texas, on July 13, 2015, led to increased visibility of organizing under the hashtag #SayHerName, highlighting the toll of police brutality and murder on Black women and girls whose deaths receive minimal attention (Khaleeli 2016). Activists seeking justice for Black trans women raise awareness of their unique vulnerabilities with the hashtag #BlackTransLivesMatter:

Black Lives Matter is a unique contribution that goes beyond extrajudicial killings of Black people by police and vigilantes. It goes beyond the narrow nationalism that can be prevalent within some Black communities, which merely call on Black people to love Black, live Black and buy Black, keeping straight cis Black men in the front of the movement while our sisters, queer and **trans** and **disabled** folk take up roles in the background or not at all. Black Lives Matter affirms the lives of Black queer and trans folks, disabled folks, **Black undocumented folks**, folks with **records**, **women** and **all Black lives** along the gender spectrum. It centers those that have been marginalized within Black liberation movements. It is a tactic to (re)build the Black liberation movement. (St. Clair 2016)

How did architectural students and practitioners respond to this movement and others in the 2010s? Where do designers succeed in applying its intersectional analysis to address the needs of the most marginalized (Hill Collins 1990, 221–38)? Where do we fail to comprehend overlapping positionalities?

1.5 RISE: NOMA 2015 AND THE FIRST BLACK IN DESIGN

Scholars of social movements trace their life cycles through four stages: emergence, coalescence, bureaucratization, and decline (Christiansen 2009). This section considers these events as the context against which two groups planned gatherings held in October 2015 around which emergent activism in architecture coalesced.

NOMA's Louisiana chapter hosted its 2015 national conference in New Orleans, where awareness of design's political nature had spread in the decade since the Katrina disaster. "RISE: Social Justice by Design" hosted sessions such as "Design as Protest"; "The People as Genus Loci: Counter-Gentrification Tactics after the Storm"; and "The Political Is Personal: The Role of the Designer at the Intersection of Social Justice and Design" (NOMA Louisiana 2015). One attendee reflected:

If our claims of high performance and accountability are to continue to have relevance and adaptive value, the collective experience and perspective of our workforce must reflect the users of our designs. When we, the collective design workplace, include social justice as a business practice, we not only enhance opportunities for minority talent, we engage a wider potential for pioneering socially just environments. (Dickinson 2015)

The African American Student Union (AASU) at the Harvard Graduate School of Design in Boston began planning what became Black in Design (BID) in the fall of 2014 (Mock 2017). The AASU had invited the rapper Kanye West to visit and speak informally at

the school, an invitation West accepted in November 2013, five months after Zimmerman’s acquittal. Students used the subsequent media attention to shine a light on the underrepresentation of Black designers at their school and in the field. AASU’s Tessa Kaneene said:

We’re both African-Americans who have had a lot of successes that we hope others can have; we can be ambassadors for those that might not be able to be sitting at the table right now. We’d love to start a conversation about the fact that we have a school of several hundred people and we have an African-American student union of 20. Why are there fewer than 30 African-Americans in a school of 700? What does that say? (Vozick-Levinson 2013)

During the 2014 and 2015 academic years, protests responding to the murders of Brown, Bland, Tamir Rice, Eric Garner, and others coincided with harassment, threats, and graffiti targeting Black students on college campuses (Trachtenberg 2018). Students’ responses echoed 1960s activism, highlighting a chronic lack of racial transformation in American higher education (Smith and Thrasher 2015).

AASU’s April 2015 conference on race and urban design was organized as protesters sought justice for Freddie Gray in Baltimore. AASU president Dana McKinney said, “We don’t have courses on justice and race . . . It’s the first time these issues have really been put forth” (El-Nasser 2015). Observations from this event informed the planning of Black in Design, a two-day gathering held October 9–10, 2015 (Mock 2017).

Speakers included students, professors, and practitioners; researchers, activists, and artists representing a wide range of fields, ages, and depths of experience. Thirteen percent were White—inverting the demographics of the 13 percent Black US population (Black in Design 2015; US Census Bureau 2019). Student organizers Cara Michell and Courtney Sharpe spoke on the conference’s origins:

Michell: “Because of the events in Ferguson and Baltimore that made national news last year . . . [which] are unfortunately not uncommon, we felt that it was imperative to make a new contribution to this conversation, and to use our training as designers to convene a conversation about how to intervene in these cycles of injustice. We are particularly grateful to everyone who organized, protested, and acted to raise consciousness to bring the conversation about social injustice today to the forefront of the national discourse.”

Sharpe: “Here at the GSD the [AASU] participated in marches, we went to vigils, and we participated in [the] Map the Gap mapping project . . . we created an installation to honor the lives that were lost to police brutality, and we thought it was really important that we make a memorial to that.” (Michell and Sharpe 2015)

1.6 BID SATELLITE AND DESIGN FUTURES

The White architectural theorist K. Michael Hays spoke at Black in Design 2015 about the White spatial imaginary, which “produces the kind of defensive localism that dominates decisions about public interventions and how services are distributed, and . . . privatism which sometimes turns hostile” and the “radicalized place Black Americans live in, which

has compelled them to develop . . . a spatial imaginary of congregation” (Hays 2015). Hays could be describing the 2016 Republican presidential primary campaign during which students organized a satellite Black in Design in Baton Rouge, Louisiana, affirming Black presence at a public PWI without the resources or spotlight of the GSD (Louisiana State University College of Art and Design 2016; Dasjon Jordan, personal communication with the author, 2020).

Another conference, in the predominantly White field of public interest design (PID), joined Black activist design practices with allies in the community design movement. The initial Design Futures PID Student Leadership Forum aimed “to capture the growing movement of people interested in how design might better address the wicked problems facing our globe” (Design Futures 2013).

The fourth annual Forum was the first to dedicate an entire day of its program to discussions of race and identity (Haynes 2016). Sessions covered community organizing, community engagement, and other forms of democratized design and planning, and speakers led participatory workshops. Student “open mics,” panels of community experts, and other participatory methods put the conference planners’ pedagogy into practice (Design Futures 2016b). The shift from “[better addressing] wicked problems” in 2013 to “helping students better understand challenges of racial inequality that inform their work” in 2016 can be read as a reflection of a maturing endeavor and a barometer of the political climate (Design Futures 2016a).

1.7 EQUITY BY DESIGN

Equity by Design (EQxD)’s advocacy illustrates continuing disparities between representation of White men, Black women and other women of color, and White women in architecture (Pitts et al. 2015). The evolution of the Missing 32% Project into EQxD represents the success of organizers who used the AIA as a platform to spread their message (Equity by Design 2020). Resolution 15-1, adopted at the June 2015 conference in Atlanta while protesters sought justice for Freddie Gray in Baltimore, asked the AIA to develop an ongoing program to “assess data, track progress, set a plan of action, and report on results.” Co-author Rosa Sheng said:

Until the architecture profession reflects the demographics which it serves, we will not have reached our fullest potential for impact, meaning and influence . . . It’s not just for women’s sake, but also for talent retention to sustain the profession and connect with the diverse population that we serve. (Testado 2015)

EQxD’s annual symposium in San Francisco brings together practitioners and leaders across architecture, planning, and landscape architecture. The 2018 symposium was structured around panels on “Voices,” “Values,” and “Vision,” and featured members of Architexx, NOMA, and the Architecture Lobby (Equity by Design 2018). Eighty-four percent of the speakers identified as female or nonbinary, inverting representation in an 81% male profession (National Council of Architectural Registration Boards 2018).

1.8 #METOO AND SHITTY ARCHITECTURE MEN

#MeToo was originated in 2006 by Tarana Burke, a Black woman activist and survivor of sexual assault who encouraged women to share their experiences in solidarity with one another through social media (Harris 2018). The movement went viral during the early Trump presidency (*Chicago Tribune* 2020). The writer Moira Donegan anonymously created an online “Shitty Media Men” list to which sexual harassment and assault could be anonymously reported (Friedersdorf 2018). Women and men in architecture who had experienced sexual harassment and assault began to discuss their experiences on a “Shitty Architecture Men” (SAM) list made public in March 2018, the week after five women accused Richard Meier of sexual harassment (Pogrebin 2018). SAM’s anonymous creator said,

There’s this idea that architecture is a magical, important contribution to the world that is undervalued. We’re trained to view suffering as deeply related to the work . . . Harassment is easy to dismiss as part of the sacrifice. And even when it’s absolutely wrenching and not easy to dismiss, the culture of genius in architecture remains. Many firms are structured around a “Great Man” with a singular vision, which lowly employees are tasked with carrying out. It’s very top-down. This can create power imbalances that make junior employees vulnerable to exploitation, whether it’s harassment, pay inequality, or something else. (Labarre 2018)

At the 2018 AIA conference Voices of Plurality, a one-hundred-member flash mob protest, organized by a racially and age-diverse group, gathered to read a collaborative manifesto declaring “This is what a feminist looks like.” Pascale Sablan, NOMA’s official historian, said:

In 1968, when Whitney M. Young . . . gave that speech it really resonated. And what’s scary to us is that we haven’t seen much progress, if at all. We really need to be vocal and understand that we don’t have to wait for these prolific heroes and leaders to come in and make changes. Each of us have a voice and those voices are valid. (Keane 2018)

At a Think-In organized by the Architecture Lobby (TAL), the feminist architectural historian Andrea Merrett said,

The big lesson from [the 1960s and ’70s] is the change that happened then was in parallel with the larger women’s movement. Women in architecture really capitalized on that moment to make progress in the profession. We’re in another [similar] moment. We’re not going to fix this all on this run, but while we have the momentum, now is the time to do as much as we can.

As the AIA Code of Ethics was updated to explicitly prohibit sexual abuse and harassment, many remained frustrated with the AIA’s strategy of affirming and incentivizing good behavior rather than investigating, penalizing, or facilitating the reporting of bad behavior. The AIA’s ability to force action or change was questioned by the Architecture Lobby (Budds 2019).

1.9 THE ARCHITECTURE LOBBY

Founded in 2013 at Yale University, the Architecture Lobby (TAL) brought the anticapitalist critique of the Occupy movement into the architectural profession. Focused on labor issues and active in feminist organizing, the group has more than a dozen chapters in the United States, Australia, and the UK (Medina 2017; Petrunia 2021). Organizers challenge the AIA from the left on its response to the election of President Trump, to #MeToo, and to architects' roles in the construction of prisons and immigrant concentration camps (Franklin 2019).

TAL's statements have explicitly called out and declared its opposition to White supremacy (Franklin 2020). Activist designers outside the organization, however, note the organization's position within a White and privileged profession, demanding that its actions align with its words (Lena [@lenapalestina] 2020).

A 2017 pamphlet considers that "there is a fine line between normalizing diversity and promoting tokenization . . . tokenization is not a substitute for genuine diversity and inclusion . . . direct action must be taken," and questions emphasizing the value proposition of diversity and inclusion, noting that such rhetoric dehumanizes marginalized groups by associating their validity with their economic productivity (Deamer, Dunn, and Shvartzberg Carrió 2017).

2. CONCLUSIONS AND FUTURE WORK

This paper is directed primarily at educators, leaders, and administrators of institutions and organizations. It catalogues students' and professionals' demands for change in the face of violence and trauma. In periods of protest, such demands have occasionally been met with action from institutions and organizations. More often these institutions wait until the next time protesters demand action. This cycle must be disrupted, and here I propose interventions to do so.

The status quo benefits people who run architectural institutions of White male privilege and power. Only when protest movements outside the profession become too difficult to ignore do they take action, and when students and professionals organize, they may not know the histories of those who have organized before them. Knowing these histories could help them avoid past mistakes and build power with activists of older generations. **Educators must teach histories of protest and social movements as factors shaping the built environment and the city-making professions.**

Antiracist movements led by Black people and other people of color outside the professions spread into the professions first through Black people and other people of color who fight for their positions as students, faculty, interns, and associates. Though they may begin with questions of representation, these activists recognize that diversity is no substitute for justice. They know the difference between descriptive and substantive representation: do they look like me, or are they actually creating policy, shaping power, or creating cities in my interest? (Guinier 1994, 41–71). **Students and practitioners must demand substantive representation of Black, feminist, queer interests.**

White people must not act as saviors, especially when we represent institutions of White wealth, power, and privilege interested in change. We must collaborate and cooperate with people who substantively and descriptively represent marginalized identities. We must practice stepping back, stepping out, listening, and the simple but powerful act of not talking. We must seek out and use resources, like antiracism workshops run by professional

educators. Antiracism and feminism are practices, like running or weightlifting; we get better at them when we make an effort to do so. **Students, educators, and practitioners must actively seek out and use resources for antiracist, feminist education. We must change norms of professional practice to create antiracist, feminist schools and workplaces.**

When we recognize the intersecting nature of oppressions, we also see that identities are plural, and that just and equitable design requires considering the most marginalized first. Black lives matter; Black women's lives matter; poor Black women's lives matter; poor Black queer and trans women's lives matter. We are not "designing cities for everyone" until we are actively designing with—not "for"—the most vulnerable members of our society (Brown-Wilson 2018, 169–75) **Students and practitioners must design with the margins.**

What do Black, feminist, queer cities look like? What does an antiracist Green New Deal look like? Ivy League students are not the only ones asking, but they are able to leverage media visibility, institutional wealth, and connections. Faculty advisors and strong alumni networks are especially important to student organizers because of their temporary and transient presence on campuses (Association of Collegiate Schools of Architecture 2019). PWIs must recognize such support as a responsibility to their students and faculty and the world in which they are preparing their students to work. **Educational leaders, particularly at PWIs, must hire and retain Black faculty and other faculty of color, particularly women and queer people, and Black students and other students of color, particularly women and queer people, and provide financial and staff support for student organizations, and funding and encouragement of student and faculty-directed projects like the conferences and symposia described in this essay.**

Historically Black colleges and universities (HBCUs) have always excelled at training Black architects (Dozier 1976, 162–68). Rather than encouraging investment in these programs, however, White architectural institutions with the privilege and power to object have allowed them to be defunded or destroyed (Southern University and Agricultural and Mechanical College 2013). **The AIA, NCARB, and PWIs must support HBCU architectural institutions and other minority-serving institutions on these institutions' terms.**

All architectural workers must have more control over their labor conditions, including the projects on which they work, and the ability to withhold their labor from projects and clients who advance White supremacy, patriarchy, homophobia, transphobia, and imperialism. **White, male, straight architectural labor activists must affirmatively further antiracist, feminist, and queer city making in coalition with architectural workers already organizing in spaces that are predominantly Black or of other people of color.**

Racial capitalist violence and trauma will continue to precipitate cycles of activist energy (Kelley 2017). Leaders must use their own and their institutions' power, privilege, and wealth to meet activist demands between, not just during, periods of protest. If this is not activism, but a form of survival, we cannot discourage demands for justice when the people in power deem such demands inconvenient or ill-timed. We must take addressing the harm caused by White supremacy, cisheteropatriarchy, and capitalism as seriously as we take energy consumption, detailing, and style.

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THE ARCHITECTURE CURRICULUM BETWEEN TWO REVOLUTIONS: FROM THE WEST TO THE ISLAMIC CURRICULUM

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ABSTRACT

The architectural curriculum in Iran has been changed five times in the last five decades (1963–2017). In each period, efforts to change the content and structure of the curriculum were based on the architectural profession's vision with regard to sociopolitical and economic issues, such as the agenda of development in the White Revolution and Islamizing the society after the 1979 Islamic Revolution. The curriculum as a sociopolitical artifact can be defined as a systematic set of relations between people, objects, events, and circumstances that is changed and developed based on the sociopolitical agenda. This paper focuses on crucial moments in the transformation of architectural education between the two contemporary revolutions in Iran, the White Revolution and the Islamic Revolution. The story of the transformation of the curriculum began in 1963 when a new system of architectural education, Italian pedagogy, was brought to Iran and decolonized the curriculum from the previous pedagogy system, Beaux-Arts, and it continued until the Cultural Revolution (1980–1984), when the new Islamic government decided to detoxify the curriculum from Western influence to Islamize it. This paper outlines the transformation of the structure and content of the architecture curriculum to adapt to the sociopolitical agenda of each revolution.

Keywords: Architectural Education, Curriculum, Islamization, White Revolution, 1979 Revolution, Cultural Revolution, Iran

1. WHAT IF THE REVOLUTION MEETS THE CURRICULUM?

“Revolution” means an overthrow or repudiation and the thorough replacement of an established government or political system by the people governed (*Oxford English Dictionary*). In revolutionary moments, everything faces a complete or marked change as the new political system questions, redefines, reshapes, and liberates itself from the structures, objectives, and desires of the overthrown system. Architectural education as a sociopolitical structure has always had an interactive relationship with sociopolitical movements such as revolutions and the reaction of their radical pedagogical studios that tried to take advantage of this social opportunity and reshape the content and process of pedagogy. These studios were inspired by slogans and objectives of these movements that questioned the basis of architecture and its education. For example, radical pedagogical shifts based on sociopolitical protests occurred around the world in the late 1960s and 1970s (Colomina et

al. 2012). Architecture curriculum, as one of most important actors in the studio, has always been a center of controversy in revolutionary moments when the new regime changes its structure and content according to its own aims and slogans. Indeed, it is a kind of decolonization from the previous beliefs, aims, and objectives.

In the case of Iran, from the advent of modern architectural education in architecture universities, Iranian society went through two revolutions, the White Revolution, a sociopolitical reform supported by the monarchy, and the 1979 Islamic Revolution, which built on social protests to overthrow the Pahlavi dynasty. Suffice it to say that the two revolutions were critical and crucial periods in the contemporary history of Iran and were concurrent with other anticolonial revolutions around the world that occurred in the Cold War era and had radical and fundamental effects on architectural practice and pedagogy. In the context of each revolution, architectural education was faced with a very different and revolutionary process in envisioning new modes of pedagogy. This paper investigates the effect of the White (1963) and the Islamic (1979) Revolutions on the structure and content of the architecture curriculum to ally it with their respective agendas and slogans—from the agenda of development according to the utopia of the Great Civilization to the agenda of Islamization according to the utopia of Islamic unity (Heisey and Trebing 1983, 171).

1.1 Toward a Great Civilization: Development, City, and Heritage in the Curriculum

The emergence of modern architectural education in Iran was accompanied by the opening of the Fine Arts Department at Tehran University based on the Beaux-Arts system in 1940 (Ansari 2016, 26), but after two decades, architectural education faced its first revolution. In 1963, Mohammad Reza Pahlavi, the king of Iran, instituted the White Revolution, or the Revolution of King and People, as a sociopolitical reform to modernize and achieve the utopia of a Great Civilization (Figure 1). This revolution was supported and financed by the United States through loans from the US Marshall Plan and the Point 4 Program, designed to avoid the influence of the Soviet Union and communism in countries in developing areas of the Middle East, Latin America, Asia, and Africa (Paterson 1973, 119). The development agenda of the revolution and the return of a group of foreign-graduated Iranian architects led to the opening of some new universities, private and public, with a new system of education, such as the National University, the first private university in Iran. Consequently, the second school of architecture in Iran was established in 1960 at National University by some foreign-trained Iranian architects, mostly back from the University of Rome, such as Masoud Jahanara, Harmik Mogardechian, Baqer Hatami, Manouchehr Marjan, Houshang Marjan, and Nimrud Khachi (Bidhendi and Sepehri 2016, 28).

The initial pedagogical approach in the school was based on a mixture of Italian and French pedagogy in an annual course-based system similar to that of the United States (Ardalan 2019, 13), but after a visit from the king, Mohammad Reza Pahlavi, and the Empress Farah Pahlavi, to the School of Architecture in 1967, during which the king emphasized that the art and architectural heritages were precious reserves of the country and great examples of Iranian genius that could lead toward a Great Civilization utopia, and spoke of the need to train specialized architects in the conservation and restoration of historical monuments, the architecture school decided to increase collaborations with other international universities that had a wealth of knowledge and experience in this field. Therefore, in 1967, IsMEO (Associazione Internazionale di Studi sul Mediterraneo e l'Oriente) facilitated a *jumelage* agreement between National University and the University of Florence. Within the framework of the agreement, restoration courses officially started

within the architecture curriculum of National University, taught jointly by IsMEO, the Faculty of Architecture of Florence, and Professor Piero Sanpaolesi (“IsMEO Activities” 1967, 345). Moreover, the agreement paved the way for many Italian architects, such as Luigi Moretti, Marco Dezzi Bardeschi, Leonardo Ricci, Ludovico Quaroni, Leonardo Benevolo, and others, to come to Iran to present lectures on the new directions of architecture and city planning in Italy (Dezzi Bardeschi 1972, 1–4; “IsMEO Activities” 1974, 485). This was a turning point that increased the collaboration between Italian architecture universities and two architecture faculties in Iran, National University and Fine Arts Faculty at the University of Tehran, and changed the content of the architecture curriculum. In 1970, the second *jumelage* agreement was signed between Fine Arts at the University of Tehran and the University of Rome through IsMEO. These collaborations continued through various exhibitions, conferences, and academic exchanges, all of which played an influential role in shaping architectural pedagogy in Iran (National University of Iran 1970).



Figure 1: Shah Mohammad Reza Pahlavi hands out ownership documents of land to new owners during land reform in the White Revolution, 1963

(Catherine Legrand, Jacques Legrand)

Unlike the Beaux-Arts system, in which history and drawing courses formed the main core of the curriculum, and knowledge and comprehension of the architectural past informed the teaching of design and drawing (Mađanovic 2018, 10), the new curriculum introduced a significant increase in theoretical courses and diverse contents that related to development issues such as urban design and planning; conservation of historical centers and monuments; and designing new typologies such as hotel, mass housing complexes, and futuristic spaces in Architectural Design courses in the fourth and fifth year. These new contents were totally aligned with the agenda of the White Revolution to develop and modernize the country, but what were the main sources of inspiration for the new curriculum? And how were these sources created?

The architecture curricula at the University of Rome and University of Florence in the 1960s were the main sources of inspiration for the new curriculum in Iran (Figure 2). The 1960s was a decade of radical movements around the world and a time when various academic institutions, groups, professors, and students tried to redefine and reshape the relationship between architectural education and society. In Italy, the faculties of architecture of Milan, Turin, and Rome encountered some student occupations in which students attacked the academic system concerning the teaching methods and the absence of research (Pedrabissi 2013). Many radical experiments and ideas were created by academic circles inside and outside the universities, from Archizoom, Superstudio, and 9999 to professors such as Leonardo Benevolo, Ludovico Quaroni, Adalberto Libera, Leonardo Ricci, and Leonardo Savioli. For example, Ricci and Savioli brought new ideas regarding the relationship between the user, space, and the city that led to the addition of new courses such as interior design and visual design in the curriculum (Pedrabissi 2013), and Ludovico Quaroni, Giancarlo De Carlo, Aldo Rossi, and Manfredo Tafuri sought to include territorial scale in teaching urban courses that could address problems of “the City and its territory” by turning toward disciplines such as sociology, economics, and geography (Colomina et al. 2012, 79–81). These efforts introduced the diverse urban planning and design courses into the curriculum.

This new style of Italian pedagogy, along with its curriculum, was brought to the College of Fine Arts at National University by foreign-trained architects such as Mohamad Amin Mirfendereski, Mehdi Kosawr, Mansour Falamaki, Masoud Jahanara, Sirous Bavar, Parviz Vaziri, Mohammad Tehrani, and Hossein Ali Olia, and others such as Bahman Paknia and Reza Kassai organized the first and second Italian architecture exhibitions in collaboration with the University of Florence and University of Rome in 1972 and 1973 to bring the new radical pedagogy, content, and ideas into Iranian architecture schools.¹ (At the same time, with the White Revolution’s agenda of development to speed up the modernization of Iran, increasing oil trade and the tourism industry, the country entered a period of prosperity (Ardalan 2019, 15). Therefore, the new curriculum and its content supported the development plan of the monarchy by affecting national planning and local construction capability. The main subjects of new courses included designing new urban settlements and upgrading existing urban centers; practical urban planning and design; electrical and mechanical facilities; visual design; history of art and modern architecture; new forms of construction and materials; interior design; restoration and conservation of historical buildings and context; distributive elements of building; designing new typologies such as hotel, hospital, mass housing complexes, and utopian cities (National University of Iran 1970) (see Figure 2).

FIRST YEAR	SECOND YEAR	THIRD YEAR	FOURTH YEAR	FIFTH YEAR	FIRST YEAR	SECOND YEAR	THIRD YEAR	FOURTH YEAR	FIFTH YEAR
ELEMENTS OF ARCHITECTURE AND RELIEF OF MONUMENTS (1)	ELEMENTS OF ARCHITECTURE AND RELIEF OF MONUMENTS (2)	ELEMENTS OF COMPOSITION	ARCHITECTURAL COMPOSITION(1)	ARCHITECTURAL COMPOSITION(2)	ELEMENTS OF ARCHITECTURE AND RELIEF OF MONUMENTS (1)	ELEMENTS OF ARCHITECTURE AND RELIEF OF MONUMENTS (2)	INTERIOR ARCHITECTURE, FURNITURE AND DECORATION (1)	RESTORATION OF MONUMENTS	INTERIOR ARCHITECTURE, FURNITURE AND DECORATION (2)
MATHEMATICS(1)	MATHEMATICS(2)	DECORATION	INTERIOR DESIGN(1)	INTERIOR DESIGN (2)	MATHEMATICAL ANALYSIS AND ANALYTICAL GEOMETRY (1)	MATHEMATICAL ANALYSIS AND ANALYTICAL GEOMETRY(2)	ELEMENTS OF COMPOSITION	ARCHITECTURAL COMPOSITION(1)	ARCHITECTURAL COMPOSITION(2)
DESCRIPTIVE GEOMETRY	PERSPECTIVE	LIGHTING	URBAN PLANNING AND DESIGN(1)	URBAN PLANNING AND DESIGN(2)	DESCRIPTIVE GEOMETRY AND PROJECTIVE ELEMENTS	APPLICATIONS OF DESCRIPTIVE GEOMETRY	STYLISTIC AND CONSTRUCTIVE CHARACTERISTICS OF THE MONUMENTS	LEGAL MATTERS	APPRAISAL AND PROFESSIONAL PRACTICE
DRAWING REAL LIFE(1)	DRAWING REAL LIFE(2)	ARCHITECTURE THEORY	RESTORATION OF MONUMENTS	ESTIMATION AND QUANTITY	GENERAL AND APPLIED CHEMISTRY	PHYSICS	TECHNICAL PHYSICS	TECHNICAL INSTALLATIONS (HEAT, LIGHT, ACOUSTIC)	SCENOGRAPHY
HISTORY OF ART(1)	PLASTIC	HISTORY OF ARTS (3)	SURVEYING	HISTORY OF MODERN ARCHITECTURE	DRAWING REAL LIFE(1)	MINERALOGY AND GEOLOGY	BUILDING HYGIENE	CONSTRUCTION SCIENCE (1)	CONSTRUCTION SCIENCE (2)
TECHNOLOGY(1)	HISTORY OF ART (2)	HEATING	CONSTRUCTION (3)		ELEMENTS OF CONSTRUCTIONS	DRAWING REAL LIFE(2)	RATIONAL MECHANICS AND GRAPHICAL STATISTICS	TOPOGRAPHY AND ROAD CONSTRUCTION	MATERIALS TECHNOLOGY AND CONSTRUCTION TECHNIQUES
FARSI LITERATURE	TECHNOLOGY (2)	CONCRETE	ENGLISH OR ITALIAN		HISTORY OF ART AND STYLES OF ARCHITECTURE (1)	HISTORY OF ART AND STYLES OF ARCHITECTURE (2)	DISTRIBUTIVE CHARACTERISTICS OF BUILDINGS	URBAN PLANNING AND DESIGN(1)	URBAN PLANNING AND DESIGN(2)
ENGLISH OR ITALIAN	ENGLISH OR ITALIAN	ENGLISH OR ITALIAN			ITALIAN LITERATURE	PLASTIC		DECORATION	ART OF THE GARDENS
	CONSTRUCTION (1)	CONSTRUCTION (2)			ENGLISH OR GREMAN LANGUAGE				
	STRENGTH OF MATERIAL AND STATIC OF BUILDING								
	MATERIALS OF CONSTRUCTION								
					GENERAL SCIENCES	VISUAL FUNDAMENTALS	LIBERAL ARTS AND SCIENCE	HISTORY AND THEORY	DESIGN AND GRAPHICS
					ARCHITECTURAL SCIENCES	PRACTICAL EXPERIENCES	URBAN PLANNING AND DESIGN	MISCELLANEOUS	

Curriculum Guideline

Figure 2: From left to right: Architecture curriculum at National University (1970); architecture curriculum at University of Rome (1963)
(Translated and created by the author)

In the 1970s, by establishing new architecture schools, such as Science and Technology University, the School of Decorative Art, and Farabi University, and organizing some international architectural conferences and exhibitions, the monarchy, the universities, and architects tried to improve and develop the pedagogical methods and content of a regional architectural education and the curriculum that would build toward a Great Civilization. For example, in 1970, the Ministry of Housing and Development, with the support of Empress Farah Pahlavi, held an international architectural conference titled “Interaction of Tradition and Technology Congress,” with the collaboration of many famous architects such as Paul Rudolph, Louis Kahn, Ludovico Quaroni, Georges Candilis, Aptullah Kuran, Buckminster Fuller, and Oswald Ungers (Figure 3). In one part of the conference that was specifically allocated to architectural education, these architects and professors from various architecture schools discussed ways to advance regional architecture pedagogy in content, methods, and curriculum and also how to increase interaction between pedagogy and the profession (Mozaffari and Westbrook 2020, 56). The 1970s was a period for

searching, analyzing, and finding the pedagogy for the future in the era of development in Iran, but the 1979 Islamic Revolution changed the direction.



Figure 3: Interaction of Tradition and Technology Congress, Isfahan, Iran, 1970

(Empress Farah Pahlavi and (from left to right), Oswald Ungers, West Germany; Paul Rudolph, USA; Philip Will, USA; Louis I. Kahn, USA) (Ministry of Housing and Development of the Imperial Government of Iran)

1.2 Creating Islamic Unity: Islamic Architecture and City Utopia in the Curriculum

The 1979 Islamic Revolution, which built upon the social protests aimed at overthrowing the Pahlavi dynasty, had radical and fundamental effects on architectural practice and pedagogy. In the context of the revolution, architectural education headed in a very different direction in comparison with that of the previous monarchy. Despite the emergence and growth of diverse sociopolitical communities that supported and helped the 1979 Revolution succeed, these elements were a serious threat to the Islamic government after the revolution. Therefore, the Islamic revolutionary government decided to run a second revolution to purify universities from leftist and nationalist forces. This revolution was inspired by the Cultural Revolution that took place in China from 1966 to 1976. The Cultural Revolution in Iran took place from 1980 to 1984, and one of its goals was to Islamize the universities; subsequently, they were shut down to Islamize the system, structure, and content of architectural education (Figure 4).



Figure 4: Some slogans from the Iranian Cultural Revolution: from left to right, “Studying at the American University even for one day is a betrayal of the nation”; “Today, the university needs a Cultural Revolution”; “The university should be Islamic and for the people.”

(*Jame'eh va Memari* 1980, National Library and Archives of the Islamic Republic of Iran)

In architectural education, the extremist Islamic Republic and revolutionary forces attempted to control and Islamize the pedagogy by purging design studios of their imperialist agents, such as teachers, students, books, curricula, and journals. This purification was in line with social aims and the nature of the revolution: giving independence and erasing imperialism, similar to other socialist, anticapitalist revolutions that occurred around the world in the Cold War era, such as the Cuban Revolution of 1953–1959 and the Chinese Revolution of 1949, which emphasizes the relational connection between these revolutions in terms of structure, content, and process in design pedagogy and studios. The headquarters of the Cultural Revolution selected some revolutionary Islamic teachers and students to form an architecture committee to review and change the theoretical framework, structure, and content of the curriculum (Cultural Revolution Headquarters 1984, 5). With regard to the slogans and aims of the 1979 Islamic Revolution, such as following Islamic art and architecture, providing fair development and housing for poor areas and low-income people (Figures 5, 6), the committee tried to respond by changing the definition of architectural education, aiming to align the expectations of the revolution and society with those of architecture graduates.



Figure 5: “Every person should have a house. It is a minimum right of every person.” (Imam Khomeini)

(*Jame'eh va Memari* 1980, National Library and Archives of the Islamic Republic of Iran)

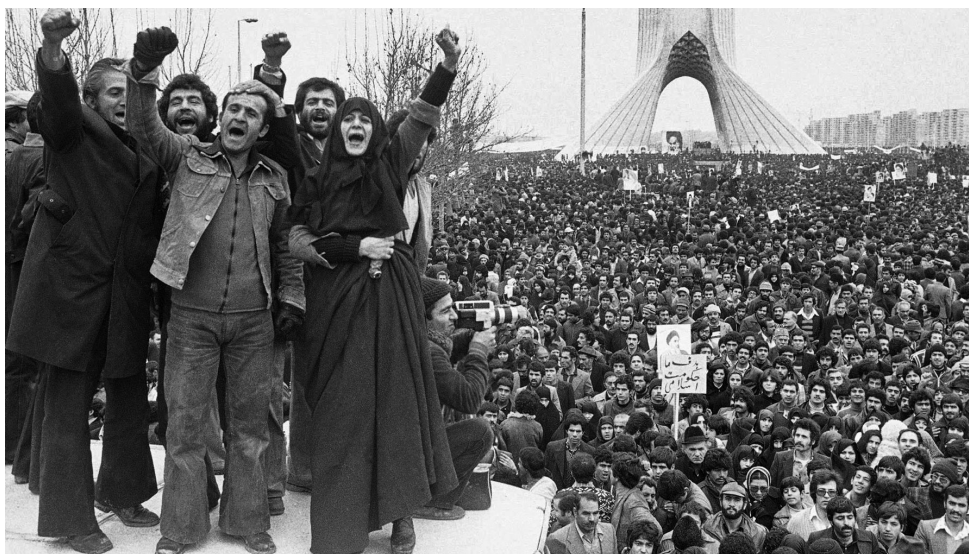


Figure 6: “No East, No West, Just Islamic Republic”

(*Jame'eh va Memari* 1980, National Library and Archives of the Islamic Republic of Iran)

1.2.1 Definition and Aims of the Islamic Architecture Curriculum

In the introduction of the first architecture curriculum written after the Cultural Revolution, the committee pointed out that the structure, content, and curriculum of architectural education were reviewed and developed to implement the principles of the Iranian Constitution, including “part b of the second principle, as well as providing a condition to implement the thirty-first, the first clause of the thirty-third principle, and other principles that refer to providing housing, emphasizing the growth of human values and beliefs and a reflection of these values in architecture practice and education” (Cultural Revolution Headquarters 1984, 88). Consequently, based on these aims, the committee referred to the sentences in the Quran and other religious sources that defined architecture as a cultural phenomenon that not only provides shelter for humans but also a place to express human values, faiths, and beliefs. Thus, the purpose of architectural education was defined as one of training students who have the ability to design and organize the human habitat, both physically and spiritually, to increase the quantitative and qualitative dimensions of society’s goal to reach its values (Cultural Revolution Headquarters 1984, 89).

To apply these aims in the curriculum, the committee set up a theoretical framework to redefine and reshape a connection between architecture and other sciences. It was divided into three areas:

1—Values and Beliefs: Values provide a foundation and basic approach to the architect. He/she is always influenced by his/her worldview and beliefs and tries to apply them in his/her works. Therefore, there is a potential connection between architecture and Islamic human sciences to apply their values in the built environment. This led to the creation of courses that change and develop the student’s values and beliefs according to the values of Islam and the revolution, such as Arabic, Knowledge of Islam (1, 2), History of Science in the Islamic World, Jurisprudence Principles of the Constitution, Logic and Methodology (1, 2), and Contemporary Society of Iran and the Islamic Revolution (Cultural Revolution Headquarters 1984).

2—Wisdom: This is an area of knowledge that the architect should know in his/her design process. Since the architect’s job is to combine and design the human’s habitat space in nature, the two themes of human and nature are the main source of all wisdom and knowledge. Therefore, students should have deep knowledge about nature as a context of his/her design, and humans as users of the context. This is why courses such as Human, Nature and Architecture (1, 2), Geometry (1, 2, 3), Islamic Art and Architecture (1, 2), Village (1, 2), and The Wisdom of Islamic Art were created (Cultural Revolution Headquarters 1984).

3—Combination: Creation and innovation are the main domains of the architect. Acting according to values and accumulated knowledge, the architect tries to create a suitable space for a human’s life. In this situation, architecture releases its artistic character, and for this reason, students should gain artistic skills and abilities. This approach led to the development of courses such as Geometry (1, 2, 3), Composition (1, 2, 3), Architectural Design (1, 2, 3, 4, 5, 6, 7, 8), and Introduction to Artistic Fields. Each of the Architectural Design courses was allocated to design a specific program in different scales. For example, Architectural Design 7 was to design a cultural or religious space such as a holy shrine or mosque, and Architectural Design 8 was to design a small-scale complex city center that has different functions such as residential, commercial, and cultural spaces (Cultural Revolution Headquarters 1984).

1.2.2 Academic System

Due to the multiplicity and variety of courses offered, as well as to achieve full acquisition of the skills of the three areas—values, wisdom, and combination—architectural engineering was defined as a continuous master’s course for at least 6.5 years. A total number of units was 226, and these are explained below (Figures 7, 8):

Public Courses	35 units
Basic Courses	36 Units
Main Courses	87 Units
Specialized Courses	47 Units
Elective Courses	10 Units
Workshop Internship	3 Units
Final Thesis	8 Units
Total Units	226 Units

Figure 7: Units of continuous Master of Architectural Engineering (1984)
(Translated and created by the author)

	FIRST YEAR	SECOND YEAR	THIRD YEAR	FOURTH YEAR	FIFTH YEAR	SIXTH YEAR	SEVENTH YEAR
F I R S T S E M E S T E R	MATHEMATICS(1)	GEOMETRY(2)	ELEMENTS AND DETAILS OF CONSTRUCTION(1)	TECHNICAL DESIGN (1)	TECHNICAL DEISGN (3)	THE WISDOM OF ISLAMIC ART	THESIS
	ALGEBRA	HUMAN, NATURE ARCHITECTURE (2)	ISLAMIC ART AND ARCHITECTURE(1)	ARCHITECTURE THEORY (1)	THEORY OF RESTORATION OF HISTORICAL CONTEXT AND BUILDING (1)	ARCHITECTURE DESIGN (7)	
	KNOWLEDGE OF ISLAM (1)	KNOWLEDGE OF ISLAM (2)	ARCHITECTURE DESIGN (1)	ARCHITECTURE DESIGN (3)	ARCHITECTURE DESIGN (5)	DESIGNING HABITABLE COMPLEXES (1)	
	HISTORY OF SCIENCE IN THE ISLAMIC WORLD	ARCHITECTURE COMPOSITION (2)	STATIC (3)	STATIC (5)	INTRODUCTION TO ARTISTIC FIELDS	THEORY OF DESIGNING HABITABLE COMPLEXES(2)	
	FARSI LITERATURE	STATIC (1)	REGULATING ENVIRONMENTAL CONDITIONS (3)	WORKSHOP MANAGMENT	APPRENTICESHIP	KNOWLEDGE OF ISLAM (3)	
	ENGLISH LANGUAGE	REGULATING ENVIRONMENTAL CONDITIONS (1)	VILLAGE (1)	ARCHITECTURE OF THE WORLD (1)	CONTEMPORARY ARCHITECTURE(1)		
	ARABIC LANGUAGE	KNOWLEDGE OF MATERIALS	PRINCIPLES OF CONSTITUTION JURISPRUDENCE	CONTEMPORARY SOCIETY OF IRAN AND THE ISLAMIC REVOLUTION	RESEARCH METHODS		
S E C O N D S E M E S T E R	MATHEMATICS(2)	GEOMETRY (3)	ELEMENTS AND DETAILS OF CONSTRUCTION(2)	TECHNICAL DESIGN (2)	RESTORATION DESIGN	THESIS	THESIS
	GEOMETRY(1)	SURVEYING	ISLAMIC ART AND ARCHITECTURE (2)	ARCHITECTURE THEORY (2)	THEORY OF RESTORATION OF HISTORICAL CONTEXT AND BUILDING (2)	ARCHITECTURE DESIGN (8)	
	HUMAN, NATURE, ARCHITECTURE (1)	ARCHITECTURE COMPOSITION (3)	ARCHITECTURE DESIGN (2)	ARCHITECTURE DESIGN (4)	ARCHITECTURE DESIGN (6)	DESIGNING HABITABLE COMPLEXES (2)	
	ARCHITECTURE COMPOSITION(1)	STATIC (2)	STATIC (4)	INDUSTRIAL DEISGN AND PRODUCTION OF BUILDING	THE EVOLUTION OF HABITABLE COMPLEXES	THEORY OF RESTORATION OF HISTORICAL CONTEXT AND BUILDING (3)	
	FARSI LITERATURE	REGULATING ENVIRONMENTAL CONDITIONS (2)	REGULATING ENVIRONMENTAL CONDITIONS (4)	QUANTITY SURVEYING AND ESTIMATING	THEORY OF DESIGNING HABITABLE COMPLEXES(1)	LOGIC AND METHODOLOGY IN ISLAM (2)	
	ENGLISH LANGUAGE	ENGLISH FOR ARCHITECTURE	VILLAGE (2)	ARCHITECTURE OF THE WORLD(2)	CONTEMPORARY ARCHITECTURE(2)		
	ARABIC LANGUAGE	HISTORY OF ISLAM	LOGIC AND METHODOLOGY IN ISLAM (1)				
	SPORT						

General Sciences	Visual Fundamentals	Liberal Arts and science	History and Theory	Design and Graphics
Architectural sciences	Practical experiences	Urban planning and design	Miscellaneous	

Figure 8: Architecture curriculum after the cultural revolution (1980–83) for all architecture universities (1984) (Translated and created by the author)

Along with these courses, three areas were offered in parallel and in a specialized way; these could be presented as a separate Master of Architecture for those who came from different fields (Cultural Revolution Headquarters 1984).

- 1—Planning and designing habitat complexes
- 2—Conservation and restoration of historical context and buildings
- 3—Specialized design

The area of planning and designing habitat complexes was created specifically to respond to the housing issue as one of the main slogans of the 1979 revolution. It included courses such as The Evolution of Habitable Complexes, Theory of Designing Habitable Complexes (1, 2, 3), and Designing Habitable Complexes (1, 2). Each of these courses has a specific aim and syllabus; for example, The Evolution of Habitable Complexes includes the following sections:

- History of complexes and shaping their forms in Iran (from before Islam to contemporary society and the 1979 Islamic Revolution)

- History of complexes in and out of Iran (West and East) and the Islamic world (from Medieval to Renaissance, from the industrial revolution to contemporary times; a history of the complexes in Asia, such as China, Japan, India, and the Middle East; and finally a history of the habitable complexes in the era of Islam, from the era of the Prophet of God, Muhammad, in Saudi Arabia to the spreading of Islam around the world).

Contemporary theories of designing habitable complexes includes these sections:

- Introduction and planning in the Islamic Republic of Iran, sociology and a definition of human and family in Islam, demographics, public participation in designing and constructing the complexes, rural and tribal studies in Iran, urban and rural geography and ecology.

- Designing habitable complexes includes designing living quarters or houses in rural areas and cities.

- Designing and providing a plan of social human organization and a plan of participation of local people in construction (Cultural Revolution Headquarters 1984).

The curriculum includes all utopias, ideologies, and expectations of the Islamic Revolution and its regime about architectural education and the duty of architects and graduates toward the country and the revolution. Since 1984, to control and centralize the system of education, all architecture universities around the country have had a unified curriculum, and they are not allowed to change the structure or content of the curriculum to accommodate their local, geographical, and social needs.

2. CONCLUSIONS

In conclusion, the paper draws a connection between the White and Islamic Revolutions and architectural education, and shows how architectural education had to adapt itself to the agendas, utopian ideals, and aims of each revolution. Consequently, the design studio faced radical changes in its network of actors, and the curriculum, as one of the main actors in the studio, played a role as a sociopolitical agent in adjusting its structure and content to the new regimes and society. In the White Revolution, the curriculum introduced concepts related to development, such as urban planning and design, conservation and restoration of historical context and buildings, and scientific approaches into the studio. In the 1979 Islamic Revolution, which was a radical sociopolitical movement to support the masses and poor people, and was based on anti-imperialism, the issue of housing, fair development, and Islamism were considered in the curriculum in the form of courses related to villages,

Islamic art and architecture, the wisdom of Islamic art, and the theory and designing of habitable complexes.

This paper leads us to do more research to examine the design studio as a sociopolitical assemblage and to identify and translate the spatial network of connections between power and pedagogy. Accordingly, design studios consist of human and nonhuman actors, such as professors, students, curricula, design briefs, models, drawings, books, magazines, which are politically heterogeneous and shape controversial networks (Figure 9). The White Revolution and its development and modernization agenda, with the support of the United States and the West, changed the structure and content of architectural education and its process in design studios, but while the structure and content in the curriculum were in line with the revolution, professors who mostly studied in Italy and Islamist students had different interpretations of the agenda of development that had a leftist, anti-development, and mass tendency. This controversy in the network of actors in design studios led to emerging controversial debates in the form of radical pedagogical experiences and even political acts that were in complete contradiction to the goals of the White Revolution. This path led to the active presence of architecture students in the 1979 Revolution with the anti-West and anti-imperialism slogans.

Indeed, the White Revolution (1963), unlike the Islamic Revolution (1979), was a socioeconomic reform movement with the aim of development in foreign relations, economics, and modernization of society's institutions, which transformed and expanded the actor network of architectural education in Iran. This network included new national and transnational actors, such as domestic and foreign architects, curricula, books, magazines, exhibitions, and conferences. It led to the presence and strengthening of the discourse of development, modernization, urban planning, and design in Iran, while the Islamic Revolution (1979), with its anticapitalist and de-Westernization discourse, led to purging imperialist actors from the network of architectural education through the Cultural Revolution (1980–83). This created a controlled and limited actor network for architectural education to expand the discourse of de-Westernization and independent, vernacular, and Islamic architecture.

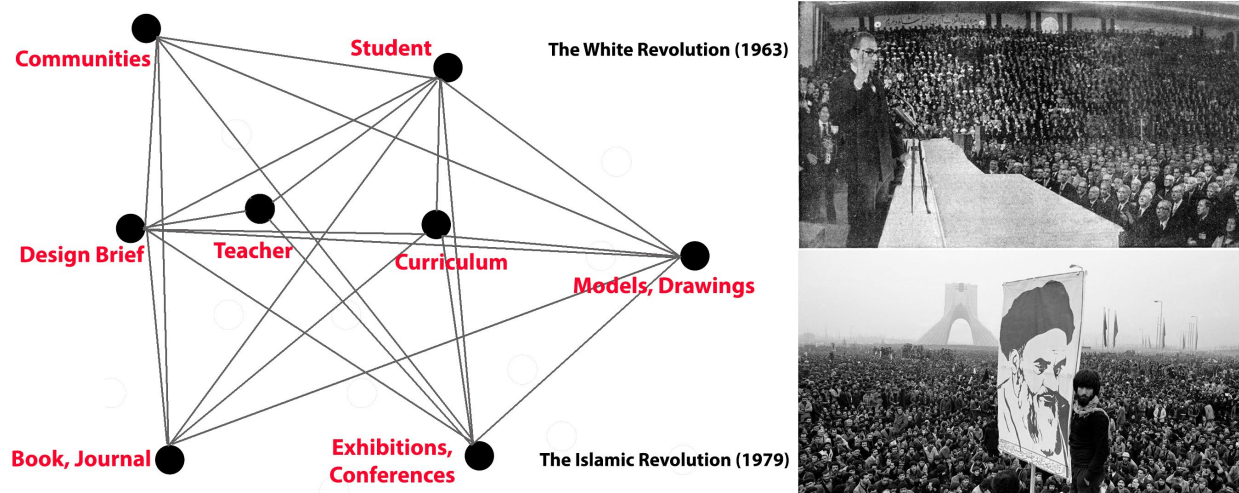


Figure 9: Design studio as a sociopolitical assemblage of actors

(Created by the author)

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Ali Javid is a PhD student in Architecture at UWA School of Design. He is studying the theory of creating new interdisciplinary design studios that respond to socioeconomic and technological changes. His research interests cluster around the following: design pedagogy, application of serious games to use in a design studio and architecture practice, transdisciplinary design studio, the theory of creating a responsive design studio. This paper is part of his PhD research, “The Revolutionary Studio: When a Studio Could Act as an Agent,” which is funded by the University of Western Australia, School of Design, under the supervision of Dr. Nigel Westbrook and co-supervisors Dr. Ali Mozaffari and Dr. Maria Ignatevia (2018 to the present).

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¹ In the 1970s, IsMEO and its president, Giuseppe Tucci, held two important itinerant Italian architecture exhibitions in Tehran: first, *Italian Architecture in the Sixties* in the Faculty of Fine Arts at University of Tehran in 1972, and second, *Italian Architecture 1965-1970* in the Faculty of Architecture at National University in 1973. During the Cold War, these exhibitions were not limited to Iranian universities; according to Tucci, Iran was the gateway for Italian architecture exhibitions to the Middle East and Central Asia. Italian architects such as Aldo Rossi, Ludovico Quaroni, Vittorio Gregotti, Paolo Portoghesi, Leonardo Ricci, and others contributed to the exhibitions by presenting lectures, publishing essays, or conducting projects. The content of the exhibitions included critical catalogues of trends in Italian architecture over a ten-year period, the 1960s, such as projects on the genesis and development of urban structure, and constitutes a vital phase in overcoming the opposition between city and country and the city-architecture dichotomy as well as in the much-needed renewal of architectural language.

THE STRANGER IN THE ARCHITECTURAL PROJECT ON THE CITY

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ABSTRACT

This paper presents the project “Two Strangers Meet in a Parking Lot” and associated research studios as a case study of decolonized architecture pedagogy. The project conceptualizes the stranger as an alternative architectural user, creating a dialectical conversation with the users and architectural visions from architectural history. This dialogue encourages new pedagogical research methodologies related to the topic of city design. The case study uses these methodologies to recuperate lost cultural histories of Tennessee Town, an overlooked neighborhood in Topeka, Kansas, with an important connection to the Harlem Renaissance.

According to Kwame Anthony Appiah, strangers transgress and challenge cultural boundaries by creating conversations at the edges of these borders, yet strangers counterintuitively utilize the environments in the city that are initially foreign to them to produce alternative cultural knowledge. This interaction between stranger and entities in the city provides a model for how disciplines can communicate across their own boundaries. The strangers’ conversation, when transferred to the architectural studio setting, becomes what Mark Linder calls “transdisciplinary” discourse, which occurs at the borders of adjacent disciplines. The resulting knowledge intentionally highlights overlooked and misinterpreted cultural moments in the city while creating an alternative to traditional interdisciplinary modes of working, which the philosopher Homi Bhabha says is essential if disciplinary fields are to progress with the global city.

The “Two Strangers” case study consists of built structures that were designed, first, to transform people into strangers and, then, to instigate conversations between them. As a result, strangers become acquaintances and exchange new knowledge. The architectural studio course explored this idea further by taking students outside of the classroom where they engaged with the community through conversations with city archivists, community leaders, city council persons, urban planners, and museum directors.

Keywords: Architecture, City, Culture, Stranger, Transdisciplinary, Urbanism

1. INTRODUCTION TO STRANGERS

Let's imagine for a moment the last time we each encountered a stranger in the city. Maybe you were in your hometown, but perhaps it was while you were visiting a city; were you walking down the street or sidewalk, or cutting across an empty parking lot, when someone you didn't know and didn't recognize was approaching? And maybe this approaching person was, at first glance, different from you in some way. How did you feel in that moment when you realized you weren't alone but in the presence of a complete stranger? In that moment you were both strangers, and perhaps mutually cautious, maybe even fearful, in this unpredictable and awkward circumstance. I think we can also imagine what would have happened if you both paused in that moment of passing and created a conversation. Interaction between strangers is a common occurrence in the city. This happens every day, and it is part of what makes a city a rich cultural experience. This thought experiment highlights a trait common to all entities that contribute to the collectivity of the city: that at one point in time we are all strangers, and there are times when we have all been just a little bit afraid of strangers (Figure 1).

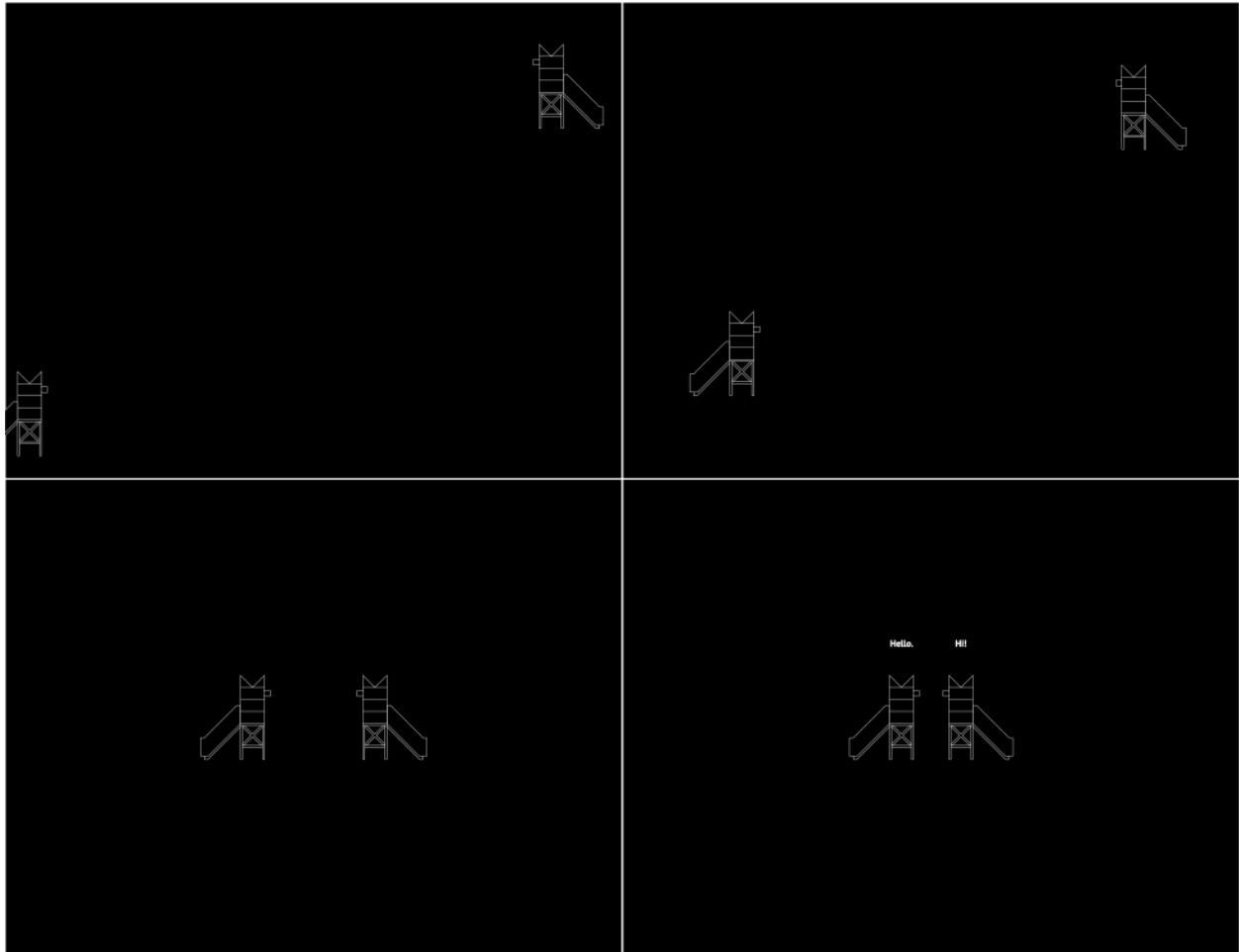


Figure 1: Two strangers meet. (Jared Macken)

2. ARCHITECTURAL USER AS STRANGER

Despite the anxiety surrounding the idea of strangers in the city, these kinds of interactions are a crucial component of our collective environments. Yet, interactions of this sort have been challenged both in contemporary politics and even in design projects. While architects and designers who shape our cities can easily imagine how design affects these interactions, cities have been designed for narrowly defined constituencies. But what would happen if an architectural project on the city sought out these strange interactions and even produced them intentionally through form? What if the city was designed for the stranger? Or, for instance, what would happen if the qualities and characteristics of well-known users from twentieth-century architectural projects were inverted or critiqued by identifying their opposite, and could the stranger be this antithesis? An exploration of these questions provides a critical lens through which architectural projects of the twentieth century may be examined.

Architects are all familiar with the term “user,” how it drives architectural projects on the city, and how the concept of user helps realize a project’s ambitions and ideologies by utilizing specific architectural forms that cater to that user. Consider the list of usual suspects that comes from past projects:¹ the worker, the family guy, le flâneur, the nomad, the participant, *der Bürger* or citizen, the bachelor, and the consumer to name a few (Macken et al. 2013). One characteristic that all these projects have in common is their use of hyperspecific character traits to justify city-scaled projects that embody monocultural lifestyles. Those users have a narrow set of characteristics and a linear script for how they use the cities that are designed specifically for them. Each of the projects tied to those users was driven by a manic ambition to seize control of an ever-changing metropolis. The postwar project on the city was a test bed for these kinds of users. Colin Rowe and Fred Koetter argue in *Collage City* that each of those projects strips citizens of their cultural and social qualities to create the protean universal denizen of the mega/city-scaled utopias each character represents. Rowe lumped them all together with the pejorative term “noble savage,” and while their intentions were well-meaning—to create airy, healthy, safe-space-infused cityscapes for narrowly defined citizens that limited the number of strange interactions—an alternative can still be imagined (Rowe and Koetter 1983). The stranger, for instance, challenges the monocultural nature of those projects, since a stranger does not describe a single specific type of person, but any citizen who brings their own qualities and characteristics to a new city. Strangers engage with all the rich cultural material found in the locations they insert themselves into, combining those qualities with their own to create new cultural artifacts, hybridizing aspects of themselves with their contexts. An architectural project can expand on this aspect of a stranger’s interactions with the city by splicing the qualities of the stranger with the context of the site to create a city that fosters different kinds of interactions between citizens (Simmel 1971). Designing for this kind of user expands the design toolbox of architectural forms and affects, has the potential to tap into lost histories of the city, and in turn reimagines the way an architectural research project can function in relation to other disciplines.

3. STRANGERS' CONVERSATION

Kwame Anthony Appiah confirms this idea of strangers in his book *Cosmopolitanism: Ethics in a World of Strangers*, where he describes them as adept users of the global city, armed with the act of conversation, dialogue, and a curiosity about other ways of life. Appiah's use of the term "conversation" is enhanced with agency when he describes it as a "metaphor for engagement" that enables a stranger to not merely assimilate into their new contexts but create a response to them and ultimately provide pathways for creating new cultural communities and artifacts. Speaking of this dialogue, Appiah states that "conversations across boundaries of identity—whether national, religious, or something else—begin with the sort of imaginative engagement you get when you read a novel or watch a movie or attend to a work of art that speaks from some place other than your own" (2006, 85). Strangers, as the users of the universal city, use engaged conversation to draw out the materials they need to invent something new. They do not completely change their new contexts to meet their needs, nor do they completely abandon their own qualities. Instead, they synthesize them together, thereby contributing to the very places that enhance their malleable identities. Given their adaptability to any context, strangers not only critique past architectural users by breaking the mold of the hyperspecified citizen of the city; they have the potential to carry a little cultural DNA of each one simultaneously. Strangers are the citizens of the universal city, and as such, the city can be designed to provide access to these moments of engaged conversation, thereby resulting in the rich cultural outputs these interactions generate.

4. PROJECT AS STRANGER

In the spring of 2016, the conceptualization of the stranger as an alternative architectural user was tested through the grant-funded project "Two Strangers Meet in a Parking Lot." This project explored how architectural form at a small scale, versus the master planning or megascale, can embrace interactions between strangers in the city.² The form of the structures functioned in two ways: first, their elevational figures resembled two giant strangers facing each other in conversation; and second, they allowed the citizens of the city who interacted with them to become strangers, and then acquaintances, by engaging with one another through intentional conversation (Figure 2).



Figure 2: Two strangers block the entrance of a parking lot in Topeka, Kansas.
(Jared Macken, 2016)

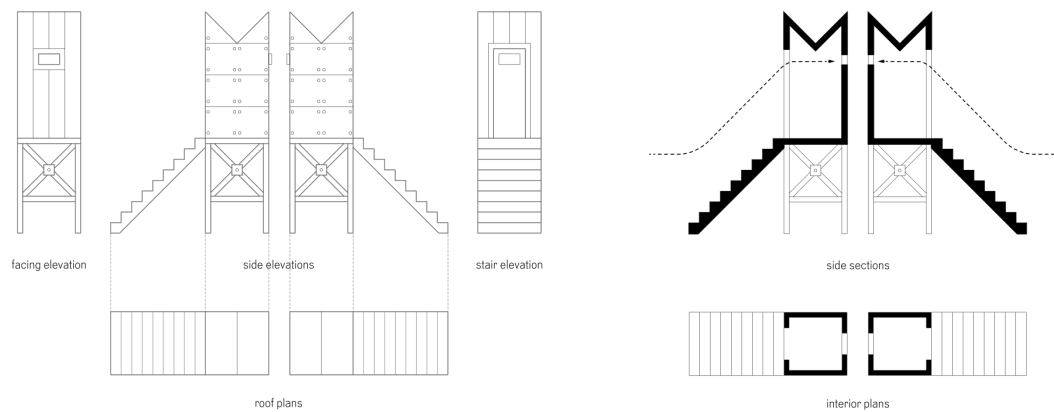


Figure 3: Creating a conversation and dialogue through architectural form
(Jared Macken, 2016)

The two identical structures stood 18 feet tall, consisted of a tail-like staircase that led to a small 4 x 4-foot room, which was topped with earlike roof structures and a protruding window box. Their elevational figures related to each other and loosely resembled anthropomorphic forms, allowing them to exude a critical aura and automatically confront other objects in their immediate surroundings. Their window boxes protruded toward each other, making them appear to be in conversation. Banal elements in the city—like parking lot asphalt, light posts, storefronts, even lean-tos—were highlighted when in the presence of the strangers and appeared to be witnessing these two foreign structures in dialogue (Figure 3). Human inhabitants of the city were ultimately intrigued, if at first anxious, wondering what the structures were. Passersby started to interact with them by climbing the stairs, entering the small room, peeking through the small window box, and coming face-to-face with other human strangers. The window boxes induced conversation and dialogue, functioning like the opening of a giant mask through which each inhabitant was simultaneously connected to another person face-to-face but also given a little protection from the awkward situation. Strangers became acquaintances through conversation and dialogue, and the architectural forms of the structures, that is, stairs, doorway, room, window box, made this interaction possible (Figure 4).

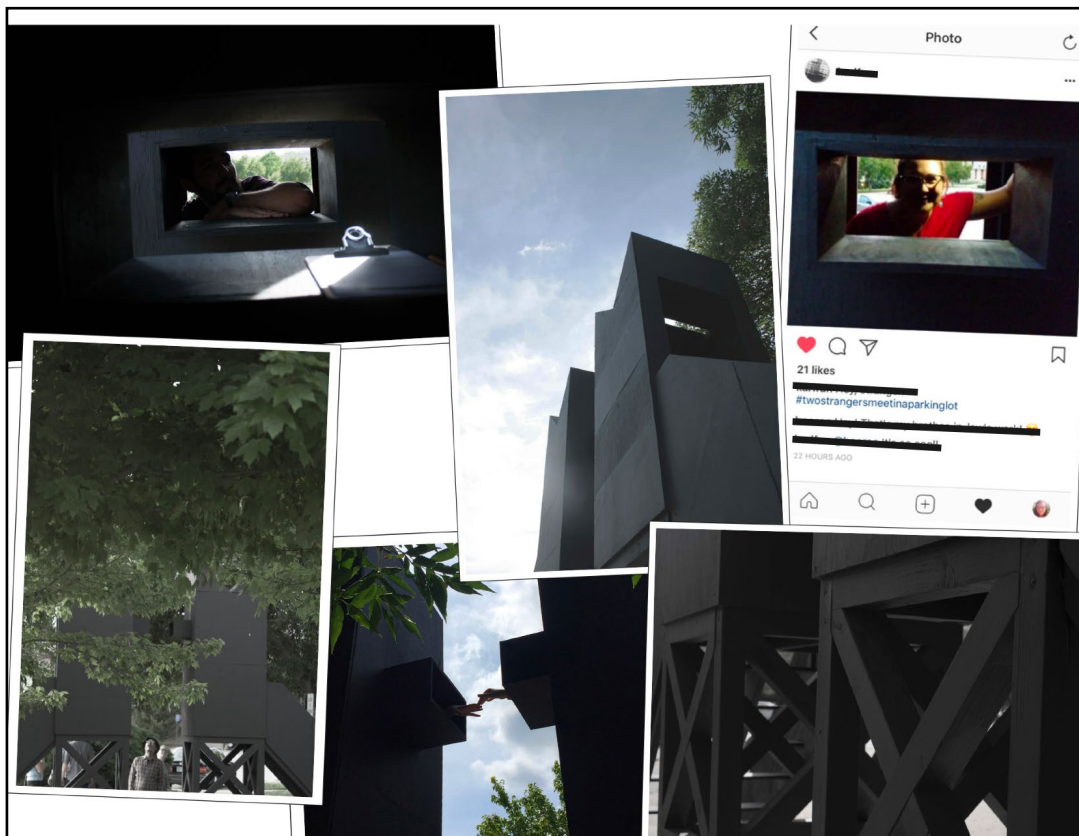


Figure 4: Strangers become acquaintances. (Jared Macken, 2016)

5. DISCIPLINE AS STRANGER

This notion of conversation between strangers becoming a cultural catalyst can also be applied to how disciplines communicate with one another. In his essay “TRANSdisciplinarity,” Mark Linder (2005) argues for a new type of interaction between disciplines, presenting an alternative to what is traditionally labeled *interdisciplinarity*. The relationship between disciplines is similar to the relationship between strangers and the city; while it is important that each discipline maintain its unique characteristics and own discursive output, it is also important that each find ways of creating dialogues with other disciplines so as to contribute to a global intellectual community.³ However, Linder argues that transdisciplinarity’s “aim would not be to assimilate other discourses into architecture or to find common principles or to establish architecture’s dependence on or affinities with related discourses, but to scrutinize particular instances of the translation or transference of concepts, vocabularies, and techniques, and thereby come to terms with the specific discourses that constitute architecture’s distinct, yet mutable, identity as a discipline” (2005, 15). Similar to the way Appiah describes a stranger’s interaction that allows them to combine their qualities with their new context, transdisciplinary interaction allows for each discipline to retain its unique characteristics while absorbing new knowledge through an overlap of discursive ideas. The result is not the elimination of disciplines within a new multiheaded hydra—what Linder argues can occur with interdisciplinarity—but a new outcome that keeps respective disciplines intact while allowing them to adapt into a global intellectual community. If Appiah provides the stranger with their qualities as a universal user of the city, then Linder brings the idea of conversation to a disciplinary context, showing how architecture can not only utilize the stranger as a user in projects but how it can conduct research in dialogue with other fields to inform said projects.

6. PEDAGOGY AS STRANGER

These two ideas of the stranger within an architectural project, both the utilization of it as a user and as a method of doing disciplinary research, were applied to the classroom. In 2016, students at the University of Kansas adopted the stranger as the user but also assumed the role of strangers themselves when they instigated their own disciplinary conversations with archivists, historians, city planners, neighborhood citizens, city council people, and even those in other artistic disciplines. The resulting design studios were called “The Stranger in the City,” and conversations they stimulated led to investigations of the culturally rich histories in the overlooked and underutilized neighborhood of Tennessee Town in Topeka, Kansas. They also helped develop design strategies that highlighted and resurrected site-specific cultural and social qualities that had been lost in the contemporary city.

The site for the students’ projects was situated in the historic Tennessee Town neighborhood of Topeka, Kansas, occupying a whole city block at the geographic center of the city. The north half of the site is a small park dedicated to the visual artist and native Topekan Aaron Douglas. The south half contained a vacant grocery store and a parking lot. The students’ research began with a conversation with the local archivist/historian Donna Rae Pearson, a resident of the neighborhood. Ms. Pearson introduced the students to the city archives she manages at the Topeka and Shawnee County Public Library, just a few blocks north of the site, and she provided them with her own first-person accounts of life in the

neighborhood. Access to historical documents and anecdotal information in the archive allowed the students to assume the role of architectural archaeologists and anthropologists. They quickly uncovered a rich history from 1880s Tennessee Town and discovered an inspiring narrative of the strangers who built the neighborhood's community.

In the 1880s, the neighborhood was an important destination for "Exodusters," a term used at the time to describe African Americans who fled the south for safer communities in the north (Figure 5). These new citizens of Tennessee Town encountered the city of Topeka as strangers, bringing their own cultural qualities and then meshing them with their new context. As a result, a new community thrived, one that included churches, businesses, social clubs, reading rooms, and schools. From these new cultural institutions a neighborhood collective was constructed, and out of this environment emerged prominent twentieth-century figures. Most important to our research in the studio was the visual artist Aaron Douglas, who in 1925 moved to New York City and became an integral member of the Harlem Renaissance.



Figure 5: Poster from Benjamin "Pap" Singleton's Scrapbook that advertised safe passage to Kansas from the south in the 1880s
(Image courtesy of the Kansas State Historical Society)

Douglas, much like the Exoduster community that built Tennessee Town, was a stranger when he arrived in Harlem, but he quickly found work collaborations with the many artistic and intellectual colleagues living in the city at that time. The graphic two-dimensional design principles Douglas developed provided a visual language for the intellectual ideas he

fostered with many intellectual figureheads of the movement, including Langston Hughes and the NAACP's *Crisis* magazine editors among many others. His artwork adorned books, magazines, and the walls of the New York Public Library. But he was also a pioneer in the discipline of art and design. The formal qualities of his artwork were in conversation with other avant-garde artists, utilizing fundamental shapes that expanded into complex figures, each assigned individual hues that, when composed together, embodied the cultural aspects of Harlem and the African American experience. The professor and scholar David Driskell, in an interview with the Metropolitan Museum of Art in New York City, explains that "instead of looking at European modernism, Douglas went forth to study very carefully the great empires of Africa, of Songhai and Mali, and he started to incorporate that into his drawings and into his paintings." He goes on to explain that "[Douglas] was doing something that was two-fold . . . He was looking at Biblical history, but he was also looking at the social plight that African Americans were [in] under the rule of the pharaoh, so to speak" (Driskell 2015). Like Appiah's description of strangers combining their own characteristics with those of their new context to synthesize a new cultural artifact, Douglas did the same. His collaborations were stranger-like, but so was his artwork, which intertwined the characteristics of his cultural and social background with Western myths, creating a hybrid cultural artifact that disseminated the ideas from his artist/intellectual collective of the Harlem Renaissance (Figure 6).



Figure 6: Aaron Douglas, *Aspects of Negro Life: From Slavery to Reconstruction* (New York Public Library mural, 1934)

This way of combining the histories and cultural qualities of converging strangers resonated with the students. These ideas worked their way into their own projects but also helped them develop new design methodologies. For instance, they imitated Douglas's working method, thereby creating for themselves a new design technique that allowed them to consciously highlight, not supplant, existing characteristics of Tennessee Town. This was

most explicitly demonstrated through the way they combined the histories of their site with those they researched from architectural history. For instance, the students learned that the legalization of African American literary societies and reading rooms in the state of Kansas became an important catalyst to the development of the community. This simple urban program—a building that provided a space for a reading room—was crucial to the development of the intellectual community in Tennessee Town, and it resonated with the students so much that they adopted it as a part of their own architectural program narrative. They also learned from interviews with neighborhood citizens and the Topeka councilwoman Karen Hiller that current residents no longer had a space for a reading room. At some moment over the years, the structure that housed the reading room had fallen into disrepair. However, they had been using the grocery store as a similar kind of social condenser, a place they could walk to from their homes and connect with one another through conversation. Similar to the original reading room, the grocery store had been shuttered by the store’s corporate offices just before our studio began researching the site. The students were then inspired to design a reading room and grocery store as a new type of community center, one that was more resilient to changes over time by building into its form a temporal adaptability and spaces for more diverse programmatic uses. After meeting and communicating with an urban planner in Topeka, the students catered their design strategies to the community, populating the city block with programs that the neighborhood had lost over the years, including the reading room, grocery store, and even local businesses and meeting spaces. They made their design comply with the existing urban codes, and then they also invented new provisions through their conversations with the city planner (Figure 7).

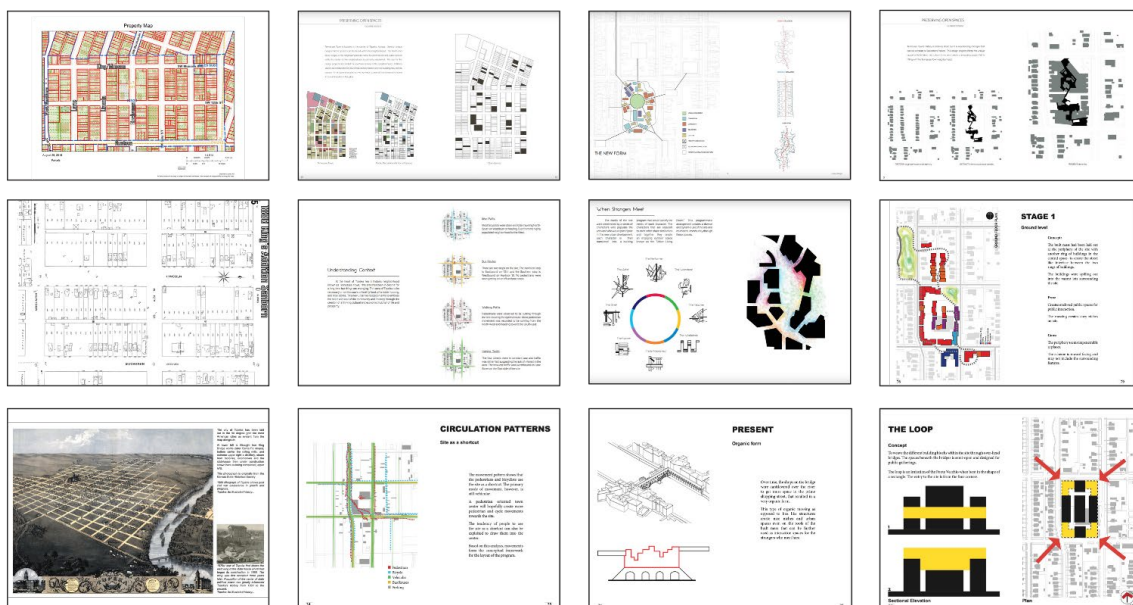


Figure 7: Assorted pages from student research booklets showing the synthesis of the research into design strategies (Student project by Jacob Albrecht and Sierra Dubis, 2016)

7. STUDENT PROJECTS AS STRANGER

With that central programmatic idea in mind, the students' projects explored different ways architectural form, from both the site's context and the history of the city, could be used to resurrect lost programs from Tennessee Town. For instance, the project "Preserving Open Spaces" combined Tennessee Town's planimetric aggregation of building stock with the plan of Split, Croatia, specifically the sector of the city that infilled the abandoned palace of Diocletian, a fortified Roman complex built in the fourth century AD. This resulted in a project that rebuilt the typical street fronts of Topeka, namely, the front porches of bungalows and shotgun houses, but allowed them to extend deep into the block, where massing became atypically repeated and then interconnected using the hybridized plan. The collision of these histories accommodated the spatial diversity needed to create small storefront businesses, large gallery-like community meeting rooms, a grocery store, even residential areas that included artists' studios. All of this was intertwined with plaza-like open spaces. The project simultaneously restores the street fronts that were demolished in the 1960s, retains the "big box" form of the vacant grocery store as a community meeting space, while unifying the new diversity of programs that permeates the block with open plaza-like spaces. New cultural programs were given homes through the project's diverse yet unified forms, including a residency program where artists and researchers living in the studios could access Ms. Pearson's archives down the street (Figure 8).

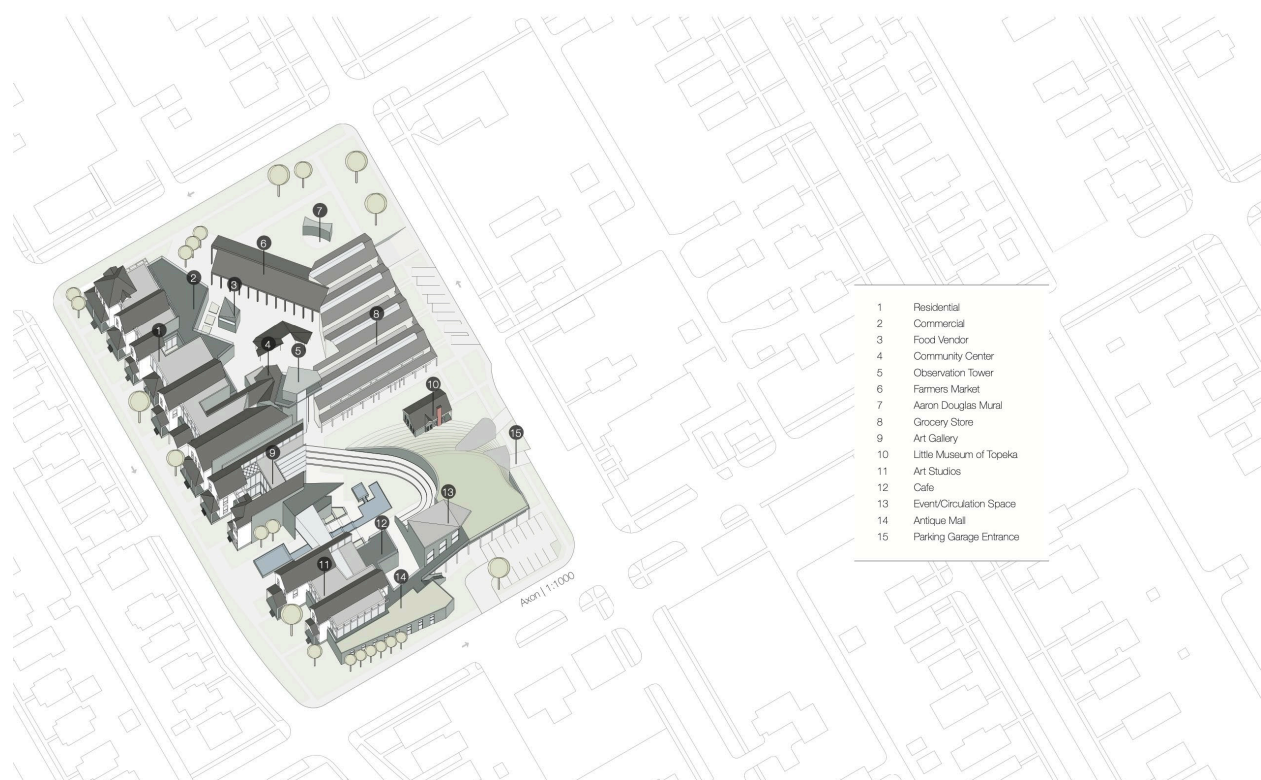


Figure 8: Axon site plan of "Preserving Open Spaces" (Student project by Jacob Albrecht and Sierra Dubois, 2016)

Another project transplants the lost cultural programs of Tennessee Town into the form of classical marketplace bridges, like the Ponte Vecchio built in 1345 (Figure 9). The pathways, storefronts, plazas, and apartments of the Florentine bridge were duplicated and then pulled across the site, not bridging a body of water but the voided block itself, creating many new connections across it. The newly created plazas and pedestrian streets became outdoor meeting spaces, with food markets, local businesses, and interior community rooms that aggregate at the scale of the neighborhood (Figure 10).

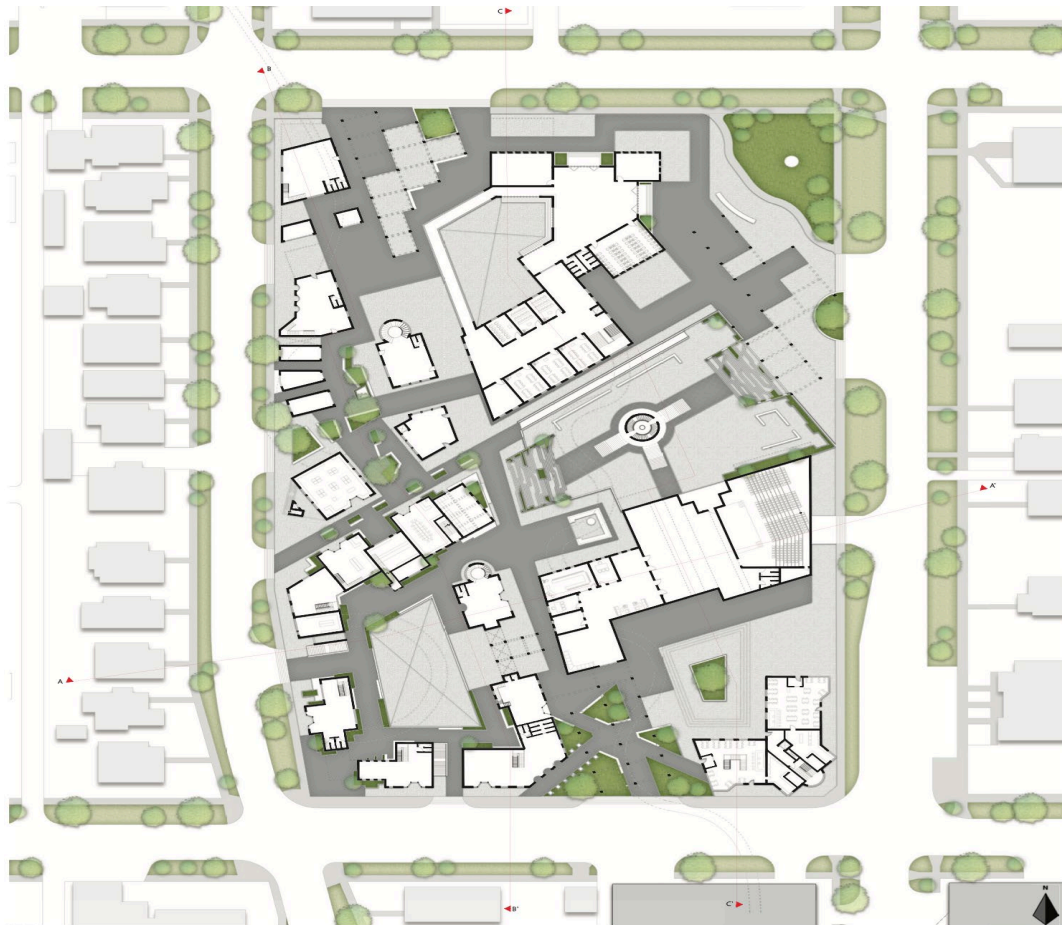


Figure 9: Plan of "Tennessee Corridor" showing how the Ponte Vecchio was used to arrange lost city programs across the site (Student project by Haripriya Madireddi and Bhaswati Mukherjee, Fall 2016)

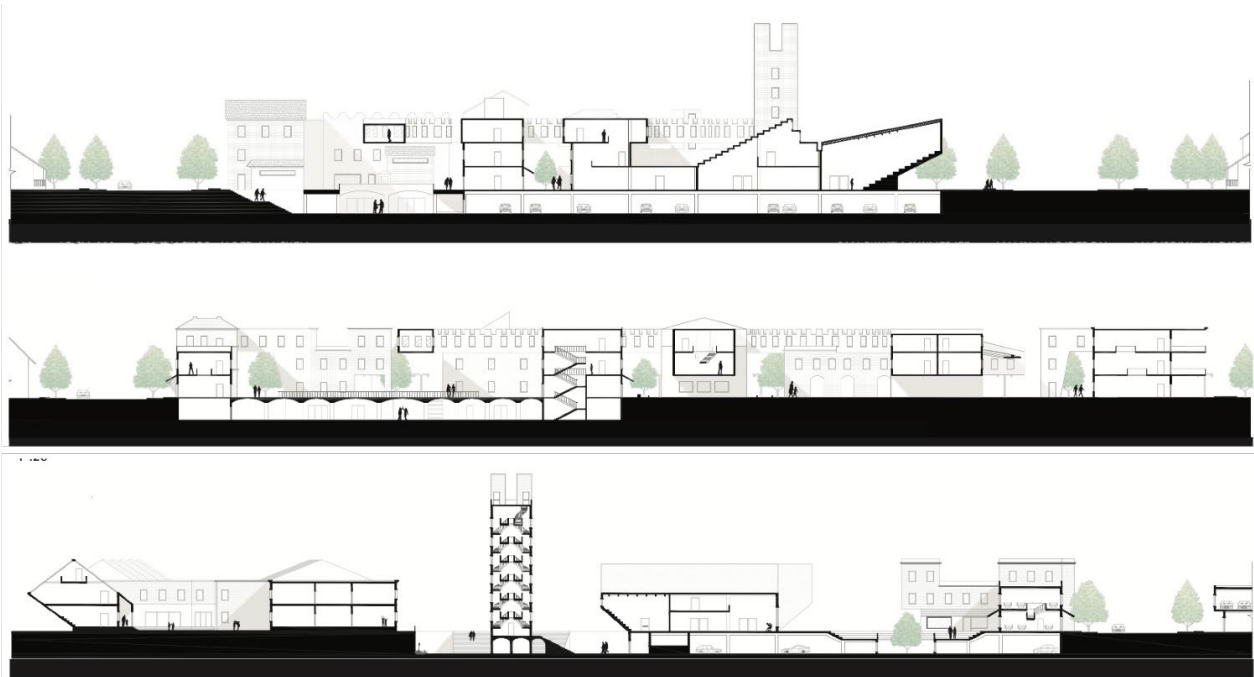


Figure 10: Drawings showing how “Tennessee Corridor” invents new ways that the resurrecting programmatic histories of the neighborhood interact in section (Student project by Haripriya Madireddi and Bhaswati Mukherjee, Fall 2016)

Projects from the class also found different ways to explore how the existing park could better engage with the citizens living in the neighborhood around the site. The project “Collective Living Room” extended the mural that defines the existing Aaron Douglas Park along new walls that define outdoor meeting areas (Figure 11). The murals are displayed through different mediums, utilizing not only paint and mosaic tiles but also digital projections and temporal banners. The walls that receive these cultural images house cafes, readings rooms, and adaptable meeting spaces for the community, including rooms for continuing education programs. Activities in the outdoor living room spaces are intended to extend to evening hours, similar to the way a domestic living room functions, giving the site relevance throughout the day (Figure 12).

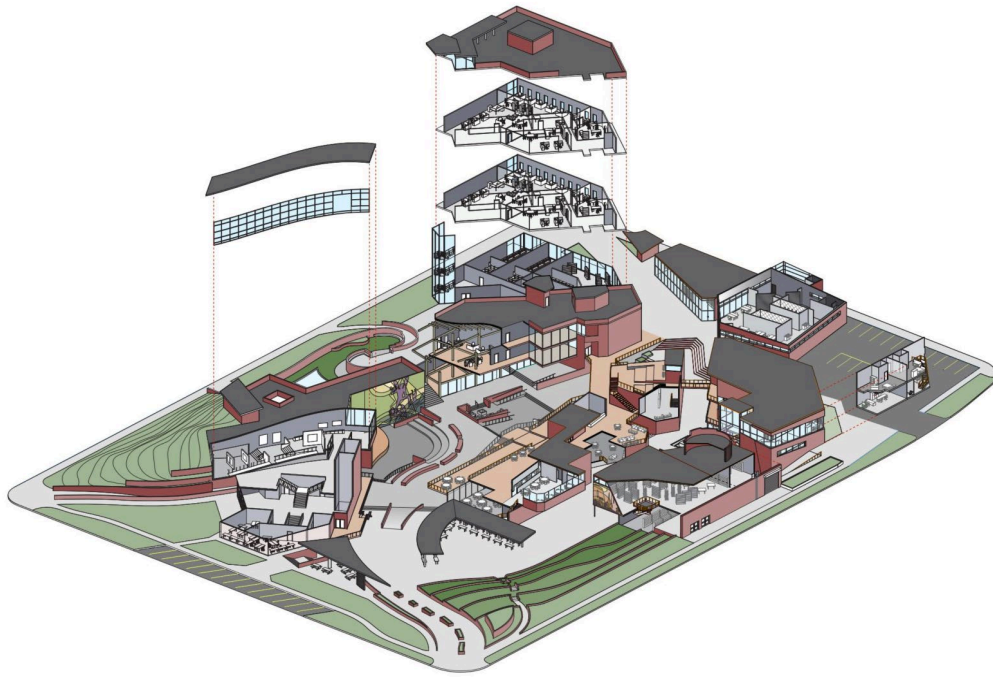


Figure 11: The “Urban Living Room” project extends the Aaron Douglas murals into new meandering pedestrian streets with large meeting spaces and programs interspersed.
(Student project by Kyle Walsh and Simon Davies, Fall 2016)



Figure 12: Events extend into the night as the community uses the “Urban Living Room” as a communal cultural space.
(Student project by Kyle Walsh and Simon Davies, Fall 2016)

Another project also extends the existing park but with a smaller footprint on the site. Simply named “The Aaron Douglas Art Centre,” the project duplicates a small portion of the park vertically by stacking “super porches” into four levels; the lowest sinks below grade to form an outdoor amphitheater. The porches become indoor/outdoor galleries that feature the community activities as a kind of living billboard or mural that is visible from across the park’s open space. Each porch plays host to a variety of activities, including art exhibits, concerts, and receptions. They serve interior spaces that are as adaptable and programmatically diverse as the porches, which can be used for children’s story times, bingo nights, artist residencies, and even spaces for archives that could be used by both the community and researchers from outside the neighborhood. Like Douglas’s artwork, the center combines histories, allowing important aspects of the community’s history to be resurrected (Figure 13).

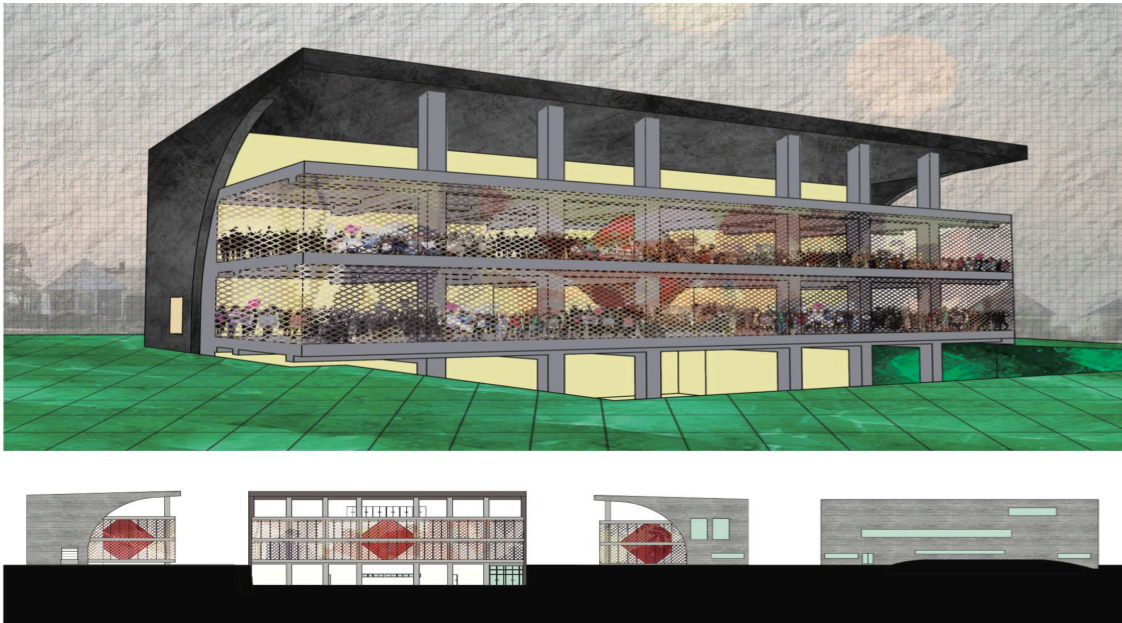


Figure 13: The form of the “Aaron Douglas Art Centre” project extends the park by stacking it into giant front porches. (Student project by Jacob Hansen, Spring 2017)

8. STRANGE CONCLUSION

While utilizing the theories discovered through Appiah’s definition of the cosmopolitan citizen of the city, Linder’s advocacy for a specifically disciplinary form of conversation, and Douglas’s methodology for combining different cultural ideas and histories, the students were able to retell the cultural narratives of Tennessee Town through architectural projects.

Like a city, the classroom was a crossroads of strangers, with students coming from different countries, cultures, social backgrounds, and beliefs, and architecture acting as a unifying common interest. Adopting the stranger as a user helped the students develop a critical mindset for their projects, which explored how architecture could connect to larger cultural ideas related to designing an inclusive city. Becoming research strangers within Topeka allowed the students to create projects that would elevate narratives and histories that had been overlooked, specifically the development of the midwestern city in relation to the African American experience. As a result, knowledge of architectural history was expanded to include the rich characteristics of Tennessee Town, providing an important entry in the lexicon of architectural discourse on the city.

ACKNOWLEDGMENTS

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¹ These users come from projects like constructivism, Ebenezer Howard's garden city, Superstudio, Archizoom, Situationist International, Archigram, Le Corbusier's master plans and megastructures, Ludwig Hilberseimer's architectural urbanism, and Rem Koolhaas's skyscraper to name a few. This list was first compiled as an argument for the stranger as anti-theoretical architectural user in the book *The Western Town: A Theory of Aggregation* (Macken et al. 2013), which explores the relationship architecture has with pop-cultural depictions of the built environment, including its fictional legends in Wild West movies.

² The majority of twentieth-century architectural projects on the city focused on large-scale architectural gestures, which contributes to the use of a singular type of user.

³ On the one hand, a discipline contains its own knowledge base of expertise and uniquely communicates through its own disciplinary modes of representation. Yet, if a discipline closes itself off to the outside world, which contains many different disciplines and therefore various intellectual points of view, it runs the risk of becoming irrelevant in a world that is rich because of its interconnectedness.

COALITION BUILDING AND DISCOMFORT AS PEDAGOGICAL STRATEGIES

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ABSTRACT

Innovative design solutions come from inclusive and diverse design teams (Page 2008). In this paper, I reflect on how such insights can be used in developing pedagogical approaches that use coalition building, knowledge translation between disciplines, and pedagogies of discomfort to foreground implicit biases impacting architectural practice and education. Based on interviews with educators thinking about the built environment, as well as Kevin Kumashiro's (2002) anti-oppressive education framework and Megan Boler's (1999) notion of a pedagogy of discomfort, and building on examples from queer and feminist educators, I suggest in this paper that the disruptive use of feelings and emotions in architectural education can prepare students for more collaborative and inclusive practices. Such discussions allow students to understand the impact of biases but also to think about tools to acknowledge and challenge inequity in the design of the built environment and in the design professions themselves.

Cross-disciplinary collaboration, at both the students and the educators level, can also create opportunities for coalition building, particularly in contexts where a limited number of faculty are explicitly discussing race, gender, disability, class, sexuality, or ethnicity in their teaching. Faculty members with diverse individual self-identifications can multiply their impact by working together to tackle the intersecting ways in which minoritized experiences are pushed aside in mainstream architecture discourses and education. They can also foreground their combined experiences as positive role models to create a constructive learning environment to address these issues, both within universities and directly in the community.

Keywords: Coalition Building, Pedagogy of Discomfort, Queer Pedagogy

Diverse design teams make for more inclusive, but also more innovative, design solutions (Page 2008). This diversity comes from both diverse professional backgrounds and diverse gender, race, ethnicity, class, dis/abled, and sexual identities. Accordingly, coalition building can help develop pedagogical approaches that use knowledge translation between disciplines to foreground implicit biases impacting architectural practice and education. Bringing together students from diverse disciplines—as well as educators and practitioners—can help them acknowledge the biases present in each discipline by highlighting how such biases often manifest themselves in different ways between disciplines. Such discussions allow students to understand the impact of biases, but also to think about tools to acknowledge and challenge inequity in the design of the built environment and in the design professions themselves. However, acknowledging these inequities and biases involves

emotional work that is rarely done in architectural education but is essential to reveal how individual and collective belief systems sustain oppressions.

This paper builds on ongoing research in which I interviewed fourteen queer and feminist educators between 2017 and 2020 to explore how they have sought to imagine modes of teaching that embrace queer and feminist ethics in both content and methods. These open discussions cover how queer and feminist thinking can impact design, but also how it shapes the way these educators teach, including the reception of their teachings by students and colleagues. Interviewees are from different disciplines involved in the design of the built environment in North America, Europe, and Australia; differences between their professional, institutional, and geographical contexts were often part of the discussions.¹ Importantly, many interviewees identified how the various disciplines in which they were involved navigated diversity and inclusion in very different ways, particularly in relation to gender and sexuality.

While they all self-identified an interest in queer and feminist approaches, they also all noted how thinking about gender and sexual orientation represented for them a call for a broader rethinking of how different elements of our identity intersect in our experience and use of space and how we can resist and reshape design norms to make our built environment more inclusive. This shared interest, however, can manifest in different ways: a focus on making visible the contribution of diverse people to the design professions; a challenge to ideological assumptions inscribed in pedagogical methods or in form and composition principles; or a close look at the occupation of space and human relations impacted by design. These varied strategies are presented here before a discussion of the challenges and difficulties of doing such work. Architecture and design present themselves as progressive professions but often ignore the difficult discussions that need to be had to make meaningful but realistic changes to our practices and pedagogies.

1. QUEER STRATEGIES IN DESIGN EDUCATION

Feminist architects and historians have explicitly addressed how architectural education needs to be reformed to acknowledge the gender relations framing the practice of design and, by extension, its pedagogies (see, for example, Weisman and Birkby 1983; Kingsley 1991; Ahrentzen and Anthony 1993; Groat 1993; Groat and Ahrentzen 1996; Anthony 2002; Zipf 2016; Lange and Scott 2017). In contrast, publications and exhibitions addressing queer space theory in design have been focused more on making visible queer figures, challenging traditional forms of architecture, and addressing how some spaces such as domestic spaces or public restrooms oppressed queer people (Vallerand 2020). In other fields, queer thinkers have specifically addressed the tensions brought by queer theory to education and pedagogy. For example, in the mid-1990s, the education scholar Deborah Britzman (1995, 152) identified two pedagogical stakes: “thinking ethically about what discourses of difference, choice, and visibility mean in classrooms, in pedagogy, and in how education can be thought about,” and “thinking through structures of disavowal within education, or the refusals . . . to engage a traumatic perception that produces the subject of difference as a disruption, as the outside to normalcy.” The education scholar Kevin Kumashiro (2002, 32–52) further developed these ideas to argue that an anti-oppressive education must address four perspectives, and, not surprisingly, these perspectives can be found in the strategies used by educators interviewed in this study.

First, we must educate for the Other by improving the experiences of students who are Othered or in some way oppressed in and by mainstream society (Kumashiro 2002, 32). Almost all interviewees stressed the importance of supporting minoritized students as a foundational step toward a more inclusive learning environment. Making sure that students stay mentally and physically healthy gives them the tools to become more engaged and to share with others outside of architecture their understanding of how the built environment can be oppressive. By extension, better encouraging all students—minoritized or not—to understand their body and self-identifications means helping them be more aware of how gender, sexuality, race, age, able-bodiedness, or class interact with space, but also of how norms structure the design professions.

Most interviewees felt more useful when supporting student initiatives than when taking the lead themselves, but also noted a feeling of responsibility to become role models and to create occasions for challenging the racialized, sexualized, and gendered assumptions of architecture and design schools. Becoming role models is, however, not without risks. Interviews have revealed that many North American educators who have attempted to integrate gender and sexuality issues in their studio teaching have faced strong negative pushback from students and colleagues, going as far as being the object of rumors originating from students. This seems particularly true for women in architecture programs, while planning and interior programs as well as programs outside of North America have been more welcoming.

Second, Kumashiro (2002, 39) stresses that we must educate about the Other by working against oppression through a focus on what all students—privileged and marginalized—know and should know about the Other. This aspect has been integral to efforts of feminist, racialized, or queer historians and designers who have focused on making visible how people of diverse identities have contributed to the design professions or how minorities have gained (limited) access to the profession. Developing a dialogue between the canon and hidden histories helps designers acknowledge the limits of their designs to maximize the possibilities offered, to multiply points of view. It opens the discipline not only to other disciplines but to multiple experiences of the built environment.

In addition to helping make minoritized students feel more welcome, the visibility and closeness of positive role models remains one of the most effective ways to transform society. However, this is much more difficult to achieve than it sounds, and experiences vary from one group to another. While a student told me one semester how important she felt my diversity and design seminar had been in changing her understanding of realities she did not know about, the experience the previous year was the complete opposite, with students every week resisting the topics discussed, even if they had deliberately chosen that class as an elective, forcing me on a weekly basis to struggle with trying to think and learn about their resistance. However, by the end of the semester, they all acknowledged that even though they still did not think that most of the arguments we discussed were valid, they were thankful for the occasion to discuss and be challenged in their beliefs. From an educator's point of view, as this group included students from diverse disciplines, the comparison between disciplines was a helpful tool in highlighting how many of the arguments were culturally constructed—in this case, through disciplinary culture.

Third, we must develop education models that are critical of privileging and Othering: educators and students need to examine not only how some groups and identities are Othered in society but also how some groups are privileged, as well as how this dual process is legitimized and maintained by social structures and competing ideologies (Kumashiro

2002, 44). In design, this is done, for example, by queer activists challenging the binary design—and regulations—of public restrooms (Sanders and Stryker 2016), or by feminist scholars questioning the focus on biography in traditional architectural history as a tool of power relations that does not acknowledge the important contributions of diverse groups of people outside of genius figures, almost all of whom are white straight cis men (Van Slyck 1992; Caine 1994).

Finally, according to Kumashiro (2002, 50–52), we must strive to formulate an education system that changes students and society. Oppression is produced when certain discourses are cited over and over; meaningful change thus requires becoming involved in altering the citational practices that reinforce these associations. The weight of tradition and the importance of studio culture makes this the hardest to achieve, but there have been efforts to rethink architecture school from a master and trainees model—with its implicit racial and gendered bias—toward a more collaborative one based on dialogue between instructors and students as well as with the communities and users for whom projects are designed.

The last two perspectives are visible, for example, in the desire of Jaffer Kolb, one of my interviewees, to make students challenge and subvert the educational framework they are going through and the profession they will enter (pers. comm., December 19, 2017), building on Jack Halberstam's (2011, 2, 88) notion of queer failure: "under certain circumstances, failing, losing, forgetting, unmaking, undoing, unbecoming, not knowing may in fact offer more creative, more cooperative, more surprising ways of being in the world. [Failure is] a way of refusing to acquiesce to dominant logics of power and discipline [and to recognize] that alternatives are embedded already in the dominant and that power is never total or consistent." This can be done by challenging what is traditionally seen as success in studio learning, such as producing overly polished presentations or superfluous diagrams, which Kolb sees as reinforcing pedagogical power dynamics that become embedded in the culture of the field. This makes students aware of the pressure that is put on them by design schools to produce large quantities of finished work, to work constantly on a project to the detriment of their health, and to lose connection with the outside world, despite the difficulty this presents for students who struggle with the idea that their "unfinished" projects could be less good than those of their colleagues in other studios. In my own teaching, I have asked students to reflect on their feelings in reaction to projects or readings, in addition to bringing them in direct contact with groups they might not know about. For example, students in an interior architecture studio were asked to expand a space for a queer anticolonial community group in Phoenix, Trans Queer Pueblo. As an educator, I thought the project was an important opportunity to bring together my expertise in queer and feminist studies with the TQ Pueblo's embodied experience as queer and racialized people. As part of the effort, students met with the group leaders and visited other spaces designed for homeless people. In both cases, they reacted very strongly emotionally, moved by the life stories of the people we met, but were also shocked by the spaces we visited and the resiliency of the users. Most importantly, they mentioned many times how they were learning very differently from the group's members, but they also struggled with the conflicting desire to fit within the traditional peer-reviewed framework of the design critique, despite my efforts to explain that the project should be developed for the community rather than for other designers.

These perspectives are also present in the desire of some educators to engage with communities to operationalize a belief in transforming the built environment and to create a

connection between this engagement and their classroom. For example, building on knowledge developed in their studio and seminar teaching, Lori Brown (2013; pers. comm., January 22, 2018) has been using feminist methodologies in the design of abortion clinics, while Joel Sanders, Susan Stryker, and Terry Kogan have created Stalled! to prototype gender-neutral restrooms (Sanders and Stryker 2016; Sanders 2017a, 2017b, 2018; pers. comm., November 7, 2017). Student groups and emerging practitioners have also expanded discussions held in schools to the public sphere. For example, QSPACE (2016)—which emerged from QSAPP at Columbia University’s Graduate School of Architecture, Planning and Preservation—has engaged public education to discuss the biopolitical framing of gender and sexuality in everyday spaces, such as thinking about homeless youth (pers. comm., June 16, 2017).

2. BROADENING OUR IMPACT

The strategies presented challenge normative assumptions that are rarely acknowledged in architecture. They contribute to making architecture and design education—and by extension, eventually the disciplines—more inclusive and knowledgeable about people and communities that are constantly being Othered by overwhelmingly represented majorities. Furthermore, they suggest a need for coalition building, recognizing both the differences and the communalities between different identities, between different disciplines.

In her call for a queer pedagogy, Britzman (1995, 152) notes that “the questions I raise about the possibility of articulating pedagogies that call into question the conceptual geography of normalization . . . require something larger than simply an acknowledgment of gay and lesbian subjects in educational studies. At the very least, what is required is an ethical project that begins to engage difference as the grounds of politicality and community.” The discipline of architecture (and its education) is still very much shaped by a desire for a single rational truth—exemplified by the focus on developing oral and visual strategies to “convince” someone of the quality of a project—that does not address the diversity of lived experiences. In my own experience teaching about diversity and design, I’ve had students challenge racialized or trans people’s claims for changes to the built environment; they argued, for example, that trans people’s requests for gender-neutral restrooms or the lasting impact of redlining were not based in any “empirical evidence.” When asked how the interview-based research they had to read or the numerous claims presented in media did not represent empirical evidence of the need to rethink public restrooms, some of the students argued that this evidence did not fit with a “truth” that could be shared by everyone in pursuit of a greater good in design. While not necessarily surprising, this again underlines the framework that shapes most design schools. The impulse is to aim for universalizing, normalcy-seeking solutions that let students—and later professionals—talk about “the public good” without realizing that there is a difference between their understanding of an issue and how users live this issue. Designing for diversity does not mean designing for diverse people; it means helping diverse people design for themselves.²

Architecture students’ reactions to discussions of gender and sexuality—and more broadly of identity-based issues—suggest a potential for seldom explored design pedagogies. In the late 1990s, Megan Boler (1999, 177) developed the idea of a pedagogy of discomfort to challenge how racism and sexism combine with “enlightened” thought and education structures by controlling emotion to maintain various forms of injustice. Her pedagogy of

discomfort is both an invitation to use critical inquiry to help students better understand the ways “emotions define how and what one chooses to see, and conversely, not to see” and a call to expose students to the willingness to voluntarily ignore the impact of beliefs we inherited.

For Boler, this did not mean that teachers should seek to change students’ beliefs, but instead that they should challenge students to question their beliefs and emotional attachments to those beliefs to understand how their experience and values are shaped by social, cultural, and political contexts. As Boler (1999, 176) acknowledges, self-reflection often leads to strong emotional resistance—that is, discomfort—linked to “fears of losing [one’s] personal and cultural identities.” In a pedagogy of discomfort framework, teachers should encourage students to explore why they are feeling these emotions in relation to their beliefs. While some design pedagogies already encourage students to self-reflect, those reflections seldom address students’ emotional reactions to the project’s objectives, users’ life experiences, or their own experience of the topic explored. Students are too often taught to approach projects as neutral containers and their role as one of an outside observer coming to help shape the spatial needs of users, but the life experience of minoritized designers—and thus students—often conflicts with this status, sometimes with important personal impacts. However, changing this requires work to challenge long-ingrained pedagogical methods, particularly in studio settings. Educators feel great risks when doing so and do not always receive the support needed from colleagues and administrators. In that sense, a pedagogy of discomfort can be uneasy for students but also for instructors, raising the question of how we can productively navigate those risks, coming from both colleagues and students, so that we can broadly transform the way we design and discuss architecture.

Furthermore, in addition to students working together and preparing for more collaborative and inclusive practices, cross-disciplinary collaboration between teachers can create opportunities for coalition building, particularly in contexts where a limited number of faculty are explicitly discussing race, gender, disability, class, sexuality, or ethnicity in their teaching. Faculty members with diverse individual self-identifications can multiply their impact by working together to tackle the intersecting ways in which minoritized experiences are marginalized from mainstream architecture discourses and education. They can also foreground their combined experiences as positive role models to create constructive learning environments to address these issues. Cross-disciplinary practices in architecture are still disruptive, challenging the generalist and universalizing discourses that sustain much of architectural education.

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¹ Interviewees were chosen through an extensive literature review to identify a first series of educators who were then asked to suggest further names. Most interviewees, but not all, were native English speakers. Efforts were made to reach outside the Anglo-Saxon and Western spheres, but cultural and political contexts—including the institutional invisibility and repression of sexual diversity in many parts of the world—have meant that the topic has been absent from architectural discussions in many regions of world. For example, there is still almost no discussion of queer issues in French-speaking architectural theory and history.

² The Center for Urban Pedagogy and the Equity Collective (2015) created a short comic to address this issue. Here again, I witnessed pushbacks from some students and professionals in reaction to the the comic's challenge to assumptions about what is understood as community engagement.

“DO NOT TRY TO REMEMBER”: PEDAGOGY IN TRANSITION

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Let's break it down. What are the underlying assumptions of our current architecture program curricula? Is NAAB the dog wagging the program tail, or are we borrowing piecemeal from previous generations of pedagogues? More importantly, what are our pedagogy biases? Are design skills naturalized or learned? What should twenty-first-century architecture programs include to address professional education and practice? What models of education or curricula would you propose? One familiar trope is the perception of the architect as a generalist, but this emerged from the Vitruvian model and is (almost) two millennia out of date. Vitruvius's first-century text, *The Ten Books on Architecture*, arguably still informs the underlying intellectual structure of the education of the architect, but the educational context of Vitruvius's text lacked institutional or professional bearings. Universities and professional offices didn't exist in Augustinian Rome. In contrast, texts like the 1996 Boyer Report are a product of the modern research university indebted to the *liberal artes*, or “free arts,” model, which is divided between (1) knowledge for knowledge's sake and (2) knowledge about how things are made.

The papers in this session looked at the epistemology of our discipline. We wanted to know what an architectural education could or should be in the twenty-first century. We hoped papers would challenge, validate, analyze, critique, or invent new curricula for the professional education of an architect. The conference was held in person pre-COVID. Now, in what seems a different era, some of the modes of delivery discussed in these papers, which at the time seemed novel, are commonplace. However, this does not lessen the challenges of how content is informed by our modalities of delivery.

Jonathan Scelsa focuses our attention on possibilities beyond the static critique and suggests engaging with new media practices for an action-oriented interface with our representational schema. This prepares students for the profession but optimally also informs the decision spaces in the design process. Seung Ra makes a similar argument for using embedded computer technology to create a visual platform for interactions between users, including community stakeholders. His case studies are urban and suggest that multifaceted digital media, when fully engaged in the process, not only improve design outcomes but make better designers. Pedagogy in design is extended by both Robert Brackett and Oswald Jenewein, but where Jenewein calls for a structural format change integrating the studio, seminar, and study abroad experience to address “wicked” problems, Brackett targets integrating computational thinking as opposed to digital drawing into the studio so as to position our students to define the parameters of automation and challenge the confines of our current software programs and their complicity in the kinds of

architecture we produce.

Finally, Massimo Santanicchia and Ole Fischer link architecture education and ethics. Santanicchia acknowledges that architecture education should teach students how to consider design decisions within the space of ethical operations in practice. Fischer argues that ethics is proactive as an “acting in public,” a reference he owes to Hannah Arendt’s call for technical artists who operate outside of the politics of labor in a dialectic with society, culture, and technology. Unlike Vitruvius, who gave us an outline of the *activities* of architecture, or Boyer, whose argument positioned architecture at the borderline between a humanist and a professional activity, these authors make a strong claim for architecture education as a professional education that acts responsibly and is informed by computational and data-driven design spaces. Elaine Scarry argues that beauty “is an inclusive affirmation of the ongoingness of existence, and of one’s own responsibility for the continuity of existence.”¹ Acting responsibly cannot be decoupled, in any profession, from the objects of making. Perhaps this is one of the tenets we owe to our planet, its resources, and ourselves in the twenty-first century.

Note: You may view a selection of “Do Not Try to Remember: Pedagogy in Transition” paper presentations online here: https://youtu.be/qLttL907s_w

Session Papers

- p. 63** "Reviewing Digital—Critiquing the Static Crit" (Jonathan Scelsa, Pratt Institute)
- p. 71** "Doing the Right Things" (Seung Ra, Oklahoma State University)
- p. 81** "Architecture Revisits Math & Science: Computation in a Visual Thinking Pedagogy" (Robert Brackett, Pratt Institute)
- p. 97** "Architecture in the Anthropocene: Toward an Ecological Pedagogy of Parts and Relationships" (Oswald Jenewein, University of Texas at Arlington)
- p. 106** "Architecture Education for World Citizenship" (Massimo Santanicchia, University of Iceland & Iceland University of the Arts)
- p. 114** "Design Research Methods—Applied Theory and Studio" (Ole W. Fischer, University of Utah)

Not all authors submitted papers for inclusion in the conference proceedings; below are additional papers accepted into this session.

"A Template for a Speculative Pedagogy" (Ellen Donnelly, University of Nebraska—Lincoln, and Marc Maxey, University of Nebraska—Lincoln)

"Computational Literacy: A Pedagogical Framework for 21st Century Making and Thinking" (Nick Senske, Iowa State University)

"Pedagogy in the Wild: A Field Guide to Contemporary Architectural Education" (Bradley Horn, The City College of New York)

¹ Elaine Scarry, *On Beauty and Being Just* (Princeton, NJ: Princeton University Press, 1999), 92, <https://doi.org/10.2307/j.ctt28557b>.

REVIEWING DIGITAL—CRITIQUING THE STATIC CRIT

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ABSTRACT

This paper focuses on challenging design pedagogy to question its ingrained reviewing methods that require the production of static media. This examination looks at new methods of digital design practice that allow a student to both design and quickly output a digitally interactive version of their model for impactful means of collaboration by faculty of all ages as well as other students. Topics covered include the space of digital review, how architectural academia can harness new social media culture, and core concepts surrounding the technologies of information.

Keywords: Pinup Culture, The GIF, Digital Pedagogy

1. INTRODUCTION

In design education, a common aphorism relayed to the beginning design student during reviews is “You put all this work into your digital model, and it doesn’t show up on these drawings.” The educator is lamenting over the amount of design-thinking and time spent in a medium that did not see the light of day in a public forum. A corollary statement that might be heard earlier in the semester would be “You need to get your design out of that digital model onto paper and pin it to the wall so that we can discuss the design.” From the student’s point of view, particularly the twenty-first-century digital native who streams videos and posts and shares content all entirely from a small computer in their pocket, one could imagine that the above criticisms are accepted due to the student’s novice status, but also raise a level of frustration, anxiety, and incredulity. Further, advances in software development and the inverse relationship between increasing hardware performance and decreasing costs stir the inquiry that perhaps it is our review format with students that truly needs to be revisited. From the faculty’s point of view, these statements are supported by the historical discussion point revolving around practice, wherein the printed 2D realm was the format of action for both presentation and construction. This remained a truism through the twentieth century, when presentations to clients occurred through either static slide presentations of images or static drawings pinned to the wall. The construction set would be tantamount to “a truck for pushing ideas from place to place” (Evans 1986, 186), that is, a contract for translating information from one party to another.

1.1 Reviewing Information

These twentieth-century formats, while different in presentation medium—some using a screen and others using print material—share the common challenge of forcing a designer to switch from generation of a design into a pursuit of representing the design. An example of

this moment would be the night before a student’s critical review, when the designer switches from “digital modeling,” wherein they are working with a live image representation of three-dimensional information to a more “presentable” format, for example, a static image typically presented as an orthographic line drawing or one performed by a heliographic ray-tracing calculation within a render engine (Figure 1).

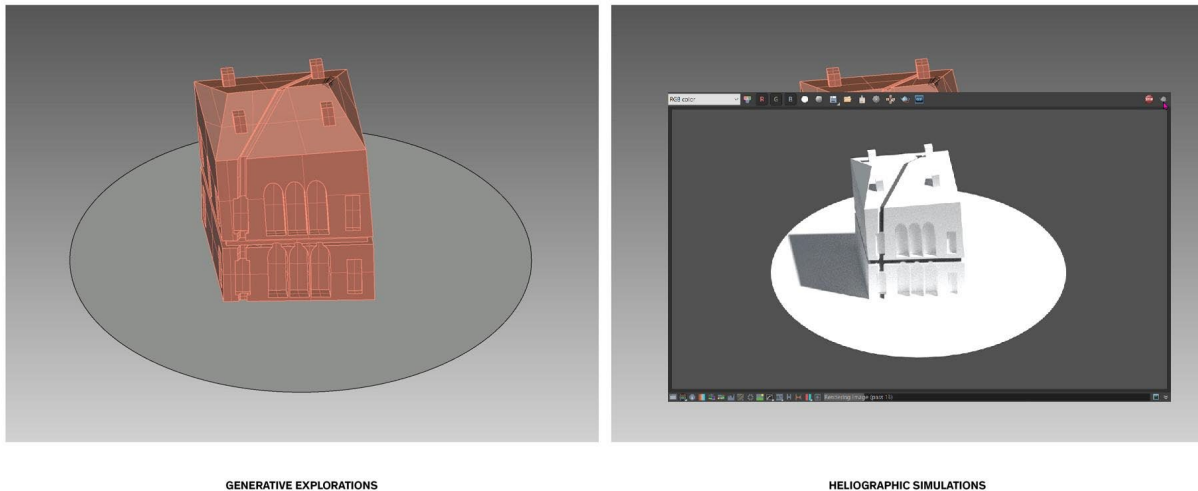


Figure 1: Heliographic comparison (Jonathan A. Scelsa)

Over the past ten years, the introduction of new technology for presentation mediums and translation formats rendered this argument antiquated based on how information is managed and translated. Formats such as virtual reality present the possibility of exploring a virtual model in the same dimension as the one in which it is being constructed. Similarly, the deployment of the parametric Building Information Modeling (BIM) system demonstrated live participation by multiple parties on one informational model. Increasingly we are witnessing the construction industry working directly from the three-dimensional informational model, forgoing the need or desire for printed material and suggesting the collapse between generative information and technical production. First and most obviously, this is a marked change from two-dimensional to three-dimensional representation, a point laboriously credited during the digital upheaval. The second and perhaps more important point is that this is a change from static artifact-based media to live information-based media.

John May, in his article “Everything Is Already an Image,” points out that “the world of the orthographer was simultaneously a text and a drawing, the world of the post orthographer is simultaneously an image and a model—an electrical image and an electrical model” (2017, 12). May’s argument calls attention to the concept that designers are always developing information and that there are “no pre-technical forms of thought” (2017, 12). So, in a literal sense, we might ask why, as faculty, do we constantly ask students to stop the generative procedure to produce static modes of representation, when we are increasingly witnessing the profession move toward live informational presentations. Beyond the transfer of medium, it is also notable that recent hardware and software advances have offered some subtle potentials for flattening the translation process. While computers have natively been

capable of real-time updates to two-dimensional graphics since the earlier part of this century, it is only through recent advances in affordable graphic processing units or “video cards” that real-time rendering in the third dimension has been facilitated. Designers now have the capability to simulate light and pen effects simultaneous to the design process, flattening the time between design and presentation.

1.2 Reformatting Pinup Practices

Literature on architectural education informs us that studios need to employ multiple types and formats of feedback. Commonly used formats in static paper-based architectural education might include: the one-on-one critique between a faculty and a student commonly referred to as a desk-crit; small group critiques, wherein a faculty gathers a few classmates together and reviews their work over a table-top setting; and of course, the canonic pinup or review, wherein the entirety of the studio assembles in one space to pinup the work and review students in either groups or individuals. The reasoning on alternating between these pinup routines is manifold. First, students learn in different ways; while some require more intimate feedback particular to their project, others learn quicker by seeing how colleagues react to similar problems. Second, this creates a syncopation of the monotony of the day-to-day routine, allowing students micro-incentive-based deadlines along the way.

Yeonjoo Oh et al. comment on this tendency in the essay “A Theoretical Framework of Design Critiquing in Architecture Studios,” wherein they write:

Group Crits are especially appropriate for introductory design studios. They are valuable for students with little design experience because they expose students to multiple solutions to the same problem. Compared to larger review groups, crits tend to engage new students who may lack confidence to speak in a larger and more public session. Students can participate more actively in the discussion because of the smaller group size and informal setting. (Oh et al. 2013, 306)

The challenge becomes how to migrate these types of knowledge and strategies into a new era of students working in new ways and expecting to present in new ways within the design and architectural workforce. One of the pitfalls that digital architecture has yielded is the interaction between faculty and student in an individual context. The computer, as a device brought into the studio setting by the student, often involving significant personal investment, does not share the same disposability as trace paper, which served as a shared space between faculty and student. The digital model, more akin to a physical model, may be one that is spun and rotated, but this alone is problematic when done day in and day out in a desk critique setting. The digital desk critique itself could learn from strategies of old where students were asked to bring multiple mediums and formats of drawings for discussion on a table-top setting.

A switchover to exclusively one format of digital production can also appear to students as if they are chasing the new wave of one technology, as evidenced by the sarcastic fifth-year student in a school not to be named, when they were asked to create another GIF of one hundred stacking bricks. The challenge is to bring in these new methods and tools in a varied and meaningful way, not purely dynamism for novelty’s sake. I would argue that in the digital era we need to explore with students an equal range of types of formats for digital presentation. By alternating between prepared videos, short GIFs, narrated documentaries, slide decks, and analytic screen captures, we offer students a variety of ways to

communicate ideas that can remain as generative information longer, each establishing their own inherent learning outcomes and provoking different ideas of developing a project.

1.3 Incorporating New Media Practices

The projective GIF, by contrast, forces the designer and student to compress ideas into a controlled amount of space, balancing frame count, resolution, and color as a means of expressing a thought. As a media examination, the FlyThrough mp4 we might categorize as hot media, containing long information of walking down the street of a context before we find a building and thoroughly and exhaustively explore the interior following five minutes of decapitated panning. The GIF, on the other hand, has the requirement of being much cooler; like a television show that jokes about current events, it ties into that which you already know and becomes more equipped to comment on culture. The projective GIF uses the familiar or reproduction of the same with subtle changes, making it an expert tool of cultural critique as a form of projecting a new reality against the dirty realism of our image stream of the moment (Somol and Whiting 2010, 195).

Notably, while the GIF took hold of social media and architectural pedagogy within the past several years, it entered the fray during the period of the parametric, as a means of showing procedures and processes that were elastic by nature. Software such as CATIA, Digital Project, and Grasshopper all had built-in functionality to demonstrate how an algorithmic process could be flexed, pinched, and squished based on the manipulation of a few variables. The GIF, or quick animation, became the proof that the object in question was not merely a compositional product of a wunderkind but rather part of a larger system of making that could produce multiple offspring. The GIF in this procedural world became the systemic binder or the symbol of the flexible diagram. Process also in this manner can tell a narrative, a means of explaining how a design fits into a larger system rather than a mere explanation of its own being (Figure 2). These new systems allow video to be the better tool to evaluate changes in subtleties of color in thermal and other analysis procedures.

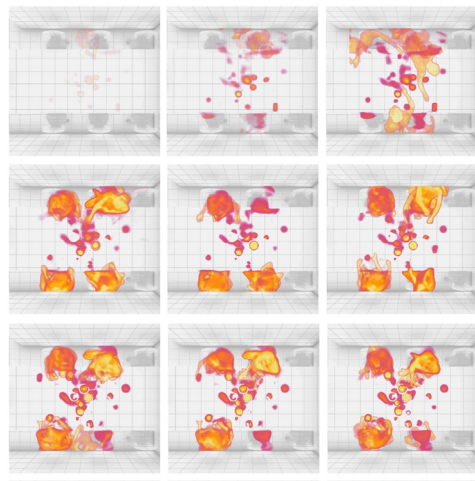


Figure 2: Thermal analysis of a space (Jonathan A. Scelsa)

The clipping plane GIF and rotating object GIFs are perhaps the most hotly criticized of the group, arguably because they have become ubiquitous and easy to produce, given the real-time rendered and ambient occluded environs that students now work within. Despite

their omnipresence, from a pedagogical standpoint, the clipping plane GIF provides a medium that is prerecorded and curated by a student but in a fashion that can be used quickly for discussion in group session without the labor of a massive video (Figure 2). When projected on a whiteboard, for example, this dynamic format commands the attention of a pinup group discussion with a model that is a work in progress. This working-session drawing type cuts down the time between production and presentation and retains the design process closest to its information standpoint.

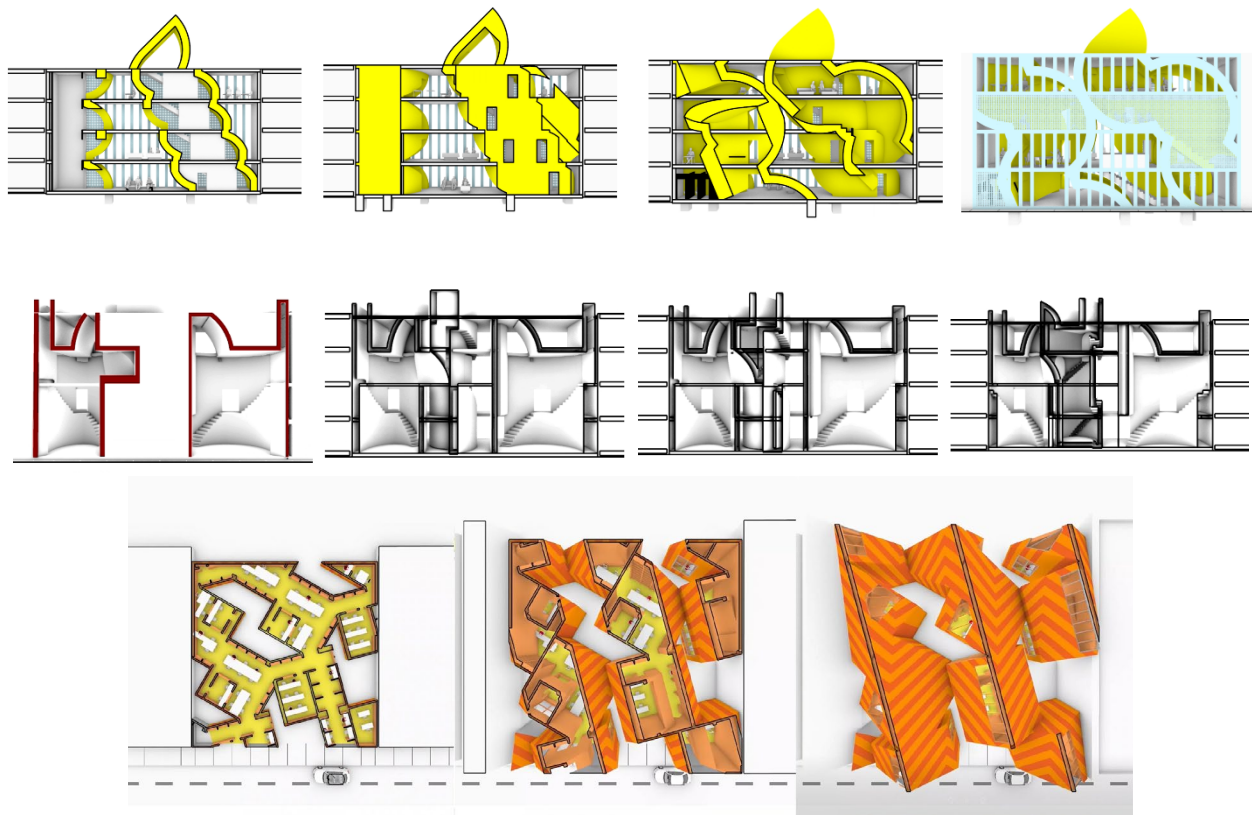


Figure 3: Clipping plane video demo (Jonathan A. Scelsa)

The analytic documentary provides students with a methodology for conducting and accumulating research about a topic, such as a site or precedent study, in a narrative fashion. Unlike a standard precedent study, which might be accompanied by a set of documentation, the prerecorded format asks students to sequence their thoughts in a way that controls the dialogue and output. Asking students to narrate the video, either through prerecorded embedded audio or speaking alongside the motion, engages them with the processes of storyboarding, wherein the videos become a series of ideas linked together rather than pure spectacle. The videos shown here demonstrate a precedent assignment in which a sophomore undergraduate decomposed a building into its prevailing structural logic, and a site analysis in which two students analyzed a site at multiple scales—the district, the larger park, and the building to which they were adapting it—all around a single concept. This

format allows students to continually adapt drawings while sequencing a story (Figure 4). All these formats can themselves be linked within a larger slide deck, an obvious idea to academics and professionals, but one often lost on young students. This act of assembling diagrams and content furthers the process of developing an argument and ideology in lieu of producing pure requirements, as it asks students how they want to speak about the project as much as represent it.



Figure 4: Analytic documentary (Ipek Battal)

1.4 New Spatial Requirements

Arguably, to facilitate a dynamic day-to-day rhythm, it is equally important to alter and change the spatial method for these routine examinations as much as it is to change the medium of the format. Not only do the variety of presentation techniques structure studio in a dynamic and nonstatic day-to-day rhythm, but changing the spatial notion for each of these routines creates a dynamic and nonstatic day-to-day routine that exposes students to the multiple pressures existent in everyday professional and academic practice. Moreover, examining the new digital presentation arena allows us to correct some of the potential pitfalls that normally are adopted in static one-on-one pinup pedagogy and to explore how other fields are incorporating presentation and digital spaces into their work culture.

At our home institution, we have begun experimenting with different spatial formats for examination as ways to avoid replicating the one-on-one pinup challenges. Deployment strategies have included multiple screens, large-format theater seating, and lounge settings. Multiple screens in a room allow for the comparative learning that is often the reason we use pinups in the first place. Students can examine how projects that differ perhaps in form can employ similar strategies (Figure 4). These photos are from a recent review of sophomore studio wherein students were asked to examine a set of precedents and adapt their sectional structural strategies into a new building system. Precedents were grouped by structural type, and the final projects were presented in these groups, allowing for a rich conversation to emerge between projects. Alternatively, the potential for a larger format gives students in a final review context the ability to command a large space. This sense of implicit respect also serves to turn the tables a bit on the reviewers by placing the student at the podium and having the reviewers form part of a spatial audience. The spatial format has the potential to turn the challenges of screen-based learning into a theatrical performance and an asset.



Figure 5: Digital review culture, second-year Pratt (Jonathan A. Scelsa)

2. CONCLUSIONS AND FUTURE WORK

The academy has a reputation for being slow to update its procedures while being fast to adopt progressive ideologies. As such, schools need to learn how best to harness their most resilient resource, the youth and energy of their clients. It is notable that our students' generation is far more conscious about the burgeoning climate crisis and energy discussions, a fact that became clear at the author's home institution when students presented statistical information concerning our paper consumption. Imagine the economic message the academy continually sends first-year architecture students by requiring the financially taxing purchase of a high-end computer capable of displaying and editing 3D video information, and then insisting that the content generated therein also needs to be consistently printed and plotted on expensive paper. Lastly, our academic bodies, particularly architecture, have emphasized the idea that design education can prepare students for a multiple array of working conditions in multiple fields. While the argument largely stems from architecture's inherent integrative and creative problem-solving thinking strategy, it may be argued that its methods need to be updated so that our thinking can be more readily applied to how the larger audience works and presents ideas. So maybe we should stop saying, "Don't show me your rhino model," and instead focus on new ways of using digital information in the action-oriented review setting for pedagogical discussion.

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DOING THE RIGHT THINGS

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ABSTRACT

In John Tabita's essay "Doing Things Right versus Doing the Right Things," he discusses two different approaches in the business management world: tactical thinking and strategic thinking. This opens up an interesting debate between creating the vision and implementing the vision. He offers a fair argument for both approaches. They are beneficial to tackling a problem and fundamental to success in business. Yet there is a critical tension between a tactical thinker who tends to "do things right" and a strategic thinker who is inclined to "do the right things."

"If you do something 'right,' but it is the wrong thing to do, your efforts will be futile. Conversely, if you do the 'right thing,' but you do it wrong, you will also fail miserably" (Tabita 2011, n.p.). How can we apply this inquiry to architectural pedagogy? The current model of architectural program curricula is based on the tactical approach, predominantly skill-based design education. Therefore, the measure of success in architectural pedagogy of NAAB-accredited programs tends to be solutions for tackling a design problem. While the tactical thinking process is needed and essential, how can we implement the strategic thinking process into our current architecture curricula to promote the idea of "Doing the Right Things"?

The research paper is rooted in an upper-division special topics course, Data-Driven Research Methods, and will showcase two projects. The first, Spatial Network Analysis for Oklahoma City Streetcar, is focused on the infrastructure of the streetcar and its effects on the urban environment. The second project, Interactive Podium, uses embedded computing technology to create a visual platform for interaction between users. By developing diverse perspectives of the research process, the architecture curricula can nurture an effective decision-making process and proactively seek the "right things."

Keywords: Design Thinking, Tactical Thinking, Strategic Thinking, and Decision-Making Process

1. INTRODUCTION

Design thinking and its application are widely used in business, innovative education, emerging technologies, and other design-intensive disciplines. Design thinking may have slightly different foci and viewpoints in these various areas, but they share many similarities and complementary aspects. In architecture and architectural education, we have followed a largely traditional process in solving the design problem and maintaining the procedural aspects of design thinking. These positions have traditionally perceived design thinking as a linear process that requires decision-making within a predestined frame. How can we embark on a richer design thinking process?

We tend to believe that our type of thinking must be superior. Nevertheless, regardless of whether you are a strategic or a tactical thinker, you must come to realize that both types are critical to success. When it comes to strategic versus tactical planning, it is easy to fall into either/or thinking; that is, either strategic thinking is better or tactical thinking is better. The terms “tactics” and “strategy” originated as military terminology. They are two terms that are often used interchangeably in numerous contexts. Strategy is defined as an overarching plan or set of goals. Changing strategies is not a small task; it can be done but not quickly.

On the other hand, tactics are the specific actions or steps you undertake to accomplish your strategy. To achieve your goals and accomplish your plans, we need to view both the micro and the macro perspectives and how both fit together (Farnam Street 2018). Strategic thinking focuses on creating the vision, which is typically crucial to aspects of leadership. In contrast, tactical thinking is positioned for management that effectively implements the vision for goals and plans. Therefore, strategy and tactics are complementary. Then, how are these thinking types implemented in architectural education, and can they help us redefine design thinking?

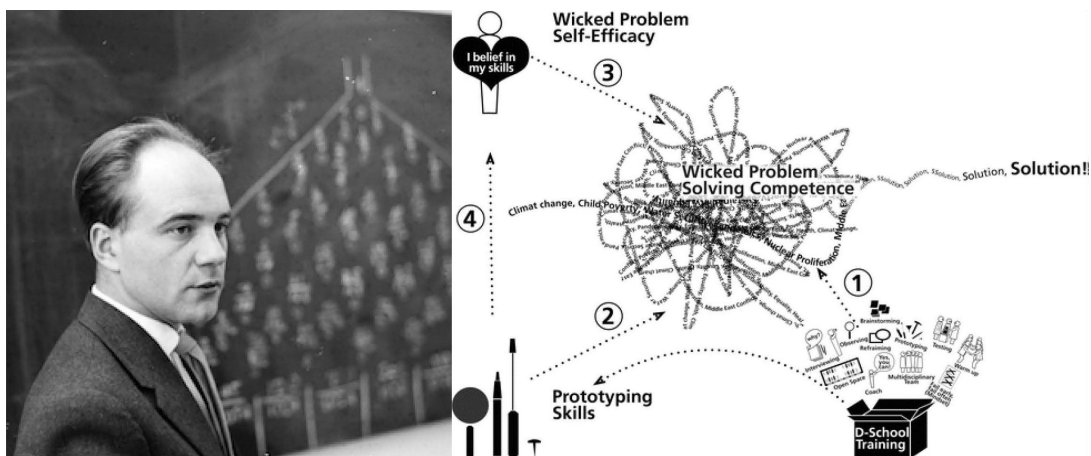


Figure 1: How prototyping helps solve wicked problems (Jobst and Meinel 2013)

In short, tactical thinking can be thought of as “doing things right,” while strategic thinking is “doing the right things.” Based on discussion between strategic and tactical thinkers, this research paper investigates how the design studio introduces the design thinking process via implementing tactical thinking and strategic thinking within studio projects and the overall framework of the studio. Design as a problem-solving endeavor has been the basis of studio education and NAAB’s student performance criteria. Its main focus is skill-based criteria, which puts a heavier emphasis on tactical training to achieve fundamental skill sets for conventional architects. It isn’t efficient to conduct any design studio while the students are lacking in skill sets. This works if it is a well-defined problem; conventional problem solving should be sufficient. But with this format, we overlook the uncertainty of future problems that we are frequently given: ill-defined problems, known as *wicked problems*. Horst Rittel, a design theorist known for coining the term “wicked problems,” described these in the mid-1960s as extremely complex and multidimensional problems (Rittel and Webber 1973) and wrote and spoke extensively about problem-solving in design (Figure 1).

Wicked problems are at the very heart of design thinking because it is precisely these complex and multidimensional problems that require a collaborative methodology that involves gaining a deep understanding of humans (Dam and Siang n.d.).

Perhaps not all design problems are *wicked*, and formulated decision-making processes are enough to maintain our domain of the design thinking process. But another question arises: why are successful businesses like Airbnb adapting design thinking as strategic thinking? In doing so, they explored not only the end users' experience, but also figured out how to iterate the solutions for future possibilities (Cross 2001, 49–55).

How can we teach and explore design thinking? In the history of design thinking, Buckminster Fuller aimed to create the “design science revolution,” incorporating rational thought with science and technology, with a focus on architecture and engineering. Design science, as a discipline, began to take shape in the 1960s in an effort to solve problems created by the rapid advancement of technology. Fuller called for this revolution to overcome the human and environmental problems that he believed could not be solved by politics and economics (Cross 2001, 49–55).

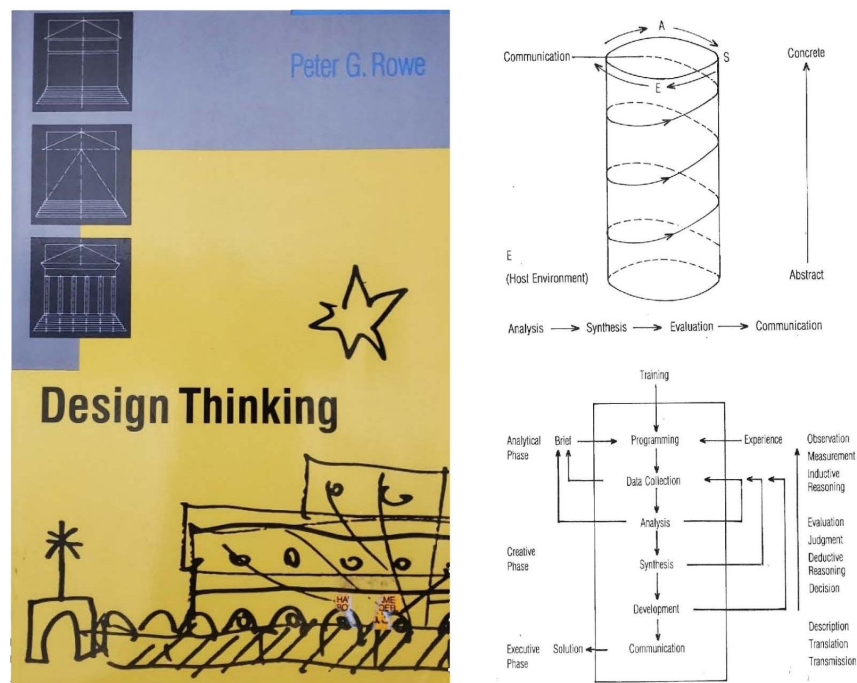


Figure 2: An iconic model of a design process (top right) and Archer's model of stages in a design process (bottom right) (Rowe 1987)

In the 1980s, Peter Rowe describes in his book *Design Thinking* that these problems have no definitive formulation but become fully defined through the design process (Figure 2). Additional questions feed a continuum of reformulation. There is no explicit basis for the termination of a problem-solving activity. His book *Design Thinking* provides procedures for solving problems as particular manifestations of an underlying structure of inquiry common to all designing. Rowe seeks to define the intellectual activity of designing both as rational inquiry, governed by guiding principles and constraints, and as a matter of the conviction and impulse by which design principles are invented and applied (Rowe 1987). Rowe

describes his work as “an attempt to fashion a generalized portrait of design thinking. A principal aim will be to account for the underlying structure and focus of inquiry directly associated with those rather private moments of ‘seeking out,’ on the part of designers, for the purpose of inventing or creating buildings and urban artifacts” (Dam and Siang n.d.).

1.1 Doing Things Right

This studio promoted design as a proactive, interactive, and intellectual activity of creating and making. As such, students were challenged to pursue a unique approach to design problems instead of following prescribed design processes. Providing a sequential project assignment emphasized the critical thinking process and encouraged them to develop an autonomous design methodology. This pedagogical approach conveys a unique opportunity for the expansion of the design thinking process through a rigorous investigation of making. To achieve this goal, the studio asks “What if?” instead of stating “This is.” This open-ended environment enhanced students’ learning experience and the development of tactical thinking.

First, the studio began the design exploration by investigating the concept of autonomy and the culture of reuse (Figure 3). In the article “Critical Architecture: Between Culture and Form,” Michael Hays describes the advantage of autonomous forms for reuse, noting the availability of their parts and processes to be recombined. As our culture strives to create things of lasting value and usefulness, we as designers must become masters in the art of transformation (Hays 1984). Students were challenged to generate autonomous forms to “discover” a new function. This argument for autonomy requires an alternative to the design thinking process. The multiplicity of possible architectural forms was contingent on the students’ research; they had no relationship to a preconceived function. The design process was shifted from a static functional exercise to a pathway of discovering new possibilities, from tectonic contingencies to the autonomy possible in figurative form making.

Through the design process of transformation, students generated their conceptual forms of exploration to “discover” a new design (and thinking) process. This encouraged thinking about how they could interpret and change the view to find a completely new form. As a nonlinear process, students worked through various studies, moving beyond a simple reapplication to transform their selection into an entirely new object. Any functional uses proposed derived from the unique forms created, thereby applying the mantra *function follows form*.



Figure 3: Autonomous Architectural Form (OSU School of Architecture ARCH3216_raSTUDIO)

After many initial studies, the project was developed and presented as a physical model and series of drawings in a portfolio format (Figure 4). This was followed by discussion about the development of chosen studies, speculating on a new function (or functions) for the object. Various dialogues were conducted: What might the new object look like in its new application(s)? Could it be applied at various scales for entirely different uses? In *The Function of Form*, Moussavi acknowledged that the function of structure explores the production of singular affects through systems that relate form and content and their capacity to produce a variety of forms. “The research presented aims to move architectural experiments away from [mechanistic] notions of systems for re-producing forms, to [mechanic] notions of systems that determine how parts of an architectural problem interrelate and multiply” (Moussavi 2009, 12).

In the second sequence of design assignments, we attempted to redefine the problem-solving process in design. This, organically, alludes to the practice of architecture as “problematic,” which is not correct and ultimately precarious. While a problem is an obstacle that involves doubt, uncertainty, and obscurity, it has inherited negative connotations that contradict the positive and prophetic nature of architecture. The question that remains is: if architecture is not solving problems, what is it accomplishing? The answer is: architecture answers questions! It is this simple. However, to answer a question properly and precisely, the question needs to be well stated and defined in every aspect. After investigating autonomous form and transformative design process, the studio challenged students to again envision the architectural form as an architectonic intervention. This suggests that architecture can interfere at one state of architectural being and cause a transformation that ultimately leads to a meaningful architectural interposition.



Figure 4: Autonomous Architectural Form (OSU School of Architecture ARCH3216_raSTUDIO and Emily Tran)

1.2 Doing the Right Things

This project is rooted in an upper-division special topics course, Data-Driven Research Methods. It showcases how strategic thinking is implemented and focused on creating the vision. The project, Spatial Network Analysis for Oklahoma City Streetcar, is focused on the infrastructure of the streetcar and its effects on the urban environment. Instead of being given a problem, the project is proactively seeking the problem, based in this case on Geographic Information System (GIS) data. In our problem seeking, we examined issues of accessibility, walkability, and pedestrian and vehicular movement by using computational analytic methods. The research understands the city via the flow of spatial data and its analysis applications. The research project simulated the growth of the city and analyzed it by looking at urban patterns. To identify the vision, several fundamental questions arose: In what ways do elements of urban form begin to affect an urban network? Are there other urban phenomena that contribute to forming an urban network?

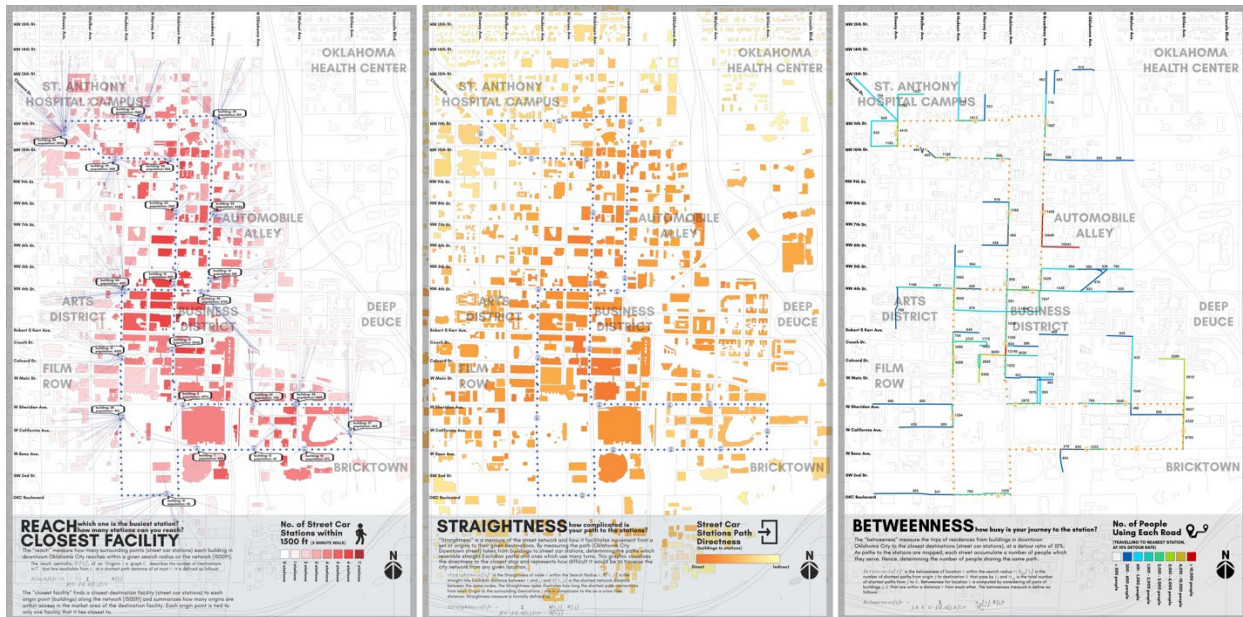


Figure 5: REACH/CLOSEST FACILITY ANALYSIS (Left): This diagram shows “Reach Analysis,” how many stops nearest users can reach from any given building, and “Closest Facility Analysis,” which measures the service area of each stop. STRAIGHTNESS (Middle): This diagram shows “Straightness” as an accessibility measurement, which represents how complicated a user’s path is to the nearest streetcar stop. Faded colors indicate several turns required to reach a user’s destination, which shows relationships between the coverage of the streetcar and the daytime working population. Most businesses and commercial destinations are within walking distance. Beyond the scale of commercial use areas, the streetcar seems to have little impact, compared to existing bus routes with more extensive and wider-reaching coverage areas. BETWEENNESS ANALYSIS (Right): This diagram shows “Betweenness Analysis,” which measures the congestion of each street. This diagram illustrates “How busy is your journey to the streetcar stops?” from users’ perspective. Also, it reveals how service areas can be more dispersed evenly across the cityscape and could serve greater population via future expansion.

(OSU School of Architecture ARCH4100 UNA by Seung Ra)

In cities where growth rate is rapid, transportation systems pose a challenge. How does spatial structuring of the city influence it? Is the analysis valuable? If so, why and who could benefit from its application? How could those factors begin to affect the analysis interpreted by the network analysis? Simultaneously, it established tangible information on how many surrounding destinations could be reached from the location within a given network radius, based on the types of destinations: transit, businesses, and residences. Three entities were used in the research reports: balancing different uses and the urban landscape, commuter flow and gravitational force, and socioeconomic dynamics. This simulation, Urban Topological Analysis and Accessibility, proposed ecological remediation of existing urban areas and reexamined the current course of urban renewal strategies for Oklahoma City Streetcar (Figure 5).



Figure 4: Autonomous Architectural Form
(OSU School of Architecture ARCH3216_raSTUDIO and Emily Tran)

1.3 Block Generative Modeling

As an example of the application of strategic thinking, urban form was investigated by reviewing selected areas within the streetcar route to see how the streetcar shapes and influences elements of a city block. We used a generative modeling tool, “DeCodingSpaces Toolbox for Grasshopper,” to look at the speculative quality of block development around southern portions of the city (DeCodingSpaces n.d.). Block Generative Modeling enabled us to study a speculative transformation of those areas directly adjacent to the streetcar. Utilizing computational urban analysis tools, we actively searched for various options of theoretical development of downtown OKC to see how we could maximize the streetcar and public transit to encourage development and improve mobility in the city (Figure 6). By doing so, we provided visions of how downtown OKC might grow into the future. This installment does not aim to provide extreme detail. It is strictly a general idea, based on the information provided by the OKC Planning Commission, our own knowledge of Oklahoma City, and software to thoroughly control and rapidly produce urban streets and masses. By manipulating block floor area ratio (FAR) and designated block heights, the project generated random results with control methods. We began by increasing the density of the

southern downtown area, as it is currently severely underdeveloped. The varying density with alternative zoning provides valuable clues to potential applications of these patterns to envision future development (Chakrabarti 2013, 34–87).

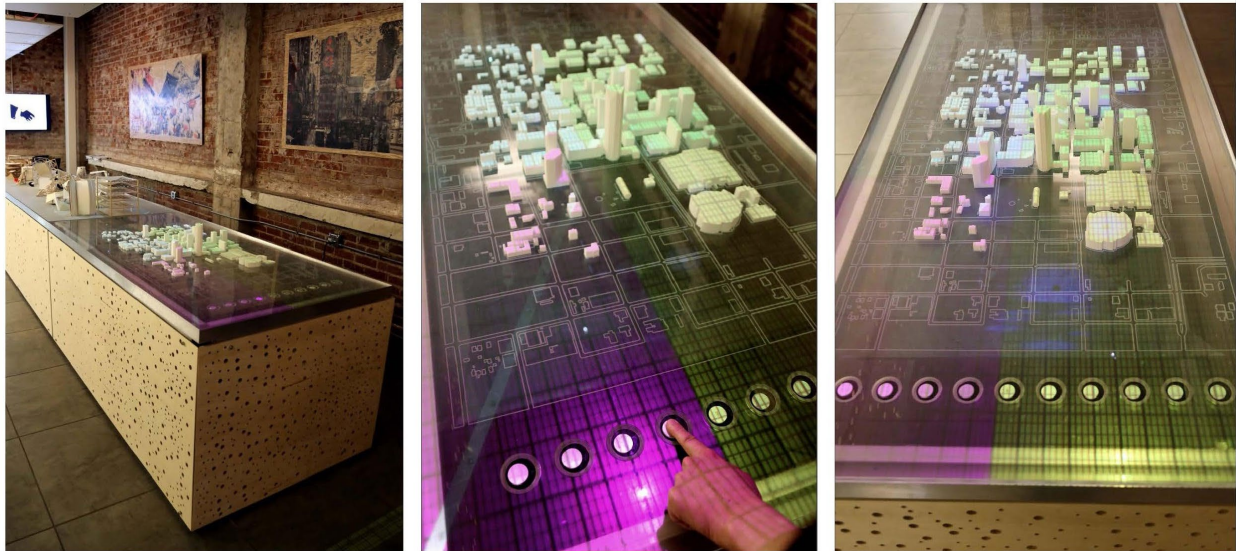


Figure 7: Interactive Podium (OSU School of Architecture ARCH4100 UNA by Seung Ra)

To explore broader solutions and achieve faster feedback, it is critical to design an effective way of interacting not only within the team but also with the community. In response to this need, the proposed research grant Interactive Podium was awarded by the Office of the Vice President for Research at Oklahoma State University (Figure 7). This project provided an interactive and responsive tool for mixed users (in this case, community members, architects, planners, and city officials). It also delivered an optimal solution for improving the communication methods, interactivity of the project team, and competent involvement of the community. Interactive Podium uses embedded computing technology to create a visual platform for interaction between users. By developing diverse perspectives of the research process, the architecture program curricula can nurture an effective decision-making process and proactively seek the “right things.” The outcome of the project was fabricated as a physical podium to visually communicate the design and decision-making process for experts and nonexpert stakeholders in the early stages of planning and design projects. The podium’s interactivity offers an effective teaching tool for a wide number of disciplines, from architecture, engineering, geography, interior design, urban economics, and beyond. Naturally, the project is an interdisciplinary research and teaching tool, allowing users to spatially visualize possibilities as well as graphically represent various data sets (Kirk 2019, 157–60, 332–34).

2. CONCLUSIONS

In conclusion, many architects and educators refer to architecture as a problem-solving process. This alludes to the practice of architecture as “problematic,” which is not correct and ultimately leads to limited solutions. Certainly, a problem is an obstacle that involves doubt, uncertainty, and obscurity, but architecture answers these challenges. However, to

answer a question properly and precisely, the question needs to be well stated and well defined. The focus of architectural education must be to cultivate more thought-provoking future designers. Architecture educators have discussed for quite some time how future generations will shape the position of the profession, weighing professional readiness. However, in uncertain times such as these, we are faced with many unknowns. By necessity we must continue to pioneer how we address the design process. Whether doing the right things or doing things right, architectural education also needs to evaluate where we stand and how we contribute to humanity.

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ARCHITECTURE REVISITS MATH AND SCIENCE: COMPUTATION IN A VISUAL THINKING PEDAGOGY

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1. ABSTRACT

This paper makes a case for the greater integration of computational logic and principles in core undergraduate architectural design courses as visual thinking pedagogy. Math and computation present abstract problems that may seem at odds with the real-world design concepts with which students are familiar. Because architecture students are typically strong visual thinkers, abstract mathematical language can be difficult to learn, but these concepts can be used as a pedagogical interface to support visual problem-solving in the design process. Building on the work of Christopher Alexander in *Notes on the Synthesis of Form* and *A Pattern Language*, the idea of “pattern languages” can be used to develop a curriculum that relies on math and computation to connect the visual and social systems at work in the design process. Design curricula can integrate computational thinking based on vector math, geometry, calculus, matrices, set theory, visual programming, and scripting to build students’ computational literacy through visual problem-solving. George Stiny’s “shape grammars” offer an intuitive analog method for introducing students to computational thinking through elements and rules in preparation for designing with digital tools.

The further we distance ourselves from the fundamental operations of mathematics and computation, the more we risk becoming obsolete in the process. Computer programs can automate modeling, analyzing, programming, reviewing, and even designing buildings. For now, that places the architect in a narrow domain of design and visual aesthetics, which will quickly be subsumed by machine algorithms deployed by software companies. These machine constructions operate at the social/cultural scale, a place suited for the critical position and service of architects. The education of an architect should therefore provide students with critical knowledge and skills that position them to define the parameters of automation and challenge the computer programmers with radical ideas, communicated in a shared language of mathematics that is both visual and abstract.

Keywords: Computational Thinking, Visual Thinking, Christopher Alexander, George Stiny, Rule-Based Systems, Shape Grammars, Pattern Language

2. INTRODUCTION

Computation and mathematics are the foundations of architecture's primary interfaces for thinking and communicating design. Drawing, modeling, rendering, analyzing, and constructing buildings rely on the integration of multiple fields of mathematics. If we distance ourselves from the fundamental operations of mathematics and computation in educating future architects, we risk becoming professionally obsolete, supplanted by computer algorithms that analyze site data to model building variations for population and environment simulations constructed from integrated construction catalogs. Design pedagogy can incorporate the rigor and structure of computational thinking into a visual thinking form-based design curriculum. By approaching design in 2D and 3D mediums as the definition and transformation of rule-based systems, formal variety and spatial expression are embedded with trackable design logic. Pratt Institute's first-year architectural design pedagogy builds from the abstract patterns written about by Christopher Alexander and the shape grammars of George Stiny to develop three specific trajectories in a B.Arch degree: (1) computation can be done visually with analog means that have digital corollaries for generating form and organizational systems of architecture; (2) building simple design skills and concepts step-by-step through a series of design exercises that present learning as a cycle of play, feedback, reflection, and integration that is not focused solely on fostering talent but rather on building individual competency through a flexible and accessible curriculum; (3) abstraction can be achieved visually in drawing and material systems that build on the foundation of two primary ways of designing, additive and subdivision systems, that can work as hybrid approaches to design architectural propositions. The education of an architect should provide critical knowledge and skills that empower one to define the parameters of automation and computerization. Architects must challenge the developers, engineers, and computer programmers with radical ideas communicated in a shared language of mathematics that is both visual and abstract. This paper aims to make a case for the greater integration of computational techniques, principles, theory, and logic in core undergraduate architectural pedagogies through visual thinking.

2.1 Math and Science in the Undergraduate Architecture Curriculum

What is the role and impact of math and science in the education of Bachelor of Architecture degree-seeking students in the twenty-first century? Reviewing the published curriculum tables for several National Architectural Accrediting Board (NAAB)-accredited art and design schools offering the Bachelor of Architecture and BFA degrees, such as Pratt Institute,¹ Massachusetts College of Art and Design (BFA),² California College of the Arts,³ Parson School of Design (BFA),⁴ Rhode Island School of Design,⁵ and The Cooper Union,⁶ reveals that there is a surprising lack of advanced math and science courses required of architecture students. The Cooper Union requires an Analytic Geometry and Calculus course, and Pratt offers Physics for Architects and Ecology for Architects, but no higher-level abstract mathematics, science, or computer science courses are required. This is similar in many smaller schools with an art and design focus. It is unclear to the author if this is a result of NAAB's dense curricular requirements for accreditation that rely on general education, a devaluing of math and science within the discipline, or a shift in focus from isolated courses to integrated learning, as many math and science subjects exist within the architecture curriculum. This void opens the potential for further research, as it suggests a potential gap in critical knowledge and skills required by twenty-first-century architecture students and

practitioners to address problems that cannot be solved by compositional design and organizational speculation alone. Architects will need to develop a strong foundation in mathematical concepts that provide an interface with emerging computational strategies for designing, documenting, organizing, representing, and manipulating the complex forces at work in contemporary architecture. One approach to address this is by integrating core concepts from individual math, science, and computer sources into the studio pedagogical model to engage the students with practical and visual translations of abstract concepts.

2.2 Pedagogical Questions for Core Design Studios

Managing complex systems is a fundamental aspect of architectural practice today, but how does a student learn to think systematically about these abstract problems? Architecture must engage with the analytical aspects of science as a model for establishing knowledge and resisting the embedded assumptions in the tools we utilize. Architecture students can learn from the rigorous formal structures of mathematics to build and manage complex knowledge with computation-based strategies. The first year of an undergraduate architecture education should be about developing fundamental abstract design principles that gradually build a foundation for structured intuition using the visual and systematic organization of form, material, and space. This suggests that architecture education must teach a balance between formal and intuitive thinking and that students can position themselves as designers by working at this critical juncture.

3. DESIGN AS ABSTRACT PATTERNS—DIAGRAMS AND THE MATHEMATICS OF FORM

The analysis of design problems is by no means obviously possible. There is a good deal of superstition among designers as to the deathly effect of analysis on their intuitions—with the unfortunate result that very few designers have tried to understand the process of design analytically. (Alexander 1964, 6)

Architecture can be thought of as an art of form, light, material, and culture, which could also be positioned as a science of geometries, physics, tectonics, environments, and systems. Architecture occupies a precarious territory that negotiates both our subjective experiences and objective control of our built environment. It forms the fabric of interaction and cooperation within our societies as well as the foundations of social and cultural practices. Buildings and cities (and the ideas embedded in their design) are visual and somatic experiences that give form to complex abstractions of spatial organization, movement, access, structure, material, environment, finances, and people. The overlap of these areas exists in the abstract patterns, or diagrams (Alexander 1964, Preface), that allow the quantitative to influence the qualitative, and vice versa, to produce a mathematics of form.

3.1 Christopher Alexander on Formal Design Systems

The dialogue between art and science, between intuition and logic, between form and function, has long been an ontological struggle of architecture. Christopher Alexander's seminal work on the design process, *Notes on the Synthesis of Form*, establishes a mode of design thinking that is critically responsive to this hybrid condition. Alexander defines the design process that considers both aesthetics and function, using a symbolic method that can be applied to specific problems and goals (Alexander 1964, 21). This is an initial positioning of design as a search through a space of possibilities accessible through a

formal process, connecting it to scientific fields such as physics, biology, and computer science. These fields offer a structure to the search process to fit form with context, defining a position from which to design that challenges architectural assumptions with data, logic, and fact (Alexander 1964, Appendix 2). This process allows for novelty and variety to emerge from complexity. Alexander also recognizes that the increasing complexity of design problems makes the use of trial and error prohibitive as a design process. Alexander sets the stage for the problem of design as an objective, self-conscious process:

Today functional problems are becoming less simple all the time. But designers rarely confess their inability to solve them. Instead, when a designer does not understand a problem clearly enough to find the order it really calls for, he falls back on some arbitrarily chosen formal order. The problem, because of its complexity, remains unsolved. (Alexander 1964, 1)

Alexander identifies the growing complexity in the modern design problem and looks to the formal systems of mathematics and scientific study as a method for developing future design thinking. Even in 1965, he was suggesting the integration of computation as a means for processing architectural design at the level of data, a far-removed abstraction from the sketch or compositional methods dominating since modernism emerged in the early twentieth century. The book defines a struggle to find a system that can provide a new way of thinking about design as an abstract process—one that includes analysis of part-to-part and part-to-whole relationships that can address problems of increasing complexity. Alexander (1964) works with mathematicians to develop rigorous formal systems based on graphs and probabilities, sets and matrices, and algebra and functions. A diagram is always at work in the definition and solution of the design problem, and some of the mathematical constructions begin to work diagrammatically to represent form and spatial organization in a drawing. The abstract diagram informs and resolves the mathematics of the equations into a visual format that provides the interface for communicating design as a representation of ideas and things.

3.2 Abstract Design Patterns

The idea of a diagram, or pattern, is very simple. It is an abstract pattern of physical relationships which resolves a small system of interacting and conflicting forces, and is independent of all other forces, and of all other possible diagrams. The idea that it is possible to create such abstract relationships one at a time, and to create designs which are whole by fusing these relationships—this amazingly simple idea is, for me, the most important discovery of the book. (Alexander 1964, Preface)

While Alexander later shared his strong reservations about the complicated symbolic process outlined in *Notes on the Synthesis of Form* (1964, Preface), he was able to synthesize the rigorous thought exercise of the book into his concepts of design patterns. This is a term (“Design Patterns” or “Architecture Patterns”) often used in computer programming to define schemas of computer code for common computation problems, akin to building codes or graphic standards in architecture (The Open Group n.d.). There have been several attempts to define universal design patterns for architecture. Vitruvius’s *Ten Books on Architecture* documents several design patterns from and for antiquity but shares

little with the conditions of contemporary urban technologies and design (Vitruvius 1960). Andrea Palladio's *Four Books on Architecture* and his subsequent body of work have inspired many contemporary designers and provide endless lecture slides. Palladio's design systems, specifically employed in his villas, introduced visual diagrams for designing plans and elements paired with written patterns for creating architecture (Palladio 2002). Le Corbusier's "Five Points" in *Towards a New Architecture* produced a new set of patterns for the twentieth century based on the technological and aesthetic developments of modernism (Le Corbusier 1985). Alexander's *A Pattern Language* was the next major evolution of his idea of the diagram, focusing on the abstraction and creation of patterns that could have a near-infinite recombinant structure to define a building design system. We could even look at these patterns (visual and descriptive diagrams) as architecture's version of pseudocode, a visual language for describing the abstract elements and relationships of a problem before the translation to software and hardware, or, in the case of architecture, drawings, models, and buildings.

3.3 Reflections on the Pedagogical Potential of Abstract Patterns

Alexander's (1964) work provides an interface between the slowly evolving process of vernacular design strategies (unself-conscious), the formal abstraction design principles of modernism, and an emerging territory of design research through formal systems and computation strategies (self-conscious). *Notes* presents a diagram of a village that resembles a tree graph but introduces an analytically and intuitively derived sketch of the ideal conditions of the problem (Alexander 1964, 153). While this may seem to drift back into a historically typological model of design, it offers an abstract structure for visually interfacing with decomposing and coordinating the elements of a design problem (Alexander 1964, Appendix 2). The dynamic dialogue between Alexander's unself-conscious and self-conscious design is further developed in *A Pattern Language*, where he analyzes and extracts design strategies, or patterns, as diagrams for implementing multiscalar architectural proposals that are simultaneously flexible and rigorous as an approach to formal, programmatic, structural, and social organization. He proposes an adaptable and complex way of developing the material spaces of architecture as an integrated whole, carefully considering the scale of each element (Alexander et al. 1977, xxxviii–xi). *A Pattern Language* also presents an approach to the social and cultural aspects of architectural design that provides critical guidance to students about the way we design for life, community, culture, and the future of the planet. Unfortunately, Alexander's diagrams are often analytically derived design patterns rooted in known conditions and require vast amounts of disciplinary knowledge to unpack and deploy. This makes them difficult material for teaching design, especially to students early in their architectural education. We should now ask the question, how can formal, creative, and visual design strategies be taught in a way that incorporates the rigor of mathematics and computation without the need to also be a mathematician or programmer?

4. SHAPE GRAMMARS—VISUAL THINKING AND COMPUTING

Alexander's diagrams provide visual representations of mathematical structures and historical contexts, but without significant historical knowledge of architecture, the diagrams do not provide a way of generating design. Another figure emerging from the dawn of the computer age to explore the relationship between math and design is George Stiny. His

2006 book, *Shape—Talking about Seeing and Doing*, documents Stiny’s work with shapes since the 1970s as an interface for visual thinking. His work on computing with shapes and shape grammars provides a direct and visual connection between mathematics and design (Stiny 2006, 58, 319–54). Stiny examines design and architecture from the perspective of a scientist and mathematician searching for an underlying language, or interface, to design that is formal but not symbolic while also producing creative visual results. He speculates on where creativity comes from: “Another one of my big questions is how to be creative in design. My guess is that shapes—drawing them and seeing them—have a lot to do with the answer” (Stiny 2006, 6).

Any element capable of operating as a bit with different states can be used to do analog computations (Tegmark 2017, 61–71), which means a shape in a drawing can operate computationally and generate complexity from simple rules. Abstract structures of mathematics, such as matrices, vector transformations, and schemas, can operate visually without a layer of separating symbols to give them meaning. Schemas of shapes and transformation rules produce interactive visual systems with organizational and tectonic consequences. Algebra, sets, and Boolean logic provide the underlying formal construction, but drawing opens the interface as a learnable and teachable pedagogical system (Stiny 2006, 159–310). The first computers were people calculating outcomes of mathematical formulas for tabulation, so why can’t we also calculate using shapes as visual elements interacting in a complex system to compute design outcomes? It is this calculating with shapes and further computing with schemas and rules that can define the overlap of design and math as a pedagogical interface.

Stiny presents four key metaphors about shapes that help bridge the gap between design and mathematics. He states that “(1) Design is Calculating; (2) Drawing is Calculating; (3) Design is Drawing; (4) Design is calculating when you don’t know what you’re going to see and do next” (Stiny 2006, 311–12). The last point is important, as both design and mathematics are a way to discover abstract structures and relationships that can have physical consequences in the world. Shape grammars can operate both analytically to understand designs of the past, and generatively to compute near limitless design possibilities. His work starts from the abstract visual system of thinking with shapes and works back into history to test the theories. Some of Stiny’s initial work focused on analyzing Palladio’s villas (1964) based on shape grammars (Stiny 2006, 341–54), which has led to further research and formalization of the process by Athanassios Economou and Thomas Grasl and Georgia Tech’s Shape Computation Lab.⁷ Palladio’s treatise on architecture has had a significant influence on contemporary design pedagogies through the popularization of people like Peter Eisenman,⁸ and shape grammars can help make the logic and spatial relationships accessible to any student who can draw and play in a visual medium.

Stiny’s ideas also build from and advance the tradition of composition and abstraction established with the Bauhaus and other modern architects. Shapes—point, line, plane, and volume—are still the primary elements of spatial exploration and description, but the shape grammar introduced by Stiny reduces the reliance on aesthetic composition and metaphors. Shapes provide an interface between computation and mathematics, between analysis and synthetic creation. Drawings and models become a computational medium. Seeing and doing are a method of calculating with things instead of symbols (Stiny 2006, 14–15). Related to Alexander’s extension of D’Arcy Thompson’s idea of design in *Notes on the Synthesis of Form*, shapes as forms are a living diagram of forces (Alexander 1964, 21).⁹

Shapes are geometry; shapes have spatial relationships; and shapes can become architectural form, organization, and structure.

I can calculate in design without saying much about designing. To begin with, I can analyze designs in a variety of ways. For example, I can look at their physical performance in mathematical models, or I can “rationalize” them—divide them up into components that I can manufacture and assemble. But analysis isn't the only use for calculating in design. I can be more synthetic. I can try functions or parametric representations to enhance my creativity. Equations define lines, curves, and surfaces that are used in pictures, buildings, and many other things that are admired today. (Stiny 2006, 13)

5. FORMAL SYSTEMS—PRATT ARCH 101 PEDAGOGY

The developments of Alexander’s and Stiny’s works provide the foundation of a pedagogy for teaching design in an open way that is not constrained by the rhetoric of the past and prepares students for the future of architecture as a visual and computational field with physical consequences. Pratt’s ARCH 101 syllabus states:

Architecture is an art of form and material—it is also a social product that participates in economic, political, and cultural contexts. There is a language of architecture lodged in the space of the drawing that utilizes geometry, and the same language of architecture can have agency in the world. Materials, technologies, and systems of architecture are tools through which we can design buildings and environments. This studio will introduce design approaches to architecture students by way of rule-based visual systems that will gradually lead to questions of material production and architecture as a mode of cultural production.

The primary pedagogical interface for developing visual thinking draws from Stiny’s shape grammars by teaching the students to develop systems as schemas of elements and rules created in analog layered drawings. This method’s intuitive, structured, and analytical recursive feedback loop helps students learn at their pace and with their strengths. Stiny states, “Whenever I put a pencil to paper, I’m calculating with shapes or symbols, but there’s nothing to code in a drawing, so I don’t have to use symbols in place of shapes to calculate” (Stiny 2006, 311). The geometry and construction of shapes as visual elements defined as collections of lines in a specific organization provides a syntax for visual thinking and designing. The propagation, manipulation, transformation, and organization of shapes through rule-based systems allows students to iteratively build complexity from simple elements (Stiny 2006, 194–95). We call these systems *Design Approaches*, and they are iterative, layered, resilient, and generally substrate independent, meaning they can operate in drawing or model, digital or analog, and at any scale. This independence from the medium is a crucial factor in a visual system’s ability to offer many design solutions at multiple scales as generative abstract systems (Alexander 1964, 135). From the foundation of visual elements and rules, we derive a pedagogy of design that can be taught systematically and with consistency, providing access to all students.

After completing several semesters under the initial shape grammars–based first-year pedagogy developed by Duks Koschitz (2013–18), we undertook a research and cataloging

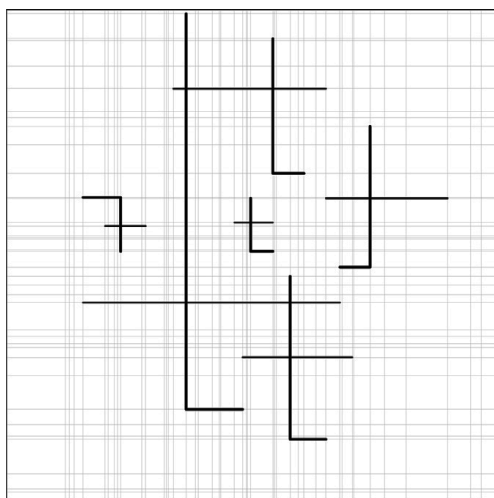
project to extract useful lessons from what the students were learning. From our observations, we developed an ARCH 100 Pedagogy Manual¹⁰ to clarify the Design Exercises and document the interface of teaching design as a formal and creative process. What follows is a brief description of the first-year design pedagogy based on computation through visual thinking. This system continued to run through 2019 and has now transitioned to a new coordinator with a different pedagogical model, though several successful aspects outlined below remain an active part of the curriculum.

5.1 Design as Visual Thinking—Additive and Subdivision Systems

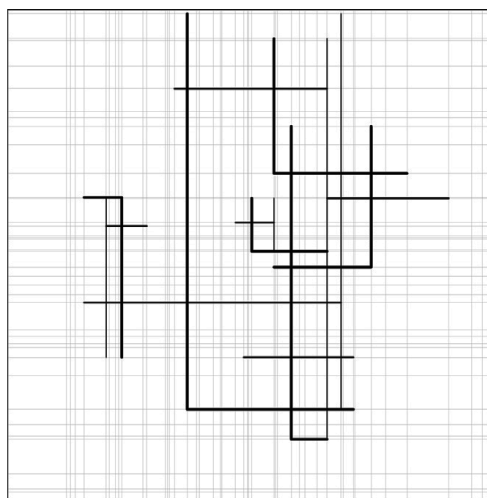
The semester is divided into three parts: (1) a dense six-week technique learning phase of Design Exercises, which increase in complexity but repeat common themes of adding parts and dividing wholes with shapes; (2) a one- to two-week midterm curation phase in which students analyze and reflect on what they are learning to organize their work into two Design Approaches that include 2D and 3D elements as coherent visual systems; and (3) a six-week final project during which they test their understanding of elements and rules as a way of designing a hybrid visual system as a proto-architectural proposal on an abstract site. During this process, students learn to frame and reframe their design decisions and strategies within the two primary contexts of additive and subdivision systems that work with shapes and rules.

Additive systems work directly with shapes and transformations to build complexity. Students work with many layers of vellum to design and calculate by seeing and doing. They also develop material translations (models) of their discoveries in drawings focused on the visual systems rather than representation. A shape is any group of points, lines, and/or planes and can change and adapt as the layers of the drawing develop. The results produce densely layered fields of visual systems with emergent and embedded forms for further exploration as spatial relationships. This is adapted from Stiny's schemas of shapes and rules, but the algebra and Boolean math are all handled through the direct interface with the drawing or model rather than at a high degree of symbolic abstraction. The outcomes are abstract, but the process of design is concrete and direct. The pedagogy is also rapidly iterative, and inquiry-based, as students are asked to perform written descriptions and formal analyses of their designs weekly.

The transformations that make rules work move shapes around, turn them over, and make them bigger and smaller. They're operations on shapes that change them into geometrically similar ones. They distribute over the Boolean operations, and may include, for example: Translation, Rotation, Reflection, Scale. (Stiny 2006, 194)

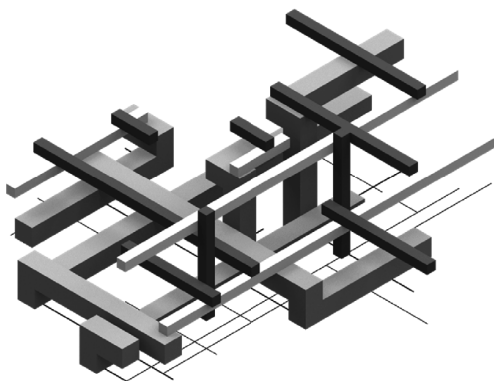


- Extract [L]-Shapes; Long stem Vertical
- Cross Vertical leg of [L] with a Horizontal line
- Flipping [T] Shapes



- Extend the Vertical leg of [L] Shapes
- Offset the Vertical leg of [L] Shapes to the internal end point of the [L]. Draw with a lighter line-weight

DE01



- 2-D shapes separated into three layers based on size (Small, Medium, Large)
- Resolve material conflicts by layering / stacking
- Make tectonic connections between shapes
- Cross link layers
- (rotation is a possible operation for depth)

On Shapes:

- Define shapes on visual terms:
[L-shapes, zig-zags, 7-shapes, U-shapes]
- Define shapes on procedural terms:
[draw line 3 space right, 7 space up or down]
[offset lines 3 spaces, connect 1 set of end pts]
- Shapes can be [all rotations] & [all mirrorings]

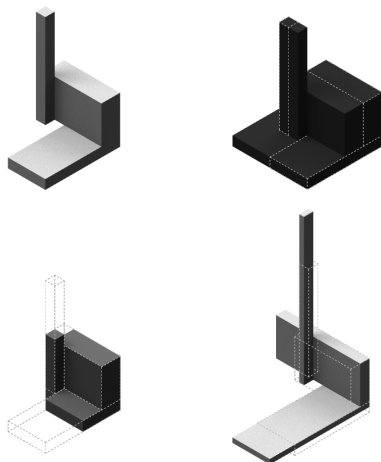


- Shapes Overlap at multiple scales
- Shapes are modified by the environment (grid)

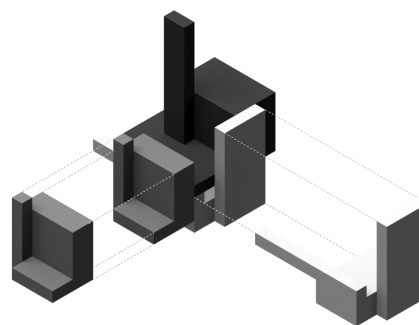
Adding Lines · Students are learning:

- to separate visual information onto layers
- to identify and create visual relationships
- to create part to whole relationships through the repetition of parts (elements)
- to identify characteristics of shapes (elements)
- to create variation by modifying a shape's (element's) characteristics (point & line)
- to draw with hierarchy through line-weight
- to develop rule based systems based on shapes (elements) made of points and lines within and environment (the grid)

Figure 1: ARCH 100 Pedagogy Manual—Additive Shapes Exercises (Robert Lee Brackett III)

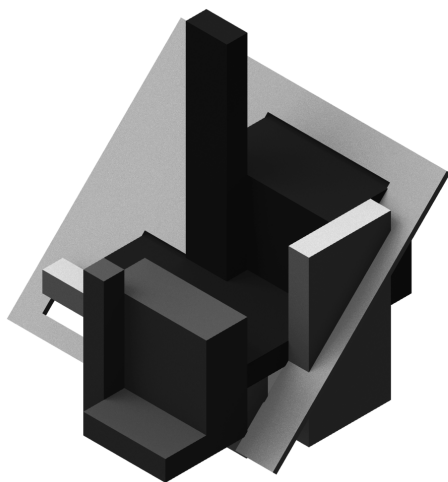


Base component of modular MDF extended into three variations by stretching and sliding

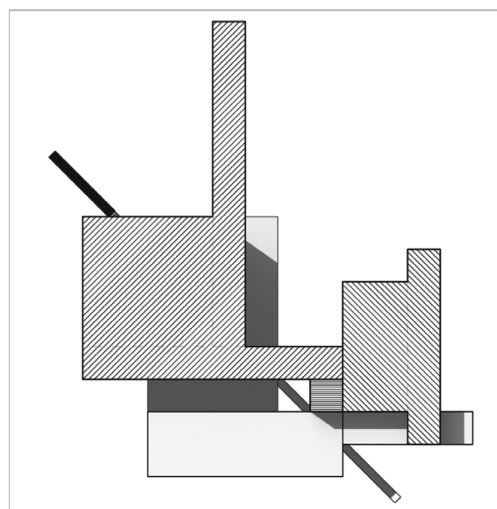


Exploring color and orientation for tectonic fit assembly

DE03



Aggregation interaction with plane proto-site. Object outline projected through plane from top view to create wrapped relationship



Section (including material difference and shadow projections optional)

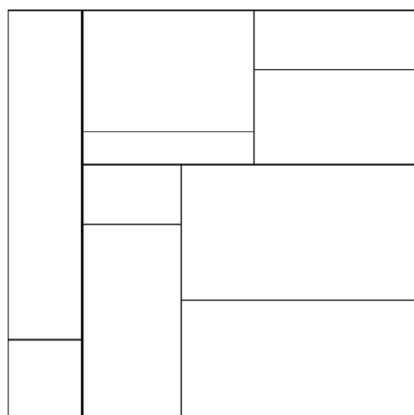
Figure 2: ARCH 100 Pedagogy Manual—Additive Volumes Exercise (Robert Lee Brackett III)

Subdivision systems operate differently from additive systems, with shapes forming from the relationships between closed regions subdivided into recursive parts. Again, layers of vellum are used to allow for rapid iteration and design development while seeing and doing. This is difficult to learn on a computer, where the shape elements lose their flexible visual relationships and transformational freedom. Computers turn the shapes into symbols, which impede direct visual manipulations as a way of thinking, but with practice, this can be learned. Shapes offer a visual interface to computing, since they can be translated into

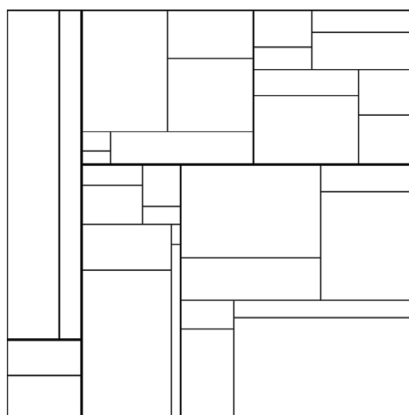
symbols for a computer. Stiny explores thinking and doing with the hands and eyes to learn creativity and develop a visual interface to the initial abstract schemas that define computational processes (2006, 6–8). We remain analog for these exercises because we are not teaching students how to write computer code, but how to think about design computationally. When we start to introduce more material tectonics, the boundary between additive and subdivision systems is challenged by the material translation. The artifacts of the process can become quite visually rich and rigorously controlled while still producing a high degree of variability and individual design research. These exercises derive from Stiny’s research into Chinese lattice designs, turning an analytical process into a synthetic process.

ARCH 101 - FALL

DESIGN EXERCISE 02 · DIVIDING THE SQUARE / CUBE

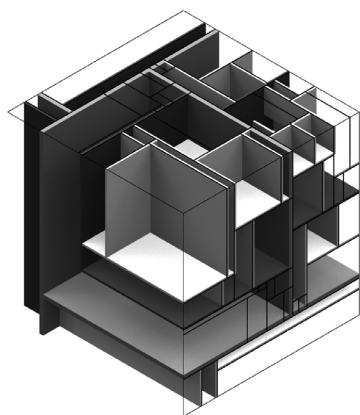


Fully subdivide regions with straight lines, off-center



Further iteration

DEF02



Heavy lines extrude through the cube space
Medium lines extrude to subdivide the new cuboids
Light lines further subdivide outer regions

The composition increases in density from lower-left to upper-right

On Subdivision:

- Lines must fully subdivide a shape into two new shapes
- Lines may jog or step to subdivide a shape
- The same rules operate at multiple scales
- Line-weight may describe sequence or boundary intensity

Dividing the Square / Cube · Students are learning:

- to disassemble a whole (cube) into parts (areas)
- to use different line thickness to distinguish hierarchy between lines
- to create densities with lines through subdivision

Adding to the Whole · Students are learning:

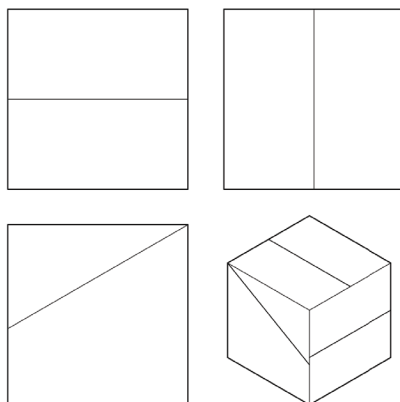
- to define a component by establishing the relations of its elements, planes
- to produce a new ‘whole’ by adding ‘parts’
- to create emphasis / hierarchy within a component
- to create emphasis / hierarchy within a complete assembly

Figure 3: ARCH 100 Pedagogy Manual—Subdivision Exercises (Robert Lee Brackett III)

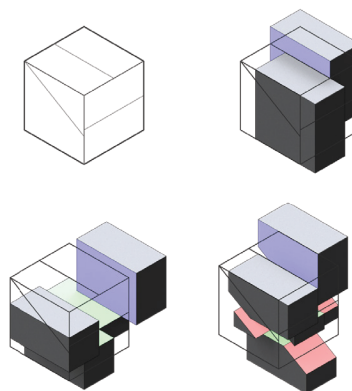
Each subdivision is made in the same way: attach an appropriately sized stick between two edges of a previously constructed triangle or quadrilateral or pentagon so that it does not cross previously inserted pieces. Each stage of the construction is stable; each stage follows the same rules. Indeed, the steps in the ice-ray lattice generation given in figure 5 could well comprise the frames in a motion picture of the artisan creating his design! (Stiny 1977, 97)

ARCH 101 - FALL

DESIGN EXERCISE 03 · CUTTING THE CUBE



Simplified lines projected from three sides through cube as cutting planes



Subdivision sequence expands the cube by sliding in two directions along cutting planes

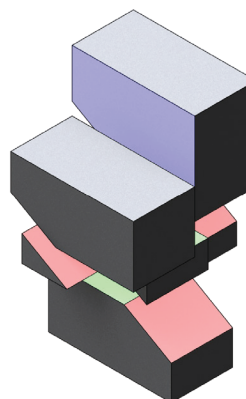
DE03

Adding Solids · Students are learning:

- to invent rules for working with modular material
- to develop component-component assembly rules
- to address the boundary of a cube through additive assemblage
- to explore how an object / assemblage interacts with a plane as proto-site
- to develop hierarchy between / with components by exploring color, scale, orientation, grouping, repetition
- to construct a measured hard-line section

Adding to the Whole · Students are learning:

- to consider the transformation from the original cube to the final cube through subdivision
- to work with voids as a formal design element
- to develop hierarchy between solid and void
- to work through iterative sketch models
- to construct a measured hard-line section



Expanded Solid void with color-coded cutting planes revealing interior relationships

9

Figure 4: ARCH 100 Pedagogy Manual—Dividing a Cube Exercise (Robert Lee Brackett III)

5.2 Design as Visual Thinking—Hybrid Design Approaches

The Design Exercises continue to introduce new fundamental principles of geometry, tectonics, organization, and ways of designing in 2D and 3D based on elements and rules. After the first eight weeks, a student should be able to define two Design Approaches as visual systems that operate via schemas of formal relationships generated by shapes and rules of transformation in 2D and 3D. The remainder of the semester is spent discovering and defining the interface between these two design approaches and testing the results as a proto-architecture of forms, space, and material. This pedagogical model further builds on Stiny’s investigation of thinking with shapes as a creative medium based on visual computation.

ARCH 101 - FALL

HYBRID CHARRETTE DRAWING

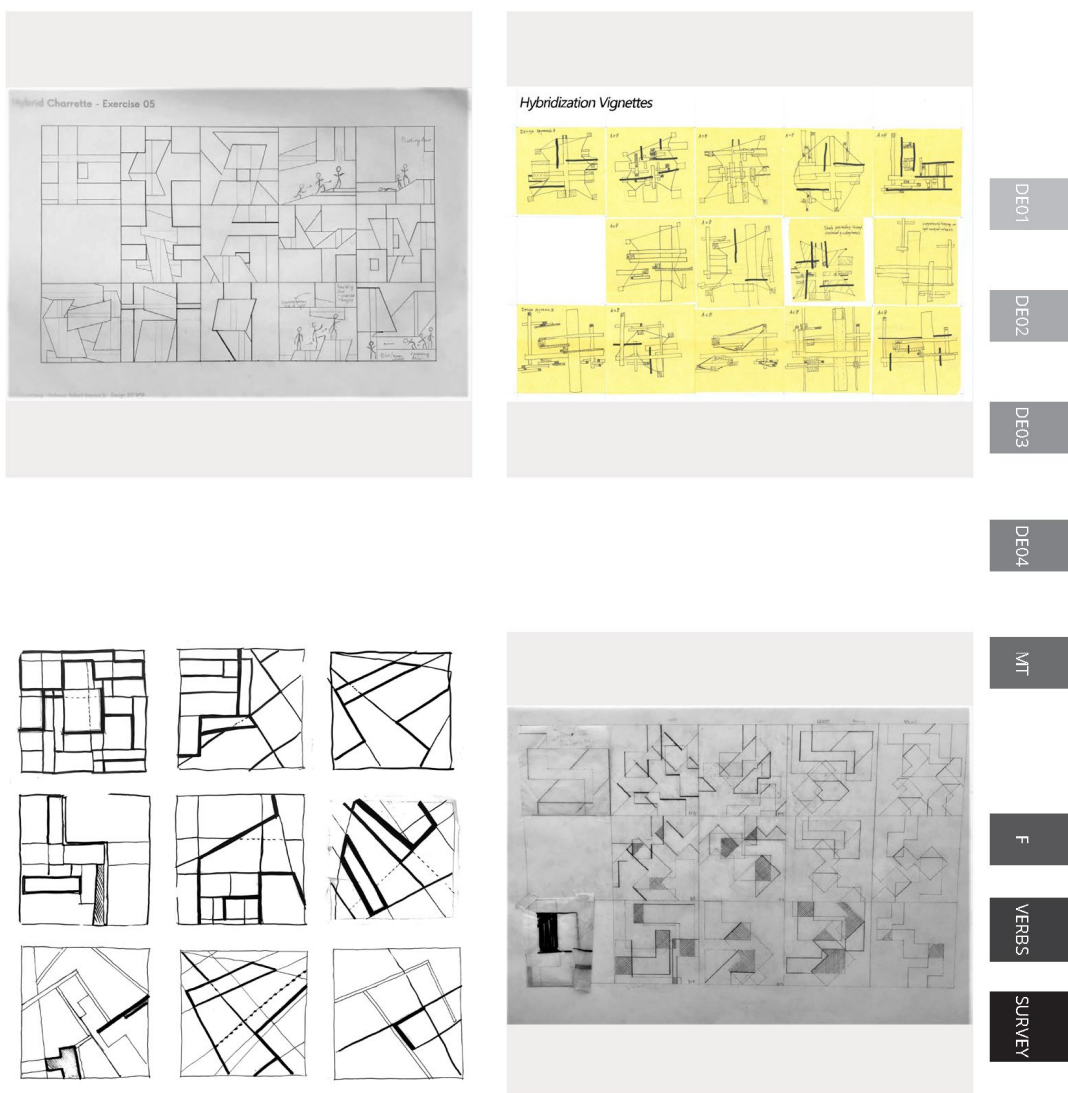


Figure 5: ARCH100 Pedagogy Manual—Hybrid Visual Systems (Robert Lee Brackett III)

There's creativity in combining shapes and in dividing them. But the one without the other is just reciting by rote, merely counting out. It's all memory when shapes are divided in advance, but otherwise, everything is always new. No one took any notice of this. Maybe the difference between sets and shapes in calculating—between identity and embedding—is too subtle. Or perhaps rigor and formality don't work. I'm less technical now, and as informal as I can be. The message is the same, and I don't want it to be missed. It's all about seeing—there are no units; shapes fuse and divide when I calculate. (Stiny 2006, 53)

This hybridization process is open and nonlinear. Because a visual system is interactive and defined with shapes and rules, the students explore multiple simultaneous methods for interfacing the design approaches in models and drawings. A drawing-based design charrette that rapidly forces the two systems to intersect, swap shapes and rules, and resolve complexity by searching for spatial relationships is an effective system for generating hybrids. This is performed in parallel with the creation of small sketch models that bring a tangible spatial dimension to the 2D drawing systems. Models are simultaneous translations from 2D to 3D with unique formal-material speculations that can inform 2D systems. Neither the drawings nor the models should be representational analogs to each other, but instead, discrete visual artifacts of a system at play. A challenge we have faced when onboarding new faculty is that they tend to treat the hybrid process as linear and continuous, which maintains high visual integrity but loses opportunities for invention. Here we can draw on the conclusions of Stiny as he states, “Shape grammars treat [shapes] as spatial objects; they require no special parsing of [shapes] into fixed [parts]. Spatial ambiguities are thus allowed, as given compositional units in [shapes] can be recombined and decomposed in different ways” (2006, 53).

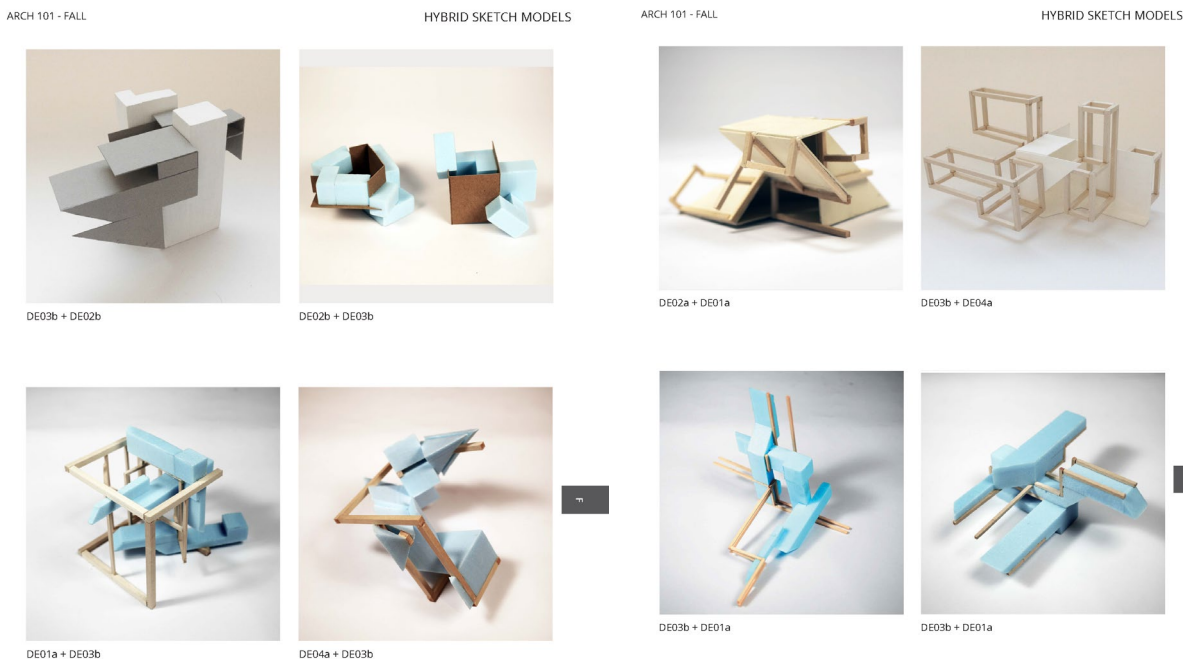


Figure 6: ARCH 100 Pedagogy Manual—Hybrid Models (Robert Lee Brackett III)

While the process may be open and full of ambiguity, the interface of elements and rules provides a rigor that allows students and faculty to access the design decisions within the project and incorporate feedback iteratively. Since the medium and material palette are limited, the results can be discussed in an objective framework while still offering a wide range of formal and aesthetic invention. This helps students play an active role in the design feedback process and better interpret the discussion of their work and the work of their peers. The proto-architectures remain abstract and malleable, yet highly controlled and specific. The lessons prepare students to integrate more complex architectural considerations within a computationally driven process as interrelated systems of form, space, structure, and site.

6. CONCLUSIONS AND FUTURE WORK

The pedagogical position presented here integrates key concepts from math and science, specifically concerning computation, at a first-year undergraduate level. Working from “shape grammars” composed by schemas of discrete shapes and rules, this pedagogical approach seeks to integrate computational thinking and formal systems of design discovery into the learning processes. In this approach, students learn to operate in a structured visual context, working toward rigorous systems through a responsive feedback loop of abstract drawings and models with their spatial consequences. Students are engaged in a process of feedback and reflection that treats design decisions as data points available for critical integration. This prepares students to engage more complex computational concepts during their studies using an analytical, process-driven approach. At the same time, students must understand how even objective representational systems are embedded with implicit social and cultural values that have real-world outcomes and that constitute a politics of space.

A new way of thinking about design as a scientific process that builds visual aesthetics on top of a formal structure of mathematical relationships emerged from the work of Christopher Alexander during the 1960s. The shift from analytical abstraction to abstract process opens new ways of thinking about design that integrate computational thinking with visual thinking. Methods such as George Stiny’s “shape grammars” offer a rigorous and accessible way to introduce undergraduate architecture students to core concepts of mathematics that support a field rapidly shifting from analog invention to a digital space of computation-based exploration. Teaching design as visual systems developed iteratively through the interaction of elements and rules shifts the evaluation of design work from a focus on preexisting talent to a system of rigorous and repeatable techniques layered with critical thinking. Design can be taught as a learnable set of skills rather than as something a person is naturally good or bad at based on previous experience. This helps individual students find their own design approaches that produce consistent and diverse outcomes leveraging the shared mediums of visual thinking and abstract systems. This approach to design thinking could be introduced earlier in the education process to help develop methods of learning and problem-based thinking that integrate math and science into design education.

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¹ Pratt Institute B. Arch, <https://www.pratt.edu/academics/architecture/ug-dept-architecture/arch-b-arch/>.

² Massachusetts College of Art and Design (MCAD) B.Arch, http://academic-catalog.massart.edu/content.php?filter%5B27%5D=EDAD&filter%5B29%5D=&filter%5Bcourse_type%5D=-1&filter%5Bkeyword%5D=&filter%5B32%5D=1&filter%5Bcpage%5D=1&cur_cat_oid=9&expand=&navoid=241&search_database=Filter&filter%5Bexact_match%5D=1#acalog_template_course_filter.

³ California College of Art B.Arch, <https://www.cca.edu/architecture/barch/#section-curriculum>.

⁴ Parsons BFA, <https://www.newschool.edu/parsons/bfa-architecture-design/?show=program-curriculum>.

⁵ Rhode Island School of Design B.Arch, <https://www.risd.edu/academics/architecture/undergraduate/>.

⁶ The Cooper Union B.Arch, <http://cooper.edu/architecture/curriculum/bachelor>.

⁷ https://shape.design.gatech.edu/Research/Projects/2018_Palladio/index.html.

⁸ This can be seen in Peter Eisenman's work in his exhibition and book *Palladio Virtuel*.

⁹ Alexander references D'Arcy Wentworth Thompson, *On Growth and Form*, 2nd ed. (Cambridge: Cambridge University Press, 1959), 16.

¹⁰ The ARCH 100 Pedagogy Manual was developed by Robert Lee Brackett III, Duks Koschitz, Tiffany Pun, and Mandy Xe in 2017–2018 as part of Pratt Institute's design research lab, Center for Design Research in Architecture (d.r.a.).

ARCHITECTURE IN THE ANTHROPOCENE: TOWARD AN ECOLOGICAL PEDAGOGY OF PARTS AND RELATIONSHIPS

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ABSTRACT

The impact of human activity on the global climate has started to cause physical repercussions that form, transform, and inform the natural and built environment. These repercussions have been materializing in a variety of ways, from sea level rise to wildfires, from health-threatening pollution to contamination of air, soil, and water. Architectural education in the age of climate crisis must tackle ecological challenges and respond to the impacts of global environmental change.

This paper uses three curricular components as a case study to demonstrate how architectural education may be able to address global challenges through the lens of ecology, showcasing (1) Design Studios, (2) Seminar Courses, and (3) International Initiatives. This methodological approach is strongly connected to a pedagogy based on flat hierarchies, personal engagement, and collective awareness of the individuals within a course environment. The content-based pedagogy around ecology becomes a guide for both architecture and architectural pedagogy. The aim is to provide students with an understanding of how the formal relationship between the (geometric) parts of space becomes an integral part of the emerging systems within the changing environment.

This paper also highlights the importance of travel components in contemporary architectural curricula, promoting a global-campus concept that is based on international academic and professional partnerships. Concrete examples of interdisciplinary and inter-university collaborations are provided to connect teaching components to research projects.

The paper concludes by relating teaching and research endeavors to the current transition of traditional architecture programs to STEM-affiliated disciplines.

Keywords: Ecological Design, Climate Crisis, Systems Thinking, Architectural Education, Global Campus

1. ECOLOGY AS A CONCEPT FOR DESIGN AND PEDAGOGY

In the age of climate crisis, the paradigm of ecological design in architecture and architectural education needs to be expanded from microscale approaches on the architectural object to a holistic understanding of the object as an interconnected part of the global ecosystem on the macro scale. While the generic properties of architecture are tempting designers in the digital age to apply similar solutions around the world, often disregarding the specifics of vernacular contexts, this paper stresses the importance of the phenomenon of place as the basis for ecological design. Place approached as “context of our existence” provides all the parameters to ground architecture in a specific field,

including the impacts of global and local phenomena like climate and weather, changing seasons, fauna, flora, light, materiality, and cultural habits (Norberg-Schulz 1979). Place and its formal morphology blur the boundary between natural and built context, as the face of the “given context” may be understood as natural or built, as an organism or assembled object growing on a surface. If natural and built context form a hybrid environment of manufactured interventions within the natural environment, one may perceive the impact of architecture through an ecological lens, focusing on the relationships between the built object, the living organisms that inhabit it, and their surrounding context.

Ecology, defined as “a single web of life” that focuses on the relationships between parts and the relationships between the parts and their surroundings (Hester 2006), is an excellent approach to both architecture and architectural education. The climate crisis is the single biggest challenge for humanity in the twenty-first century, demanding to overcome the boundary between design, technology, and biology. Within this complex (eco)system, architecture programs need to find a new identity reconnecting them to the properties of place and understanding architecture as an integral process rather than a static object.

1.1 The Changing Landscape of Architectural Education

Over the past one hundred years, the role of the architecture program has been in constant change: from Walter Gropius founding the Bauhaus in 1919; to the Royal Institute of British Architects (RIBA) conference on architectural education in Oxford in 1958; to the Boyer Report connecting architectural education, design, and research in the United States in 1996; to the Bologna Process in Europe of the late 1990s, declaring architecture to be a research discipline (European Association for Architectural Education 2019).

The role of the contemporary architecture program has once again been challenged, as many programs across the United States became STEM (Science, Technology, Engineering, Mathematics) fields in 2018. On the constant quest for architecture’s place within colleges and universities, STEM affiliation clearly demands a science- and research-based focus, expanding the discipline beyond its traditional creative focus aligned with the fine arts (Walsh 2019). Nevertheless, the role of a university asks any discipline to contribute to developing new knowledge aimed at finding solutions to current and future problems. The pedagogical landscape for (now) STEM-affiliated programs in the United States certainly restricts the artistic freedom of faculty and students. Especially as the requirements to fulfill accreditation and STEM criteria bring even more institutional pressure to a discipline that has been creative rather than scientific for most of its history.

Within this framework of interconnected parts, this paper proposes a content-based approach to discussing how architecture and architectural education need to be transformed as an academic discipline over the next decade. The question of how an architectural intervention on any scale relates to its environment may be as crucial as traditional object-based questions on building form, type, performance, or materiality. Similarly, architectural curricula should be further developed, focusing on the relationship and integration between courses and modules rather than course objectives only.

1.2 Chasing the Black Swan

The complex problem of climate change needs to be understood as a global crisis. Almost every discipline needs to contribute to finding solutions. Certainly, architecture and the built

environment must be part of the climate solution, as architecture forms and informs the physical background of everyday life.

While many architecture curricula have historically increased the complexity of student projects linearly from first year to graduation, this approach may not apply to major global challenges. The climate crisis needs to be approached holistically: from global to local, from large scale to small scale, from generic to specific, and vice versa.

Nassim Taleb describes a Black Swan as a “highly improbable event with three principal characteristics: it is unpredictable; it carries a massive impact; and, after the fact, we concoct an explanation that makes it appear less random and more predictable than it was” (2010, 4–11). Chasing Black Swans as a metaphor may be an appropriate theory for architecture programs when addressing the sometimes unpredictable environmental events that form the basis of built interventions of tomorrow on various scales. The role of design education in the realm of environmental impacts may be one to identify potential future impacts and cascading events, regardless of their probability. As architecture as an artistic discipline is allowed to keep developing micronarratives and progressive future scenarios, this artistic freedom allows experimental design to identify Black Swans. While artistic freedom often lacks traditional scientific research, architecture can be flexible and quick in responding to change. STEM affiliation, accreditation, expectations of the American Institute of Architects, and departmental requirements may make it more difficult to chase the Black Swans, yet approaching design challenges and pedagogy more methodologically and more scientifically may also lead to a new seriousness in design. Especially when considering global challenges like the climate crisis, interdisciplinary collaboration and a data-driven approach are necessary for architecture to succeed as a relevant academic discipline. In an age also driven by digitalization, the integration of quantitative methods for data collection that informs design is crucial as architecture defines its role aligned with STEM fields and collaborations in social and urban sciences.

The following paragraphs outline three curricular areas aiming to provide education on ecological design: (1) Design Studios, (2) Seminar Courses, and (3) International Initiatives.

2. CURRICULAR IMPLEMENTATION

The courses summarized under the title “Ecological Design Module” have been implemented at the University of Texas at Arlington College of Architecture, Planning, and Public Affairs in collaboration with the University of Innsbruck, Austria, Faculty of Architecture (Fakultät für Architektur), aiming to start a global campus concept.

The Ecological Design Module introduces concepts in architectural design and theory, tying natural, cultural, and built environments together. Ecology is approached as a complex system focusing on the interrelations between architectural components. The aim is to provide students with a comprehensive course sequence focusing on climate adaptation strategies on the (1) territorial, (2) urban, and (3) architectural scale. These courses may be taken in any sequence yet are constrained by year levels in the curriculum.

2.1 Foundation Studios as Design Incubators

Developing a strategy for a consistent architecture and design curriculum at the foundation level is a research task: it is based on disciplinary content, methods, and pedagogy. Foundation studios should be approached as design incubators to establish a timely response to (global) challenges within and beyond the discipline of architecture. A design

incubator is a space to critically address cultural and ecological issues through design and especially design principles. By nature, a studio or incubator is a collective experience built on the synergies of bringing a group of individual talents together in a creative work environment.

A contemporary design studio must tackle ecological topics in academia and practice as architecture materializes itself within the rapidly changing natural environment. Especially in basic design education, architectural principles should be investigated over time. Therefore, the education of an architect must not be seen as theoretical or unrelated to reality but as a product of cultural activity shaped by global trends and regional phenomena. Architecture always takes place within the real as long as progressive projects address contemporary problems through visionary concepts and designs. Design studios, even on the foundation level, should serve as a platform for both students and faculty to further develop their skills, tools, and research foci through the lens of basic design principles.

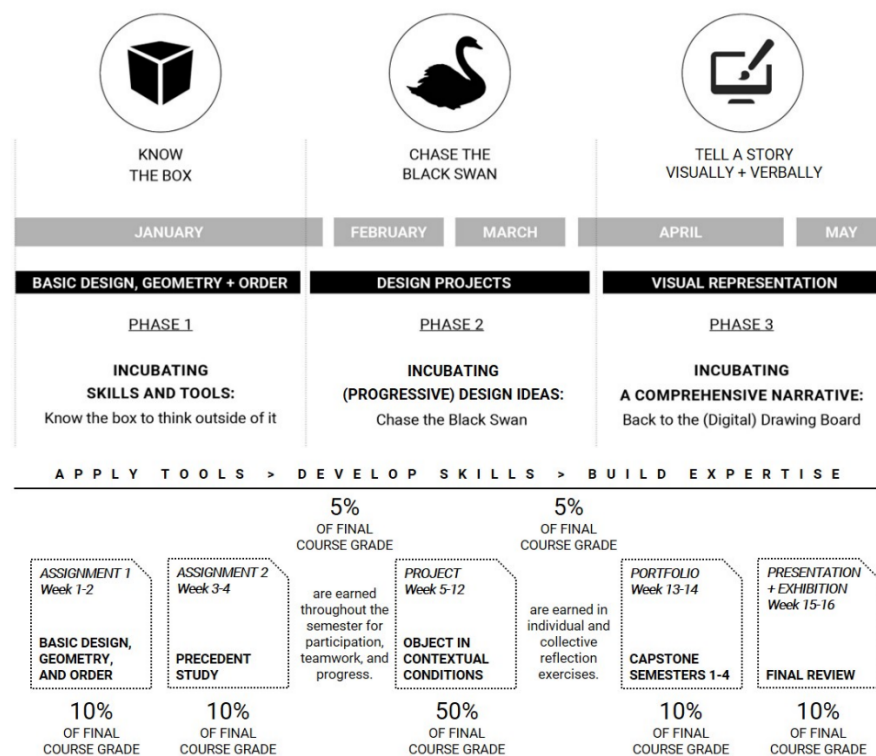


Figure 1: Syllabus overview of Architectural Foundation Studio (Oswald Jenewein)

The semester is divided into three comprehensive phases: (1) incubating (digital) skills and tools: exploring basic design, geometry, and order, (2) incubating progressive (design) ideas: chasing the Black Swan, (3) incubating a (comprehensive) narrative: telling a visual story (Figure 1).

First, students explore the geometric properties of an architectural object within Cartesian space to ultimately relate several objects to one another and to a datum. This abstract relationship between a geometric volume and the notion of surface prepares the main semester project when volumes become habitable spaces and the surface condition becomes a landscape. A precedent study introduces houses in different environmental conditions in this first phase, from coastal to urban to alpine contexts. The main objective is to understand the architectural object, or building, in response to

its immediate surroundings. This phase also defines architectural drawing principles, from applying line types, weight, and color, to generating floorplans, sections, elevations, and 3D models to scale.



Figure 2: A story of mutants, parasites, and hybrids
(Dianna Hozda, Karina Mendez, Alfredo Gallegos, Oswald Jenewein)

Most of the semester is spent chasing Black Swans, as described earlier. The aim is to introduce contemporary challenges while reducing the complexity of a challenge to a foundation studio project. Students work in teams of three to develop a comprehensive story of a fictional character who fights against a major global challenge, like an environmentalist, a scientist, or a journalist. The projects are placed in three distinct contextual conditions: (1) coastal wetlands, (2) urban plains, and (3) alpine forests. In addition, three distinct design methods are introduced, so each student starts the project applying a different approach: (1) addition, (2) growth, and (3) subtraction. The projects also start with an uncommon typological assignment. Students do not follow a conventional program but rather explore spatial relationships within the object and between the object and the ground. The typologies include (1) a mutant, a spatial structure based on five cubic volumes that are transformed into one object; (2) a parasite, a spatial structure attached to, but clearly different from, its host; and (3) a hybrid, a spatial structure in which ground and the object merge into one figure. Figure 2 shows a final semester project highlighting three projects in three different conditions as part of a continuously changing landscape. The one-point-perspective section as a representational tool makes interior spaces visible while the environmental conditions move to the background.

The third and last phase focuses on visual and verbal (re)presentation of the project. The teams now visualize the comprehensive narrative developed throughout the

semester and develop (1) poster boards and (2) a digital presentation alongside (3) a physical model. They also put their work up on display in (4) a student work exhibition and individually summarize their work in (5) a student portfolio.

2.2 Seminar Courses on Ecological Design

Nondesign courses in architectural theory are an integral part of both undergraduate and graduate curricula. The Ecological Design Module described in this paper includes three elective seminar courses that approach architecture through the lens of ecology: (1) Territorial Strategies (Territoriale Strategien), (2) Productive City Landscapes (Produktive Stadtlandschaften), and (3) Adaptive Typologies (Adaptive Typologien). These courses investigate ecological design on the scale of (1) a territory, (2) a city, and (3) an architectural object or building.

The premise for these seminar courses is the basic understanding of architecture as an integral process within the natural environment, not as a static object. Therefore, architecture is approached as a system of interrelated parts connected to and informed by contextual conditions. The conceptual framework of all courses includes a broad understanding of (building) life cycles, from resource extraction to construction, maintenance, and disassembly, related to environmental design, sustainability, and resilience.

In Territorial Strategies, students apply geospatial analysis tools to grasp the notion of landscape on the territorial scale. Charles Waldheim's *Landscape as Urbanism* book serves as a key reading assignment for this course. Students investigate specific territories to identify assets and challenges and synthesize them into strategies for proposing solutions on the micro and macro scale. This course focuses on global connections and is taught in collaboration with the University of Innsbruck in Austria.

In Productive City Landscapes, students utilize a participatory mixed-methods approach to identify selected ecological challenges of the urban scale. Randolph Hester's book *Design for Ecological Democracy* is a crucial reading component for the course. Students work with communities, private and public stakeholders, and other organizations in the field. A major method introduced is Participatory Action Research, which describes "(1) a commitment to investigate an issue or problem, (2) a desire to engage in self- and collective reflection . . ., (3) a joint decision to engage in individual and/or collective action that leads to a useful solution . . ., (4) the building of alliances between researchers and participants in the planning, implementation, and dissemination of the research process" (McIntyre 2007, 15–22).

In Adaptive Typologies, students draw, model, and generate diagrams and concepts to develop generic prototypes that apply ecological design strategies on the architectural object scale. A variety of readings, including Branko Kolarevic's *Architecture in the Digital Age* and several texts by Rafael Moneo, Jean-Nicolas-Louis Durand, and Quatremère de Quincy provide the theoretical background for this course. Through a series of typological investigations, students adapt existing (building) types to the environmental challenges in the age of anthropogenic climate change.

These three courses branch out into several interdisciplinary collaborations to provide a solid scientific foundation informing students about critical knowledge helpful for future design decisions. These collaborations include geo- and atmospherical sciences, civil and environmental engineering, and social sciences. In response to redefining architecture programs as STEM fields, cross-disciplinary work is a crucial

asset to both faculty and students in transitioning from artistic practice to scholarly discipline.

2.3 Global Campus: International Academic Initiatives

Travel components have historically been an important part of architectural education, yet the interaction between students and the sites visited abroad were often tourist-like experiences. Beyond visiting and experiencing built environments abroad, travel components should connect people, institutions, practitioners, and places in a collaborative way. Student involvement within (academic) communities and local institutions abroad enhances the opportunities to perceive a place by participating in creative activities and events. Students can immerse themselves in a different place for a short time and become a temporary part of it rather than being observers only.

To take international initiatives to the next level, faculty, students, and scholars need to be active members in academic exchange to generate a global campus. International academic partnerships are an opportunity for enhanced collaboration on all three levels. This paper builds its global campus initiative on the academic partnership between the University of Texas at Arlington and the University of Innsbruck. Started as a faculty exchange in 1989, the program opened to exchange students in 1996 and ultimately to scholars in 2018. Both institutions have been sending and hosting exchange students, faculty members, and visiting scholars.

Following a global campus concept, the course Territorial Strategies was first offered in 2019–20 in both architecture programs. To best showcase the potential synergies of working with partners abroad, a four-week summer program conducted in 2018 is described below.

A group of students from UT Arlington spent four weeks traveling through Europe during a summer study abroad program. Besides traveling to several cities from Amsterdam to Venice and Vienna to Brussels, most of the program was spent at a partner institution in Innsbruck. Students were challenged to design and build a seating landscape for a local youth center in Innsbruck in one week. Methodologically, the group followed a Design Thinking Process, aiming to (1) emphasize, (2) define, (3) ideate, (4) prototype, (5) test, and (6) implement a concept from design ideas to built outcome.

Bouncing ideas around within and beyond the group helped students to collaboratively design several iterations of possible outcomes before additional feedback led to the design of the final prototype. A similar sequence of idea finding was necessary to determine ways of setting up a movable workshop to work on-site. Choosing smart materials and construction methods was essential to stay on time and budget. The successfully built project was tested at an inauguration event with locals and visitors, users and designers who became a part of the group. The seating landscape has been successfully evaluated in everyday use.



Figure 3: Engaging with places and communities abroad: Innsbruck, Austria
(Oswald Jenewein)

3. CONCLUSION

For architecture programs transitioning to a STEM discipline, the traditional role of a teaching institution preparing students to practice needs to evolve into a more research-based academic institution contributing to a global architectural discourse. Suppose STEM-affiliated fields are becoming guides for how architecture schools will look in the future. In that case, architecture faculty members will ultimately teach less, research more, and approach their topics through measurable scientific methods rather than artistically. The transition in architectural education should be informed by content: as the climate crisis and emerging technologies blur the lines between organic and synthetic objects, as science and nature set the premise for informed design decisions, architecture as a STEM field may rise to a new level. With a lack of doctoral students and traditional research labs, architecture programs must push their research down to other year levels, at least to a certain extent. This is an opportunity to rethink architectural curricula and to develop a contemporary hybrid curriculum linking teaching and research.

In summary, this paper argues that (1) ecological design should be part of architectural education from first year to graduation; (2) architecture needs to develop a research-based identity if approved as a STEM field; (3) international initiatives should be seen as project-based partnerships to engage with local communities and collaborate with different organizations.

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ARCHITECTURE EDUCATION FOR WORLD CITIZENSHIP

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ABSTRACT

This paper presents findings from fourteen qualitative interviews conducted with students of architecture from eleven schools of the Nordic Baltic Academy of Architecture (NBAA) and from numerous conversations conducted with students in architecture at my home institution, Iceland University of the Arts (IUA). The findings of these conversations reveal that students consider a meaningful architectural education one that helps them make ethical design choices. To do so, respondents indicated that schools should help students find their inner compass, develop their professional skills and ethical attitudes, think independently, and make a difference in society and beyond. Four narratives emerge that describe the multiple roles of an architect in our society: the dissident intellectual, the ethical professional, the storyteller, and the caregiver of the world. Based on these findings, and with the support of the work of Henry Giroux's "Critical Theory and Rationality in Citizenship Education" and Martha Nussbaum's "Patriotism and Cosmopolitanism," a framework referred to as Cosmopolitan Citizenship Architecture Education (CCAEE) was developed.

Keywords: Architectural Education, Citizenship, Cosmopolitan

1. INTRODUCTION

This paper is an edited and updated version of the original one: "Becoming Cosmopolitan Citizens Architects: A Reflection on Architectural Education Across the Nordic Baltic Academy of Architecture (NBAA): A Student's Perspective," published in *The Hidden School Papers: EAAE Annual Conference 2019 Proceedings, Zagreb*. The research project is the result of conversations conducted with fourteen architecture students across the Nordic Baltic Academy of Architecture (NBAA) and with students in architecture at my home institution, the Iceland University of the Arts (IUA), where I am an associate professor and program director in architecture. The NBAA network is composed of sixteen schools of architecture.

My intention with this paper is to report students' voices conversing and reflecting together about something that is essential to teachers and students: the education of an architect, and possibly to find valid answers to the question: What does a good architectural education look like? Based on these findings, Henry Giroux's "Critical Theory and Rationality in Citizenship Education" and Martha Nussbaum's "Patriotism and Cosmopolitanism" are then used to formulate a framework referred to as Cosmopolitan Citizenship Architecture Education (CCAEE).

2. THEORETICAL CONTEXT

In 2016, an inspiring book edited by Elizabeth Resnick, titled *Developing Citizen Designers*, gave me the opportunity to reflect deeply on the value of citizenship in the education of an architect. Resnick opens the book referring to the words of the designer Milton Glaser: “Good design is good citizenship” (Resnick 2016, 12) and by stating that designers have the moral responsibility to use their skills to address the ongoing social and ecological crisis. *Developing Citizen Designers* not only encourages educators and students to embrace the notion of citizenship in design education but also provides numerous case studies that illustrate a design pedagogy capable of developing social awareness and prompt action. This reinforced my belief that architecture has a strong societal role that goes beyond forms experimentation, and consequently it is the duty of architectural educators to empower students to be world citizens who can act in the interest of the entire ecosystem to which they belong. My interest in citizenship led me to the work of the philosopher Martha Nussbaum (2010) and the educator Henry Giroux (1980).

Martha Nussbaum defines a cosmopolitan citizen as “the person whose allegiance is to the worldwide community of human beings” (2010, 154). A citizen of the world is a person with a unique identity, strong local bonds, and acute awareness of the state of the world: of its problems, injustices, and possibilities. Nussbaum’s cosmopolitan education promotes the understanding that we are all unique, precious, interdependent, and relational beings. As such, we need to learn to dialogue and collaborate to face the current crisis.

Henry Giroux defines citizenship education as transdisciplinary, relational, holistic, profoundly political, collaborative, and instigative of hope for a better world. The primary focus of citizenship education is to enhance civic courage by stimulating “students’ passions, imaginations, and intellects so that they will be moved to challenge the social, political, and economic forces that weigh so heavily upon their lives” (Giroux 1980, 357). Citizenship education is based on critical thinking, social awareness, and action competence. Critical thinking requires challenging the status quo and reexamining old practices and established beliefs. Social awareness is about developing empathic and social skills to understand the conditions of others. Social action means having the courage to pursue ideas beyond the classroom into the world and being inextricably related to everything within the web of life.

Cosmopolitan citizenship education requires an openness to guaranteeing that all learners have equal access to education (Wink 2000, 71). Cosmopolitanism and citizenship expand the language of architecture by encouraging educators and students to be much more than spatial explorers but to be world citizen architects who are interested in designing how all earthlings can live harmoniously together. Becoming cosmopolitan citizen architects means learning to make ethical design decisions that are grounded in their social and environmental context and are equally influenced by the understanding of their local and global implications—ultimately, we are all connected as citizens of the world. Architects have a social and ecological responsibility to design spaces for communities in harmony with nature and to pursue the spirit of social and environmental justice. With this serving as the theoretical context, the next step was to dialogue directly with the students.

3. METHODS

Dialogues are the essence of education: “without dialogue there is no communication, and without communication there can be no true education” (Freire 1993, 66). During the fall of 2018, I visited eleven schools of architecture that are part of the NBAA network and conversed with fourteen students, five men and nine women, between twenty-two and thirty-two years old, in their fourth and the fifth years of study. All interviews were semistructured, initiated by the following three research questions:

- Q1 What skills should students have after studying architecture?
- Q2 How should these skills be taught?
- Q3 How can the education of an architect be of special importance to our society?

The questions were designed to be sufficiently “open-ended yet directed, shaped yet emergent, and paced yet unrestricted” (Charmaz 2014, 85). Question number three is a “sensitizing concept” to encourage the interlocutors to reflect on the societal role and responsibility of an architect (Charmaz 2014, 30). All interviews were recorded and transcribed for a total of 8 hours and 43 minutes. All participants received the transcripts and were invited to make comments or amendments if necessary.

On my return to the IUA in January 2019 I continued asking the same questions to my current and future students in formats of group interviews, singular interviews, and workshops. So, the same three questions were asked to a total of thirty-two current students at the IUA and sixty-four prospective students, specifically:

- 34 prospective students in architecture (interviewed May 6 and 7, 2019);
- 30 prospective students in architecture (interviewed May 27 and 28, 2020);
- 21 second-year students in architecture at the IUA;
- 11 international students studying at the IUA during the academic year 2019–20.

All the interviews were analyzed using the abbreviated Constructivist Grounded Theory (CGT) method, which helped me examine the data (transcribed interviews) before framing a specific hypothesis (Charmaz 2014). By listening closely to the students’ voices and their narratives, strong connections emerged between them and the understanding of Cosmopolitan Citizenship Architectural Education. The intention of this paper is therefore to show the genesis of this concept by using both literature reviews and students’ dialogues.

4. FINDINGS: FOUR NARRATIVES

All students interviewed began their answers by recognizing the overwhelming scope of architectural education and questioning whether it is doing enough to prepare them to respond to the ecological and social crisis felt to be of paramount importance for the continuation of life on our planet. These fundamental concerns shape students’ vision of architectural education to be intended as a social platform for personal growth and critical thinking, for social awareness, and collaboration with other people for a better world. Four fundamental narratives consequently emerge. They describe the architect as a “dissident intellectual,” an “ethical professional,” a “storyteller,” and a “caregiver of the world.” These four narratives were consistently present in all the answers to the three questions and

constitute the foundation to build the conception of Cosmopolitan Citizenship Architecture Education CCAE.

4.1 First Narrative: The Architect as a Dissident Intellectual

This narrative is based on understanding the role of architects as people who are critical of the current reality and who use their knowledge and voice for ecological and social amelioration. This resonates tremendously with how the educator bell hooks defines dissident intellectuals as people who “are critical of the status quo and . . . dare to make their voices heard on behalf of justice” (2003, 187). Respondents understand that even though architecture has a vivid image, it is not just a picture to be published in a magazine: “Architecture education should not just be about designing beautiful houses; it should make us critical” (student in architecture at Chalmers, Gothenburg, November 14, 2018). This element of criticality or awareness is considered foundational for their education. Students know architectural education is a lengthy and complex process; nevertheless, they show a surprising optimism in firmly believing in the importance of architecture.

Respondents believe that “you can use that kind of process (architectural thinking) in many ways” (students in architecture at AAalto, Helsinki, December 11, 2018), since architecture is about making sense of the world, dealing with its complexity, and finding solutions. But to be effective, architectural education needs to act as a social platform capable of exposing students to different sources of knowledge, learning conditions, experiences, and diverse points of views. Specifically, one student states:

Teachers must be different so that they can support the students to find their own voice, their own path, and in that way, they may be [able to] find their voice and then can contribute to the society in some ways or have an opinion and so on. (Aalto, Helsinki, December 11, 2018)

Exposing students to a diversity of thoughts is key for helping students find their inner compass, their mastery, and for developing the empathy and confidence that is needed to then position themselves as outspoken, critical, socially aware architects—that is, to acquire the role of dissident intellectual, of a person who uses architectural thinking for the greater good. One student states: “We are not the same persons, and the school should not produce the same architecture students” (NTNU, Trondheim, December 20, 2018). When students feel confident about their skills and optimistic about their future, they also feel liberated and empowered to imagine their many possible roles in society. And they embrace the diverse possibilities with enthusiasm, as one student states: “This is not the time to be in one cage to decide whether you are a professor or a practitioner; this is the time to be all over the place!!” (RTU, Riga, November 29, 2018). There is therefore no singular dominant vision of what an architect should do. Architecture is plural and diverse, and architects will bring their working method and critical collaborative capacities into every task they are working on.

4.2 Second Narrative: The Architect as an Ethical Professional

“I look forward to participating in the creation of a more sustainable future.” (Prospective student in architecture, IUA, Reykjavik, May 27, 2020)

Students are aware of the basic competencies that are necessary to operate as architects; these range from having a good spatial understanding to the ability to visualize and test their ideas by using the appropriate software. One student says: “What I think of first of all is critical thinking, problem solving, spatial thinking, and basic skills to express your ideas like drawings. One very important thing is to have an opinion and not be afraid of expressing it” (VDA, Vilnius, November 22, 2018). Nevertheless, these competences alone are not enough to educate good architects. Another student says:

I think that architects should not only have knowledge about using computer skills but also have the understanding of how to make architecture more social and think about other problems, which are, I think, something of what we have to consider when we work tomorrow.

(VGTU, Vilnius, November 27, 2018)

Architects design buildings and processes, and the act of design is about making choices, the impacts of which reverberate in society and beyond. Architects should therefore be aware of their role and responsibility in society and sensitive to the fact that for every design choice there is a corresponding social and ecological impact that needs to be understood and evaluated, not just in terms of costs and space but also in terms of its social and ecological value. Designing the right thing is therefore more important than designing the thing right. The latter is focused on the accuracy of the product, while the former is based on critical thinking and reflects its context in the bigger picture. What are the potential social and environmental effects on this act of designing? What power relations are shifted? What other options are there? What could be the long-term consequences? Who makes the decision? Who builds your architecture? In other words: “What is the story behind a beautiful building?” (Chalmers, Gothenburg, November 14, 2018).

Students do not want to be part of a system of ecological and social exploitation; they want to operate as a positive, restorative force in their society and, most importantly, they need to believe that what they are doing is the right thing. One student puts it in these terms: “I just want to do something that interests me and have a positive impact for our environment and society” (Aalto, Helsinki, December 11, 2018). Students show empathy, sensibility, and courage to operate ethically for the greater good of the society.

4.3 Third Narrative: The Architect as a Storyteller

“It does not have to end with an architecture project.” (AHO, Oslo, November 16, 2018)

This narrative is based on the importance of storytelling. Architects are people who ultimately do not build but rather coordinate the social and design processes that lead to building. Communication is fundamental in this collaborative process, and architects need to learn how to engage and converse with the world. One student says: “I think the responsibility of the school is to give the students a way of interacting with life with their field of work” (RTU, Riga, November 29, 2018).

Consilience, or the ability to link together principles and people from different disciplines, is valued as an important quality that an architect should have. As one student explains it: “I think that the most important skill is cooperation and collaboration” (BAS, Bergen, November 19, 2018). This quality is fundamental for solving the ongoing social and ecological crisis. Consilience requires social and collaborative skills to operate as an activist

and protector of the common good. It is not just about problem solving but also about revealing important and cogent issues of our times and creating sufficient consent and support to be able to tackle them collectively. One student illustrates it this way: “to be critical and to be able to work with others, and what I mean with this is the capacity to put your feet in somebody else’s shoes, so this is also in terms of empathy” (Chalmers, Gothenburg, November 14, 2018).

Storytelling in this sense then refers to the ability of the architect to understand cogent issues and to reveal them using architectural thinking and tools (models, diagrams, narration, photography, installations, publications, writings) as vehicles for communication. To help students develop these skills, schools have to become platforms for socialization, allowing different knowledge and experiences to work together, as one student says: “I think everything should be connected” (KADK, Copenhagen, December 22, 2018).

4.4 Fourth Narrative: The Architect as a Caregiver of the World

“I would like to participate in creating and changing the world.”
(Prospective student in architecture, IUA, Reykjavik, May 6, 2019)

An important aspect that needs to be underlined is that despite the fact that the interviews started with the specific question, “What skills should students have after studying architecture?,” students’ responses began by illustrating the context of their education in a time of global ecological and social crisis. Respondents position themselves primarily as people who care for the earth, for the common good: “Architecture has an impact on everybody’s lives” (KADK, Copenhagen, December 22, 2018). “You should really take the environment into consideration in your design” (AALTO, Helsinki, December 11, 2018). The idea of “care” is a lens through which students not only look at the world but also act to ameliorate the world as both professionals and citizens. Respondents show awareness in understanding that architecture can both act as a source for good and amelioration, but equally can further contribute to exploitation and ecological destruction. Respondents show skepticism toward big corporate firms, defined as entities that do not care enough, and seem much more inclined to work in their local context with people that they can trust and on projects that they feel passionate about. Working locally does not exclude them from being in contact with the world and using their established networks to collaborate on projects that cross geographical boundaries.

5. CONCLUSIONS AND FUTURE WORK

Respondents depicted the multiple roles of architects. For all students in architecture, their education is intended as a journey that helps them find their path and develop as autonomous individuals, and equally to become professionals capable of working collaboratively. To do so, architects need to learn to converse with the world. This is considered the best way to incite their sensitivity and prompt ethical design solutions. It would be important to understand whether these traits are specific to students in architecture or whether they are universally shared among students from different disciplines. To answer this question, more research is needed.

The findings of this research reveal four fundamental roles of an architect in our society: the dissident intellectual, the ethical professional, the storyteller, the caregiver of the world.

A good architectural education should therefore help students pursue their unique path in architecture while caring for the world.

Acting as a model from the world of education, one person has emerged as a leader and catalyst of change: Greta Thunberg. Greta simply says that education without a future has no meaning. She has become a leader who brings students and education to the front line in the quest for a solution to the climate crisis. September 20, 2019, will be remembered as the Global Climate Strike, which is said to have been the biggest climate protest in world history (Barclay and Resnick 2019). Students therefore feel that they are not just called to a cause, but they promote the cause itself. This is the context of this research, of its methods, of its dialogues and findings. The paper's intention was to provide an interpretative and explanatory framework with which to understand the students' voices, including their understanding of what it means to be a student in architecture in the current context. Students from the NBAA capture the essence of their education as a journey to develop critical thinking, to acquire social awareness, to instill social activism, and to grow.

CCAIE can help us answer the question of what does a good architectural education look like? Educators can teach the right thing when students are allowed to bring their experiential knowledge into the classroom, when educators create the conditions that make students critical and engaged, and when educators help students nurture their individual talents without forgetting that we are all connected and interdependent.

CCAIE is intended as a way to develop a more caring and intimate relationship between architects and their community, one that is based on social awareness and collaboration, driven by the desire to operate with care and social responsibility (Santanicchia 2019). Becoming cosmopolitan citizen architects means learning to understand the social and environmental impacts of design decisions and how those decisions can respond to the cogent issues of our society. This means becoming critical thinkers and outspoken intellectuals, carers of our planet and its earthlings, and stewards for promoting the necessary collaborative change that we need to protect life on this planet. Architectural education's scope therefore goes beyond building design; it is about how people can live and flourish together in an environment that is always both natural and human-made.

This requires education to be place-based and socially contextualized. It requires education to cross disciplinary boundaries. It requires education to be generous and to welcome people from all walks of life. It requires education to be about the common good and how we live together. And it requires students and teachers to work together, to use critical thinking to discover awareness and activism. It requires the confidence, competence, and art of consilience to be a public intellectual, an ethical professional, a storyteller, and a caregiver of the world. It requires care and courage.

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DESIGN RESEARCH METHODS—APPLIED THEORY AND STUDIO

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ABSTRACT

Today, the curriculum at schools of architecture is generally subdivided into design studio (practice) and the adjacent scientific or scholarly subjects ranging from natural sciences to technology to humanities, often with their own separate faculty, degrees, and institutional structures. This separation is widely experienced as a fragmentation of a discipline that claims to be integrative and wholistic. This essay provides a sketch for an alternative pedagogical format of integrated design research methods and studio at the graduate level, which could help bridge these perceived institutional gaps, but also offer a research agenda of its own kind. Design Research Methods is framed here as an applied theory, since exemplary design approaches themselves are selected, analyzed, comparatively discussed, and serve as a primer in the studio environment, while in turn the studio tests various theoretical concepts, design approaches, tools, and methods, and provides feedback to theory. This applied theory is not meant to replace traditional forms of critical inquiry, reading, and writing but should serve as a complementary addition that empowers students to define their own research and design agenda for their thesis year and beyond.

Keywords: Architecture Theory, Design Studio, Methodology, Pedagogy

1. NOTES ON THE GROWING DISTANCE BETWEEN THEORY AND PRACTICE

Architecture is not a science, but a cultural practice. Yet there are certain scientific approaches to architectural questions and issues that ask for a methodological understanding within the discipline. Traditionally, these have been grouped into two general categories: humanities with research in history, theory, sociology, anthropology, and other such fields on the one side, and natural sciences with physics, mathematics, civil engineering, material sciences, fabrication, and computation on the other side. Design (studio) is conventionally considered to be the arena where the diverse subfields converge, overlap, interchange, and integrate in a creative process—both in education as well as in the professional field.

This essay sketches out a different approach to contemporary architectural pedagogy: design research methods. This course offers a hybrid format that crosses between a scientific method and design, since it aims to catalogue, analyze, and theorize different design approaches in a comparative manner. That is, it tries to gather some generalizable knowledge of the discipline by systematic research into the design process itself. And it is applied theory, since it introduces these design methods back into the studio, puts them to test (for a specific design problem), and asks students as well as instructors to comparatively discuss their “performance” for a specific situation.

Since the establishment of specialized institutes within schools of architecture in the late 1960s and '70s (history, theory, and cultural studies as well as technology, engineering, computation), there have been continuing concerns about the separation of the subfields of architecture from design (studio), creating academic silos, which result from the institutionalization, specialization, and autonomization of these academic formats (such as specific master's and PhD programs). This analysis is not based on empirical studies, but on the observations of the author from ETH Zurich, Harvard GSD, MIT, RISD, TU Berlin, TU Wien, TU Graz, and University of Utah, as well as derived from conversations with colleagues from different institutions in North America and the German-speaking world. Yet what seems significant here is that the more research intensive and the more autonomously these institutes operate—such as the Institute for the History and Theory of Architecture (gta) at the ETH Zurich or the History, Theory and Criticism of Art and Architecture program (HTC) at MIT—the more they are perceived as being distant from design studios and architectural practice.

Today, the difference between knowledge (or “understanding,” in the language of NAAB) and application (or NAAB’s “ability”) is one of the biggest obstacles for design education. Both students as well as society at large ask for a rapprochement between the diverse subfields (“integrated architectural solutions” according to NAAB). This rapprochement between the various subfields and studio wished for by architecture students, designers, and accrediting bodies—and this is a hypothesis—could provide an opportunity for convergence and integration of diverse sets of knowledge into action. Since the author can only comfortably speak for the humanities side, this essay discusses an immersive integration of History Theory Criticism into design studio, and—this is important—vice versa in a format that we call “design research methods.” This essay addresses a predominantly pedagogical format in which diverse subjects are integrated into studio, which are in themselves not yet “scientific” or “scholarly,” but rather provocations, polemics, and historical avant-garde practices that form part of contemporary architectural discourses. Yet it also offers a research perspective wherein theoretic input, design practices, and critical reflection go back to new theories about pedagogy and design.

2. METHODO-PHILY?

In what follows, I sketch out an applied design research methodology (or methodophilia?) that first would have to document, process, and systematize various approaches of architectural design and neighboring artistic disciplines. Second, it needs a critical assessment of the all too many subjective poetics, which means, a comparative testing of their performance and uncovering of blind spots related to nonarticulated belief systems. In studio, architecture students learn how to form a design argument, develop alternatives and variations, test and select one of them, then provide reasons for their selection and work out one design approach into a project, which reduces complexity and options.

Yet a methodological approach toward design moves in a complementary and oppositional direction, that is, a step-by-step opening up of the design decisions, making them visible. This includes verbal/written statements as well as representational/graphical media, the explication of options and alternatives, as well as the questioning and critique of once-made decisions. One could speak of deconstruction and reconstruction if these terms were not so overused in architecture. Third, through the exploration of the design methods

of others, critical design methods lead back to an application in studio, partly as test and “falsification,” to say it in the words of Stanford Anderson borrowing from Karl Popper (Anderson 1965, 86–87), or rather, to a critical use of design methods by the students, who are enabled to change from theory (methods) to application (design) and back to new theory (reflection over practice). The overarching goal of a critical design research methodology is not to stop at the systematization, ordering, comparison, application, and reflection of existing design approaches, but to clarify the sociocultural, economic, and political frameworks for various design approaches, and to envision design approaches for alternative forms of social organizations. Otherwise, architectural research might be in danger of losing its subject: the practice of architecture and its role within society.

3. DESIGN METHODS

Design is difficult to communicate, since much of it happens in silence as “tacit knowledge” (Cross 2006, 9). Hence, design is taught in schools of architecture through “studio,” that is, a pedagogical lab environment of learning by doing, where articulation comes in retrospectively—at the weekly desk critiques with the instructor or at the midterm/final reviews in front of a jury. A reflection on the methods of design is normally not part of this process of learning by doing, neither from the students’ perspective nor from the instructors’. Rather, just by the choice of the design studio and the professor/instructor the students automatically select a specific methodological and formal design approach: students take the studio of instructor X to immerse themselves in the architectural design of instructor X. And since this design approach is only discussed retrospectively regarding students’ projects, a common concern among students is that there must be certain preferred ways of designing, which they feel are withheld from them.

Similarly, the field of “design research” defines the practice of architectural design as a cognitive faculty different from scientific-logical quantitative thinking as well as linguistic-scholarly qualitative thinking, or abductive thinking—different from deductive and inductive models. And unlike a purely functionalist understanding of “design” as “problem solving,” where maximal information leads to a distinct, best solution, design is reframed as a bundle of explorative, emergent, opportunistic, reflexive, nonidentical, and ambiguous solution strategies. These strategies can deal with complex phenomena on multiple interrelated levels and with variables with only partial information by projecting their own patterns of order onto them, which leads to a dialogical process between possible formal interventions and the original problem space (Cross 2006, 32–34; Rittel and Webber 1973). Design, in other words, not only entails the creative finding of formal solutions, but it changes, reframes, and unfolds various aspects of the problem complex in reaction to these projections. Despite the ambiguity of both the problem and the solution, exacerbated by the only partial verbal disposability, it would be mistaken to conclude that there are no methods for architectural design, or, similarly, that the existing ones were beyond expression and systematization. Design employs plans, drawings, diagrams, images, and model building, that is, primary nonverbal, yet highly conventionalized and codified forms of representation.

4. COMPARATIVE APPROACHES TO DESIGN

Hence, a first step toward a critical design research methodology lies in the comparative and nonjudgmental consideration of multiple design approaches, which should not be reduced immediately to “style” nor problem solving competency, but rather read as multiple

possibilities or conjectures. To open these “conjectures” for (pedagogical) discussions, one needs to engage with them one by one, beginning with primary texts—that is, texts written by author-architects themselves—as well as secondary texts—descriptions and interpretations of a specific method by theoreticians and critics—accompanied by a process of reading design examples. From this theoretical entry point into one specific design approach follows practical engagement with various media, such as drawing, collage, diagram, model, terms, information, gestures, and so on, in which students explore, appropriate, deviate from, and adapt its “usability.” In this pedagogical set-up, each design approach is seen not only in light of a potential architectural solution for a given problem but also as a conceptual frame for a better understanding of the design problem, in the sense of “generative thinking.” By exploring design approaches and research methods one by one, the students project formal structures, organizing principles, and conjectures onto the same problem, and through their comparative (self-)criticism, they learn more about site, context, ecology, program, constructive and material options, and about other aspects such as user groups, social forces, economy, politics, and history by shifting perspectives with every approach. The projecting of a design solution, the redefinition of the problem space, and the development of evaluation criteria work hand in hand (Cross 2006, 77–78). Drawing and other forms of representation—analogue and digital—serve both the outside communication with others, for presentations, as well as visualizations of the internal thinking process of the student, as a manifestation or trace, which now allow for an analysis, evaluation, and selection of one of the potential options, triggering further design options and alternatives. In these outputs, various parameters of the design problem, from the different research and design methods to various levels of abstraction are addressed concurrently and hence become accessible for reflexive thinking, speaking, and writing.

These reflections on a critical method of design are far from abstract themselves, since they were developed in preparation of a specific course at the University of Utah School of Architecture and came out of a two-year faculty-led process of redesigning the entire curriculum (Bachelor and Master) between 2016 and 2018. I was charged with developing and coordinating an integrated Design Research Methods course at the entry level of the restructured Master of Architecture program, integrating lecture, seminar, and studio. In the curriculum reimagination, faculty and students decided to move from a traditional final studio model in which the graduate students would select from three different studio options (connected to a specific problem, site, and studio professor) toward a more research-driven free thesis project. To prepare for and guide students through this new process, the faculty decided to offer two new mandatory courses on the graduate level: Research Methods I and II. While the first one is offered for incoming graduate students in order to survey and test design approaches and to develop a research and design agenda, the second one in the third graduate semester prior to the final serves as thesis prep, that is, as a seminar-size format to identify a design question, research background, program, and potential sites, and develop a narrative around the project to be defended before a jury of studio advisors and accompanied in the final semester by a thesis book.

Charged as a team of three instructors with developing the first of these research methods courses integrated with design for fall 2018, we decided early on to expose students to a variety of methodological and research entry points into the design problem in a comparative and reflexive way. To provide a comparative approach, the set-up included a preselected site and a given program, as well as the weekly structure of lecture on Monday morning, discussion of key texts, concepts, and examples of a specific approach in seminar

on Wednesday, individual desk critiques Monday and Wednesday afternoon, as well as a collective design review of all sections on Friday afternoon. Against this rigid structure, differences between the design approaches from week to week were meant to stand out more clearly, so that students could grow a comparative understanding by identifying different problems, gathering information, and developing potential solutions and criteria for evaluation and reflection. “Comparative” here refers first to the different weekly design approaches, themes, and arguments targeted toward the same issue. Second, “comparative” also relates to the students’ results, since all students worked on the same program, site, and weekly method, yet when pinned up together every Friday afternoon, they showed a wide variety of interpretations, research interests, and design outcomes. “Comparatively,” finally, was applicable in the sense that we as instructors hoped for an in-depth discussion about the adequate forms of representation for different research and design strategies, since each seems to favor different modes of communication. Hence, we formulated the assignments to be as open as possible to a wide variety of media, instead of providing a list of deliverables, and always intended in our reviews and discussions to address the “how” as much as the “what.”

The pedagogical aim of the team was to trigger a kind of “perspectival thinking” (Nietzsche 1968, 383) in which every change of viewpoint changes the perception of the problem, and hence the intention that students would begin to grasp that every method brings new information and challenges, and the design problem changes with the applied method. As pointed out by “design research” (Cross 2006), the creative process does not only deliver new formal solutions or organizational patterns but restructures the understanding of the problem itself. By challenging students to change week by week from one design method to the next, “projecting” each of them on the same site and program, the objective of the course has been not only to instigate a diverse set of approaches but also to open up additional dimensions or layers with each approach, bringing new information, tools, and criteria to the table. Each partial response to one method could influence and inform the next stages of the design, even if the students choose to continue to work with one specific and different design approach, and hence allow for a (self-)critical reflection of the steps taken. With this pedagogical set-up of weekly exercises over the first term, the course was to survey different design methods, bring forward a more complex understanding of the design question, and offer general entry points into a design project by practical exploration of the approaches. The comparative discursive aspect was supposed to center on the weekly Friday review, where all results were pinned up (or built up) in parallel. The pedagogical concept here was to turn from provocation (lecture on design research method and examples) to response (seminar discussion and desk critiques) to reflection (group pin-up and discussion). The idea to hold the weekly review in plenum with all students and instructors was to compare and search collectively for emergent patterns and to differentiate between horizontal transformations (variations on the same theme) and vertical transformations (convergence on a similar theme from different directions). Finally, the pedagogical concept of comparative weekly reviews was supposed to animate students to review and comment on their peers’ interpretations, approaches, and forms of representation, and to learn from this comparative criticism to develop new research methods and design approaches.

5. TEACHING INTEGRATED DESIGN RESEARCH METHODS

To address the applicability of a comparative design research methods course, and not stay with the theoretical aspects of it, I will briefly describe an example from the first run for the incoming Master's integrated studio in fall 2018 at the University of Utah School of Architecture. In conversation with the faculty who had taught final studio (last semester Master of Architecture in the old curriculum) in the previous years, and from the discussions about the new curriculum, its objectives, and learning outcomes, I was charged to coordinate a team of three instructors. In a first step, we prepared a list of design methods and research entry points into a project. In a second, we consolidated the list to seven design approaches, which would be discussed and tested during the first half of the fall semester. Also, we decided to preselect a site in Salt Lake City and a program—a center for air quality and sustainable tourism in the mountain West (connected to a potential second bid for the Winter Olympic Games)—in which students were encouraged to engage critically and change or expand programmatic elements as they saw fit. The seven design approaches were, in the weekly order of the semester: (1) contextual/place specific, (2) parametric/experimental, (3) ecological/sustainable, (4) translational (spatial practices from art/music/performance), (5) diagrammatic, (6) programmatic, and (7) atmospheric/experiential.

Each week of the first seven started with a lecture on Monday morning that introduced the design and research methods with two or three key theoretical texts representative of this specific approach. The input opened up the contexts of this position, addressed their agenda as well as their reception in the discipline, and illustrated this approach with reference projects, which included executed buildings as well as speculative design proposals, exhibitions, installations, or artistic formats from other disciplines. For consistency and transparency, the students had full access to the entire semester program, all the deliveries, deadlines, materials, and readings from the first day of the semester, with the intention (and explicit advice) to review the materials before the Monday lecture. One aspect of importance was the selection of diverging, conflictual theoretical positions within one week's method to avoid falling into the trap of imitating a precedent, which is known in "design research" as a "fixation problem." This means the tendency of a designer to stick to a known precedent and primarily search for variation and adaptation of the model, or to follow its principle features rather than explore the structure of the problem and potential spatial pattern itself, which artificially reduces or limits the potential outcomes of the design process (Jansson and Smith 1991). For the same reason, the examples shown with each method were from a broad and diverse background, by various offices and authors, so as not to propagate one specific design model, form of representation, or "style," but rather to entertain a controversial discussion about different sources, understandings, architectural positions, tools, and references.

Directly after the lecture, the group split up into sections with their studio instructor to reflect upon the material presented in group discussion and answer questions, before students started to work in studio on their weekly "approach." On Wednesday morning, the class came together again to discuss the texts, authors, concepts, and references once students had begun to work on their weekly research and design translation of the specific method, while the afternoon was dedicated to studio and desk critiques in the class sections. Friday afternoon the entire group of students and all instructors came together for a weekly review of the research and design concepts developed under one theme or method, including peer review and self-criticism of instructors and students (what worked,

what did not, where there were obstacles or blind spots, what seemed paradigmatic solutions, and so on). Since the students returned to the same site, context, and program week after week, but scrutinized these “givens” in relation to new readings through the various research and design methods, they learned to reapproach, reframe, and reexamine the problem and their previous conjectures, which often led to a change in design principles, in design primitives, in forms of representation, and along with those, the concepts and criteria of their own approach. Also, here our pedagogical intention was to encourage students to explore different and in themselves incompatible directions, patterns, or design solutions to prevent students from falling back into established design habits from past semesters, precedents, or stylistic preferences. One of the findings in the curricular reimagination that was of general concern to the studio faculty: master’s students tended to reiterate the same methods or similar design approaches and seemed reluctant to explore alternatives that went beyond variations on the same paradigm.

After the first seven weeks (and, fittingly, fall break), we introduced a “reflection week” during which the group of instructors conducted individual interviews with each student. They were charged with preparing a “portfolio” of their experiences of the first seven weeks, in which they were asked, as a form of design hypothesis, to edit the research findings, approaches, concepts, and potential solution(s) to one scheme or research agenda that they would like to expand and continue in the second half of the term. From this moment on, theory and studio changed rolls; now the “design research methods” seminar served to support the studio, rather than setting the themes, methods, and inputs. In studio, students focused on expanding and adapting (or combining or inventing) a research and design approach into a full project, while for the research methods course they started writing a (self-)analytical paper about their research, design approach, and process. In those second seven weeks, we scheduled one formal mid review and the final presentation, always with the whole group of instructors present to maintain consistency in our conversations (and to celebrate a certain level of critical disagreement). In coordination with the deadlines of the studio, students submitted an abstract, an extended abstract, and a draft of their paper, and after the final review, they submitted the final edited version describing their research, their design method, the application in their project, the process, as well as a positioning in the discourse of architecture with references to texts, precedents, and bibliography.

6. CODA: LESSONS LEARNED . . .

Time for self-criticism: what seemed to have worked well was the design charette style of weekly exercises, as well as the group discussions with students in the first seven weeks on the Friday reviews, which led to engaged and sometimes controversial debates. Some students were able to keep the momentum going in the second half of the semester, and to their own surprise, were diving deep into research questions, formal approaches, and architectural solutions that might have seemed foreign to them prior to this, including failure, (self-)analysis of that failure, and a search for alternatives. Other students, however, fell back into their habitual design approaches in the second half of the semester, once the “pressure” of weekly inputs and reviews was lifted, and this led more often than not to starting from a program diagram and extruding it into a “building.” The shortcomings of such a reductive “problem-solving” approach became more obvious in their reflective papers than in their studio projects (where the better ones of this group achieved a competent final project), since these students struggled to articulate how they had gathered information,

identified an approach, and developed a central theme or idea for their project, beyond fulfilling a basic programmatic consideration.

In the second iteration of the course in fall 2019, the team of instructors discussed these findings and decided to change the sequence of the seven methods. Additionally, we reduced the program to a “core,” with the challenge for students to advocate additional programmatic elements, and the instructors offered a series of sites to select from. By these two latter measures we hoped to foster an early pro-active understanding of program as a design problem in itself. Also, we challenged students to make a case for a specific site based on their chosen method and interpretation of the theme/program(s) as part of the midterm reflection week before they could transition into elaborating one design approach, which is also the starting point for their research-reflection paper. This should help students identify themes, sites, and programs once they move into Research Methods II (aka Thesis Preparation). But we also agreed on these changes because as a group of design educators, we believe that today students need to progress from problem solvers and service providers to acting in public, in the sense of the political theorist Hannah Arendt (1958), who distinguished the existential materialist labor of self-preservation and reproduction from the technical-artistic work of the producer and craftswoman, and from wished-for politico-social action in public space.

ACKNOWLEDGMENTS

Thank you to Dwight Yee, Matt Daines, and Steven Chodoriwsky, who codeveloped and cotaught this integrated course in 2018 and 2019 respectively.

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ENGAGING DESIGN-BUILD PEDAGOGY

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Design-build pedagogy has become increasingly central over the last decades as a pivotal moment in the education of architecture students. The session “Engaging Design-Build Pedagogy,” chaired by Christian Dagg and Hans Butzer, discussed the main opportunities and questions that design-build educators face today.

While nearly every school aspires to incorporate design-build into its curriculum, it is not without controversy or risk. One of the most critical questions is: do design-build projects serve students, schools, or communities? Whether projects should aim for glamorous experimental forms or humble cost-effective and resourceful design is another point of contention. Who benefits from these various approaches and at what cost? Is it possible to develop a theoretically rigorous design-build curriculum? How should design-build programs balance economic constraints inherent to affordable housing, for example, with design aspirations? As these many questions suggest, despite decades of experience, design-build pedagogy is still an emerging and contested area of architectural curricula.

In the talk “Beyond the Build,” given on the first day of the session, Christopher Trumble presented a comprehensive investigation of these questions.⁴ Trumble’s contribution is grounded in years of teaching design-build practices, culminating with the delivery of “The Sonoran Pentapus,” a steel grid-shell pavilion, built adjacent to the University of Arizona College of Architecture, Planning and Landscape Architecture (CAPLA) building. As Trumble argues, design-build pedagogy is an experiential opportunity focused on a multitude of learning objectives, including education, pragmatism, and practice laboratory. Above all, Trumble stresses the importance of collaboration strategies to foster a successful design-build experience, such as meticulous design coordination and group evaluation.

Ted Cavanagh’s talk, “Theory and Design-Build,” is centered on the relationship between theory, research, and design-build.⁵ More specifically, Cavanagh’s contribution is focused on investigating how design-build courses can be framed as a more rigorous theoretical paradigm to generate new knowledge in the fields of technological innovation and social change. Cavanagh’s approach builds on a series of innovative live studios and full-scale applications at Dalhousie University, Nova Scotia, Canada. These studios focused on experimental construction systems, such as lamella and timbrel vaultings. His contribution stresses the importance of extending the “learning by doing” pedagogy to promote innovation in construction and expose design-build educators to perspectives offered by social theory.

Architectural pedagogy has often identified design-build practices as ideal opportunities for aiding communities in need. This community-centered approach is grounded in the pioneering work of Rural Studio at Auburn University, Newbern, Alabama. Since the beginning of the 1990s, Rural Studio has worked to improve the quality of life of depressed rural areas in West Alabama by implementing a series of small-format community pavilions and housing projects designed and built by a team of faculty and students. That experience continues today, as documented by Mackenzie Stagg and Emily McGlohn's paper, "Rural Studio and the Front Porch Initiative: The Opportunities and Challenges of Place-Based Research." Stagg and McGlohn's essay presents the latest Rural Studio activity by explaining in detail all the processes that involve students. By doing so, the authors delve into all the main aspects related to contemporary design-build culture and its strategic importance in community engagement. In addition, they discuss the "Front Porch Initiative." This ongoing place-based research project addresses problems of housing quality and affordability for rural communities in southeastern states. The project is identifying new opportunities for testing Rural Studio's pedagogical model in contexts other than Alabama and through a broader network of partners.

Echoing Rural Studio's approach, Felipe Mesa and Miguel Mesa bring to light a design-build experience developed at the Facultad de Arquitectura, Universidad Pontificia Bolivariana (UPB), Medellín, Colombia. Their paper, titled "Clouds of Wood: A Colombian Design-Build Experience," offers an exploration of the topic from the reality of the rural region of Medellín, documenting four years of design-build classes focused on collaborative construction. The authors identify in the design-build approach to architectural teaching the opportunity for better investigation of construction processes in studios. The design-build format identified by the authors was particularly successful in helping students explore tectonics and wood joinery. The Clouds of Wood project also helped students gain a deeper understanding of the relationships between communities' needs, management of limited financial and material resources, environmental aspects, construction, and performance.

The range of learning opportunities implied in community engagement projects such as the Clouds of Wood is extensively explored by Michelle Pannone's contribution, titled "Agency in the Education of an Architect: Models of Engagement toward Empowering Students." The paper presents an alternative format for design studio courses and documents Pannone's Applied Digital Media class at the Marywood University School of Architecture, Scranton, Pennsylvania. Pannone's pedagogy emphasizes the cross-disciplinary predisposition of contemporary design-build classes. In this class, the author introduces students to environmental psychology to facilitate the understanding of clients' needs and expectations. Students are asked to organize and manage events of participatory planning so that the class is enriched with opportunities for social interaction and collaboration with local stakeholders. Pannone's work demonstrates the importance of active learning to help students value collaboration as a key ingredient in meaningful and socially responsible design processes.

As a final exploration of the relationship between design-build classes and community engagement, the section concludes with David Beach's paper, "Developing Intent and Application through Virtual Design-Build." The paper focuses on a virtual design-build class experience for the Hammons School of Architecture students at Drury University, Springfield, Missouri. It documents Beach's ongoing endeavors to integrate a digital representation class into a community-based project. Beach's class aims to expand the didactic opportunities provided by a precedent design study into the creation of 3D-printed

toys and virtual reality models for young patients at the Montefiore pediatric wing “The CHIL Zone” in the Bronx. In this class, students are focused on creating constructed toys and virtual models for a real client. Similarly, they are also exposed to the use of VR as a tool for the management of patients’ pain. Beach’s contribution is central for this section because it interprets design-build as an opportunity to explore the tectonics of buildings and objects through digital modeling. Additionally, it demonstrates the chance to transform a virtual representation class into design-build opportunities by clearly connecting students to the needs of clients.

The variety and richness of these essays illustrate the difficulty of defining trending methodologies in contemporary design-build pedagogy. However, the outcomes presented here stress a common scope of design-build teaching: thinking and making cannot be disjointed when implementing a collaborative and socially driven work of architecture. As architectural curricula are increasingly focused on supporting community needs and public agendas, design-build projects become the preferred context for exposing students to broader ways of practicing architecture.

Note: You may view a selection of “Engaging Design-Build Pedagogy” paper presentations online here: <https://youtu.be/oYzeSO4FEhU>

Session Papers

- p. 126** “Rural Studio and the Front Porch Initiative: The Opportunities and Challenges of Place-Based Research” (Mackenzie Stagg and Emily McGlohn, Auburn University)
- p. 139** "CLOUDS OF WOOD: A Columbian Design-Build Experience" (Felipe Mesa, Arizona State University, and Miguel Mesa, Universidad Pontificia Bolivariana)
- p. 154** “Agency in the Education of an Architect: Models of Engagement Toward Empowering Students” (Michelle Pannone, Marywood University)
- p. 166** "Developing Intent and Application Through Virtual Design-Build" (David Beach, Drury University)

Not all authors submitted papers for inclusion in the conference proceedings; below are additional papers accepted into this session.

“Beyond the Build” (Christopher Trumble, University of Arizona)

“Theory and Design-Build” (Ted Cavanagh, Dalhousie University)

"Design-Build as a Scholarship (Three Case Studies)" (Aaron Jones, Lawrence Technological University)

"Design-Build Studio: Empowerment to Confront Stereotypes" (Derya Uzal, MEF University - Istanbul, and Ahmet Sezgin, MEF University - Istanbul)

"Design-Build’s Intangible Learning Outcomes: Developing Soft Skills" (Milagros Zingoni, Arizona State University, and Magnus Feil, Arizona State University)

"Empowerment, Access, and Equity: Lessons from a Required Foundation Design-Build Studio" (Nick Senske, Iowa State University)

¹ Dagg served as co-chair of this session.

² Butzer served as co-chair of this session.

³ Cianfarani is sole author of this session introduction.

⁴ The talk is available on the Gibbs College of Architecture YouTube Channel:

<https://www.youtube.com/watch?v=oYzeS04FEhU>, from min. 4:50.

⁵ Cavanagh's talk is available here: <https://www.youtube.com/watch?v=oYzeS04FEhU>, from min. 32:15.

RURAL STUDIO AND THE FRONT PORCH INITIATIVE: THE OPPORTUNITIES AND CHALLENGES OF PLACE-BASED RESEARCH

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ABSTRACT

Harnessing the applied student research developed through design-build projects at Auburn University Rural Studio, the Front Porch Initiative aims to develop a scalable, sustainable, and resilient process for delivering homes in underserved rural communities. Student research forms the basis for the Initiative's work, which extends its reach and impact through collaboration with housing providers and policymakers.

A unique process of prototype home development and versioning of the homes engages students in the research of home affordability at different points in their architectural education. Graduate students undertake a comprehensive project: designing, developing, and ultimately building a prototype home for a local client in Rural Studio's West Alabama service area. Third-year undergraduate students then utilize those prototypes for in-depth study and development of a specific topic related to contemporary issues in housing, such as accessibility, energy performance, material research, or emerging building technologies. Faculty working through the Front Porch Initiative can synthesize that information and deliver it as products to housing providers outside of Rural Studio's service area.

Currently, student research is driven by the particular demands of creating housing in the rural communities of West Alabama. This provides students the opportunity to deeply investigate and respond to local conditions, a key component of Rural Studio's teaching pedagogy. However, as the Front Porch Initiative continues to expand the geographic, climatic, and sociocultural footprint of the housing research, Rural Studio faces new and different challenges and opportunities presented by other localities. As the Studio moves forward, it works to better understand how the local and particular can inform a broader conversation on rural housing while educating the next generation of citizen architects.

Keywords: Affordability, Design-Build, Housing, Place-Based, Rural

1. INTRODUCTION

Established in 1993, Auburn University Rural Studio gives architecture students a hands-on educational experience while assisting the underserved communities of Alabama's Black Belt region. A fiercely place-based program, Rural Studio operates within a 25-mile radius of

its home base in Newbern, Alabama. During their third and fifth years of undergraduate studies, as well as a through a new Master of Science in Architecture program, Auburn University architecture students have the option to move off the main campus and relocate to Newbern (an approximately 2.5-hour drive west of Auburn University) for an immersive design-build experience. The Studio engages in projects that promote sustainable rural living, providing architectural works focused on housing; education; safety and welfare; health and wellness; and food access. Students design and build projects with varied scales and programs, including homes, community centers, farmers' markets, a library, a fire station, and a town hall, totaling over two hundred built works to date.

After twenty-six years of performing place-based learning, Rural Studio is pursuing opportunities to extend its research agenda beyond the on-the-ground student experiences. Through the Front Porch Initiative, the Studio is beginning to externalize its housing affordability research. This paper examines Rural Studio's applied research methods and strategies for disseminating the research outcomes to a broader audience. It also considers the transfer of knowledge between external partners and place-based student researchers. To begin, the paper summarizes how the consideration of housing design has evolved over the Studio's history, beginning with singular client homes and into the development of prototype homes through the 20K Project. Examples of prototype development, refinement, and variations illustrate the iterative nature of the homes. Next, the paper articulates how student work from Rural Studio is disseminated to an expanded network through the Front Porch Initiative. Finally, the paper posits how external feedback might influence the place-based work of the Studio, creating both opportunities and challenges.

2. THE EVOLUTION OF HOUSING PROJECTS AT RURAL STUDIO

Rural Studio began by designing and building homes for families in the underserved communities of Hale County. The Studio's first project was a new home for Shepard and Alberta Bryant to replace their substandard residence. The designs of this and other early client homes were specific to the families for which they were built and were often—out of budgetary necessity—composed of found, reused, or repurposed materials. Less focused on replicability or affordability, the homes were a recognition that good housing is not always affordable, but that people deserve it anyway. When successful, the homes were reflective of their climatic and sociocultural contexts, featuring raised floors, high ceilings, big roofs, and large outdoor rooms (Figure 1).



Figure 1: The Harris "Butterfly" House features a large roof that collects rainwater and a sizable porch for outdoor living. (Timothy Hursley)

After years of designing custom homes for local families, the Studio began to question if the resources put into the projects could be used to affect greater change. As a land grant institution, Auburn University has a mission to improve the lives of the people of Alabama and beyond. Following the university's service and outreach mission, in 2004, Rural Studio began development of the 20K Home, an affordable, replicable house prototype. The original goal of the project was to design a home that could be built for \$20,000, the estimated loan that a person living on mean social security could afford through the USDA 502 Direct Loan program. However, as the project has continued to evolve, the Studio's focus has shifted to examining the total cost of homeownership: both the cost of construction and the ongoing costs of operations and maintenance.

The 20K Homes still integrate concepts from the first client homes, such as resourceful use of materials and attention to local social conditions. Like the client homes, the 20K Homes learn from the vernacular buildings of the area, with many featuring large roofs with generous overhangs to protect and shade the walls, high ceilings and cross-ventilation for passive cooling, and pier-and-beam foundations to protect the homes from water and pest intrusion.

Since 2004, over twenty-four prototypes have been designed, built, and given to local community members. Each prototype is named after the homeowner for whom the home was first built. These prototypes serve as a growing library of local case studies for new students, who study the previous homes before designing a new prototype. Over time, the designs have been refined and influenced by many voices, including student teams, faculty advisors, professional consultants, and clients. By focusing on a variety of spatial conditions, client needs, and potential site arrangements, the prototypes form a Product Line of homes (Figure 2). While each new student team works to develop a new design, they both improve upon past research and work to create designs that expand the client base that the homes can serve.



Figure 2: 20K Home prototypes. From left to right: Dave's, MacArthur's, and Joanne's Homes (Timothy Hursley)

3. 20K PROJECT

The 20K Home began as and remains a student research project. Depending on year level, students interact with the project in different ways. Graduate students design and build new prototypes that focus broadly on issues of equitable, efficient, and affordable housing. Third-

year undergraduate students create variations of the existing prototypes and alter them through deep analysis of the needs of a specific client and site. The feedback loop between third-year and graduate students fosters continuity from year to year and provides a framework for refining ideas.

3.1 Graduate Projects

At the graduate level, the coursework is designed to provide advanced students with a comprehensive design and construction experience. Each year, a new team of approximately four students tackles broad ideas related to increasing access to quality, affordable housing. Over the course of twelve months, they design and build a complete home. Focusing on the general needs of affordable housing, a client is not assigned to the team until after the design work is largely complete. Clients are selected for the students as the design challenge emerges, so the final product is appropriate for the individual receiving the home.



Figure 3: The student design for Ann’s Home analyzed Idella’s Home, a previously designed prototype, to compare the actual placement and use of furniture in the house (right) as compared to the design assumptions (left). This analysis influenced decisions about adjacencies and door sizes in their design. (Auburn University Rural Studio)

The concepts graduate students use to develop their design brief are based on observations of need, aggregated data, and experience gained from previous projects. For example, Ann’s Home focuses on aging-in-place and the changing needs of an individual living in one home over the course of his or her lifetime. Design features such as wide-set doors, an accessible bathroom, and bedrooms with increased connections to living spaces ensure that occupants are still able to comfortably participate in family life as they age. Studying the use of previous homes influenced their home design (Figure 3). Often, students can create linkages between seemingly unrelated issues through their designs. In another project, Turner’s Home, students used ANSI A117.1 and ADA guidelines to design a home that could accommodate individuals with ambulatory disabilities. The raised home features a ramp integrated into the front porch (Figure 4), a roll-in shower, and increased clearances and turning radii throughout the house. Intelligently, the student team recognized that if a

home is designed to accommodate a person with an ambulatory disability, then that person may have trouble seeking shelter during a storm event. The year before Turner's Home was designed, a series of exceptionally strong tornadoes devastated parts of West Alabama. While some local communities have designated shelters, they can be miles away in rural areas, which can be particularly challenging for elderly or disabled individuals to get to. Therefore, Turner's team designed an above-ground tornado shelter, following FEMA guidelines, which is accessible from inside the house. The ability to shelter in place for homeowners with limited mobility makes a home more livable and life more resilient.



Figure 4: Turner's Home pairs ambulatory accessibility with a tornado safe room. (Timothy Hursley)

3.2 Third-Year Projects

Each semester, around ten to fifteen third-year architecture students move to Newbern and work on a single project as a studio team. Each two-semester, nine-month academic year, students build one house for a local community member. Building on the technical coursework taught during their second year, the third-year students are able to apply lessons of structural, environmental, and material assembly design to a real building. Students engage with a real client and site, performing a methodical analysis of client need and field conditions. These projects contribute to the larger body of 20K research by testing alternative structural strategies, enclosure details, and plan layouts based on their analysis of the site and client.

Third-year students study narrow, yet deep architectural issues. Focused design problems, such as alternative foundation systems, allow the students to fully engage the design of details. Using wood frame construction in third year teaches students basic construction skills and prepares them for alternative and more advanced systems in their fifth year of study. Practically, starting with a prototype helps the Studio meet its goal of completing the house on schedule. The focused third-year research can compare and analyze the built details and performance of the existing prototypes, quickly test and improve alternative architectural details, and record and catalogue alternative systems for future study.

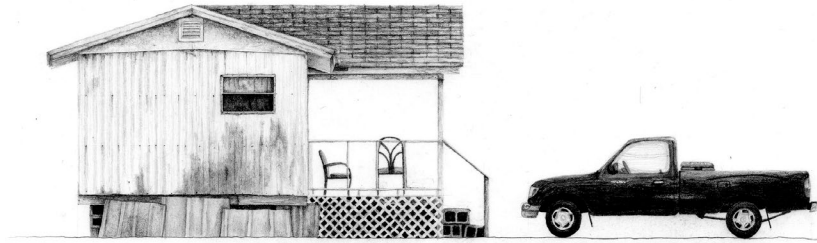


Figure 5: The north elevation of Ree's previous home. Her porch surfaced as an important aspect to her lifestyle and is evidenced by the chairs. (Will Hall, Auburn University)

Design Process

The relationship with a real client is key to the third-year research (McGlohn 2019). Students meet their client at the beginning of the design process and work closely with the client to determine which 20K prototype is most appropriate for the project. The first step in the third-year's research process is gathering information about the 20K Project prototype houses. This process runs in groups; students study the construction documents, design intent, home performance, and the successes and weaknesses of the prototypes. Concurrently, students gather information about the client's lifestyle and study his or her existing home for clues about patterns of life. They record what they observe through meticulous, hand-rendered elevations that highlight particular aspects of life that translate into design criteria (Figure 5). Often, these observations become evidence for careful plan modifications, door arrangements, or porch configurations that respond to the particular needs of the client. This close observation of how clients use their current homes frequently improves the usability of the prototypes.



Figure 6: Ree's Home. Her porch remains an important aspect of her life. (Timothy Hursley)

For Ree, having a street-facing porch is an important part of her lifestyle. A version of Joanne’s House was modified for Ree after renderings and interviews highlighted her patterns and desires, and an analysis of the prototype homes showed Joanne’s to accommodate those patterns most closely. Adjustments to Joanne’s Home included the addition of a ramp up to the porch and a direct connection to her sister’s house next door. The foundation was also swapped from a pier-and-beam system to an elevated slab. This allows for a more reasonable ramp length, only having to climb 15 inches instead of 36. Two closets were added in the floor plan. An energy heel truss was used to increase the insulative value at the wall-to-ceiling connection. Ophelia, another third-year client, sleeps in her living room because she feels safer and likes to keep the television on at night. Her son also lives with her and helps maintain the house and yard. Although Ophelia’s new home will only be a one-bedroom house, her son will move in with her. To accommodate this beneficial arrangement, a “quarter bedroom,” which is simply a small nook in the living room for her daybed, was added, and the back door was moved to the bedroom. This allows her son to come and go to work without disturbing Ophelia at night. Exploring new plan arrangements that support various living arrangements makes 20K Homes more versatile and resilient. Students learn to make judgements based on the core values of the 20K Project.

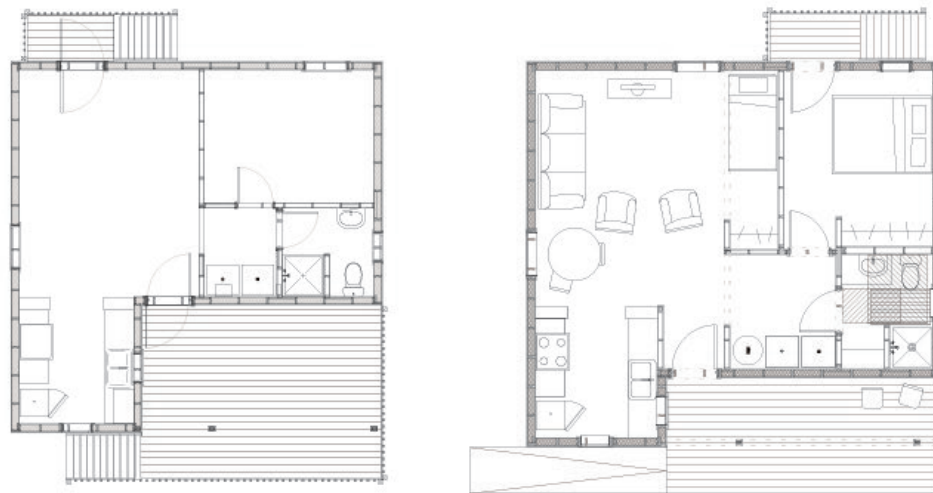


Figure 7: Joanne’s Home and Ophelia’s Home. A sleeping nook was included to accommodate her daybed and long-term overnight guests. The bathroom now meets FHA size requirements. (Auburn University Rural Studio)

4. FRONT PORCH INITIATIVE

Front Porch Initiative—an outward-facing branch of Rural Studio—is dedicated to addressing housing quality and affordability while promoting homeownership in rural communities. Funded through contracts and grants, the Initiative provides added capacity to Rural Studio; the work is *in addition to* the Studio’s academic mission. Built on sixteen years of place-based research, Front Porch Initiative has developed a three-pronged approach to addressing housing affordability. First, the Initiative offers *products*—in the form of prototype designs—that link home performance to affordability. Second, the Initiative advocates for *policies* that facilitate equitable opportunities for homeownership. And third, the Initiative works with *partners* to extend the impact of Rural Studio’s housing affordability research.

Through Front Porch Initiative, Rural Studio's reach has expanded to a regional area that encompasses the southeastern United States. Through a series of "field tests," Rural Studio engages with housing providers, also referred to as "field test partners," by supplying the partners with house prototypes and technical assistance. In exchange, the field test partners agree to work closely with Rural Studio, providing feedback and data about project implementation. Currently, Front Porch Initiative is actively engaged in projects with housing providers in Alabama, Florida, South Carolina, and Tennessee. Additionally, the Initiative works with governmental, industry, and subject matter experts to engage the nonarchitectural barriers to housing affordability, including financial, insurance, and land use considerations. The relationship between Rural Studio student research, Front Porch Initiative, housing provider partners, and housing policy stakeholders is defined by reciprocal knowledge building and information sharing (Figure 8).

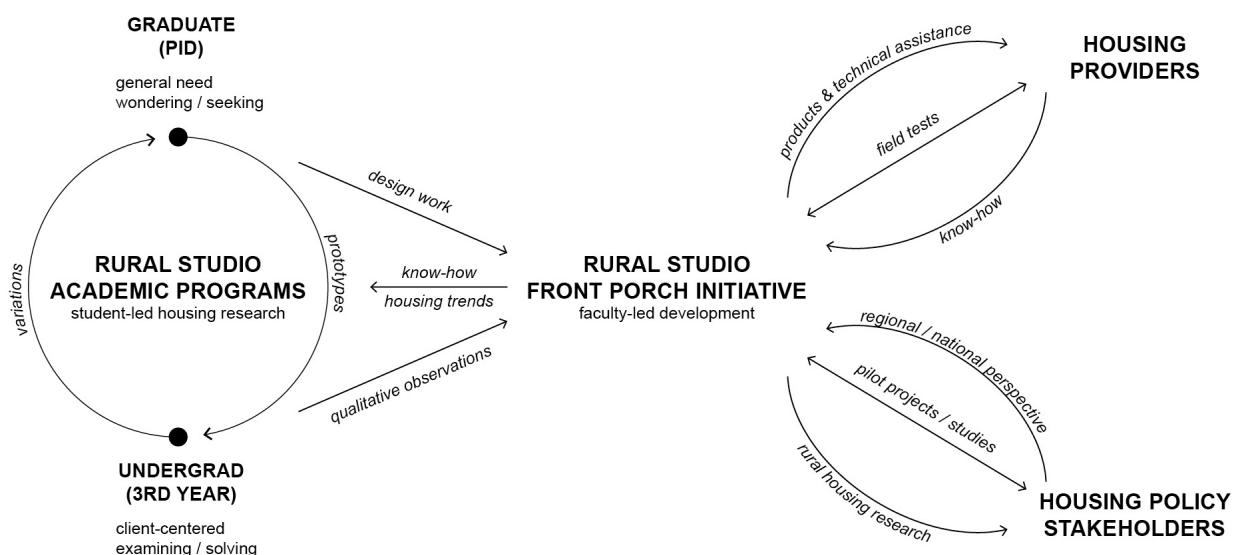


Figure 8: The Front Porch Initiative facilitates the exchange of information between Rural Studio and a larger network of housing providers and policymakers. (Auburn University Rural Studio)

4.1 Project to Product: Disseminating the Research

The Front Porch Initiative builds from a vast body of student research collected over sixteen years of place-based learning. The research includes both the iterative design work and associated prototypes as well as qualitative observations about rural housing patterns and conditions. Both the designs and the contextual information are aggregated, synthesized, and disseminated to external organizations focused on housing.

Design research from the Graduate and Third-Year Programs is transferred to the faculty-led Front Porch Initiative team, where it is adapted for use with field test partners. This is an ongoing and dynamic process, with the work continually informed and evolved through the most recent student projects. For example, as material selections, building assemblies, and detailing are refined at Rural Studio, those findings are integrated into the expanding library of information that the Front Porch Initiative utilizes when working with housing providers. As a design-build program, Rural Studio's research not only covers the design aspects of the home but expands beyond the conventional purview of the architect into the means and

methods of construction. For example, just as the design of a building assembly can be refined to improve its thermal performance, the process of constructing that assembly can be refined to streamline coordination between trades, shorten the construction schedule, or facilitate other construction management outcomes.

Work with field test partners has also necessitated the development of additional details that accommodate best practices across multiple states, adopted building codes, climate zones, and housing delivery models. The complexities of implementing prototype homes in an increasing variety of situations allows both faculty and students to reassess and reimagine the concept of a “Product Line” of homes. Instead of containing rigid, unalterable designs, the evolved Product Line provides a flexible framework of elements that can be applied across home prototypes, providing a range of variations that tailor the homes for individual housing providers, clients, and sites.

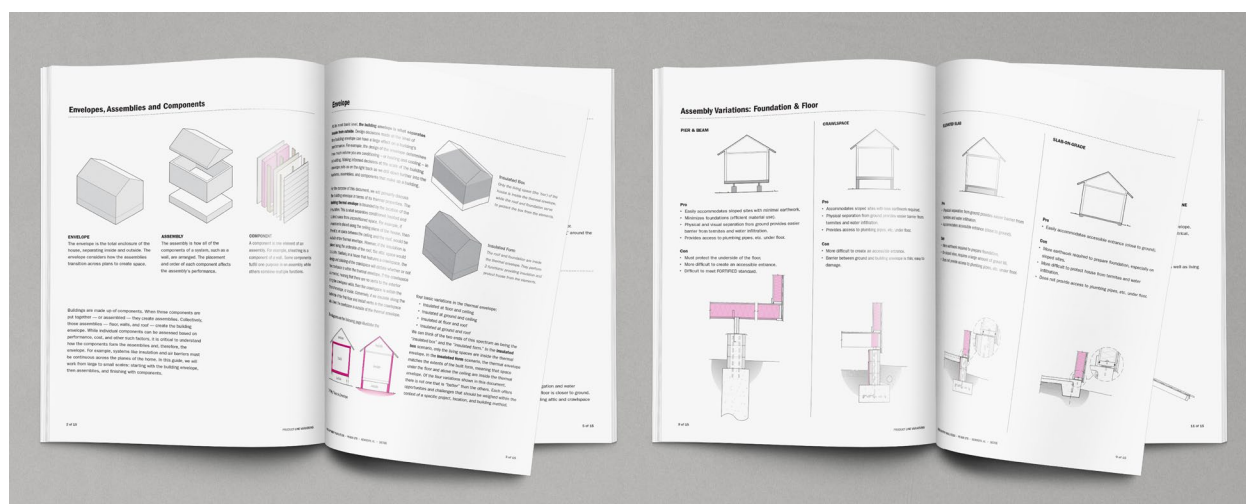


Figure 9: Design variations are described in documents intended to plainly convey technical information to field test partners. (Auburn University Rural Studio)

The Front Porch Initiative team is responsible for synthesizing the designs of the homes, along with their variations, and communicating the design intent to field test partners. This process begins by analyzing the field test partner’s needs and communicating the opportunities and challenges of different design variations. Documents such as the Product Line Variations booklet are utilized to provide context and criteria for making design decisions (Figure 9). Once elements of the home have been selected, a drawing set specific to the project is created. Finally, the Front Porch Initiative incorporates knowledge of building construction into documents that illustrate not only what to build, but how to build and—most importantly—why things should be built in a specific way. The Construction Resource is part of the set of documents provided to field test partners alongside construction documents (Figure 10).

In addition to the design of home prototypes, Rural Studio’s applied research offers valuable transferable research that informs a larger understanding of rural housing. In many ways, the object of the house provides a way to illustrate unseen linkages, patterns, and systems. These observations, gained through years of living and working in rural West Alabama, provide insight into the specific challenges and opportunities of rural living. Though observed locally, many of these concepts translate to other rural communities

across the country. For example, many of Rural Studio's clients live in settlements of multigenerational kinship networks on property passed down from ancestor to descendant over many decades. These kinship networks provide a source of resilience for the extended families through sharing of resources such as food, transportation, and childcare. Accordingly, if the network is disrupted or separated, the negative effects can ripple through the entire extended family. However, the strengths of these networks are largely overshadowed by known challenges, such as heir property, which can prevent families from leveraging traditional mortgage financing or access to federal assistance programs for home repairs.

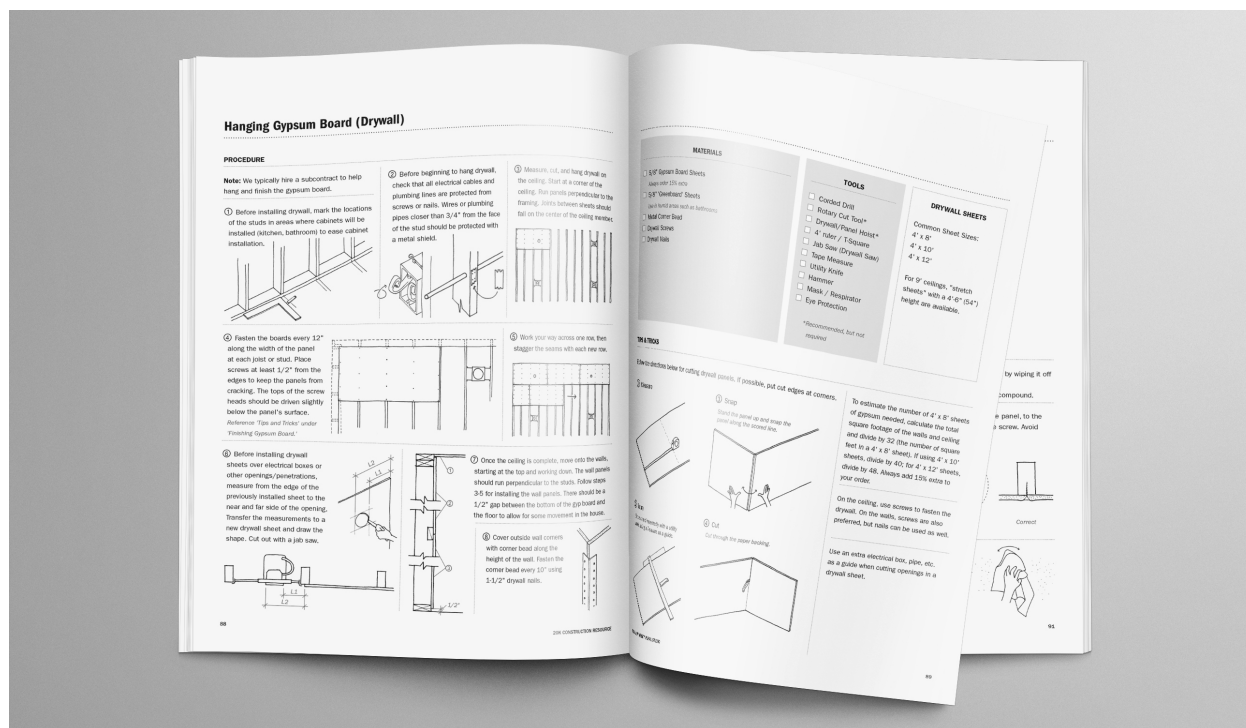


Figure 10: The Construction Resource walks field test partners through how to build and why things are built a specific way. (Auburn University Rural Studio)

The breadth of Rural Studio's community work also allows the program to better understand the systemic nature of housing affordability. For example, in 2004, Rural Studio completed construction of a firehouse for the newly formed Newbern Volunteer Fire Department. Though a firehouse is seemingly unrelated to housing affordability, the availability of fire protection services made homeowner's insurance more readily available and affordable, which, in turn, lowered the barriers to entry for acquiring mortgage financing for local homeowners. Intimately understanding the obstacles to housing affordability is the result of Rural Studio's long-term commitment to living and working in rural West Alabama. By sharing insights into the challenges and opportunities with other stakeholders, Front Porch Initiative is advocating for policies conducive to rural housing.

4.2 Product to Project: Incorporating External Feedback

In addition to collecting and disseminating housing research to a broader network of partners, Rural Studio benefits from information shared by external partners. This comes in the form of knowledge of design and implementation of high-performance homes and through a regional and national perspective on housing and available housing resources. Taking what the field test partners learn and working to create new learning objectives for students is the faculty's responsibility to continuing the applied research.

The transference of knowledge to know-how, through the designing and building of a structure is a key learning outcome for Rural Studio students. In the same manner that students learn from the built projects that precede them at Rural Studio, the homes built by field test partners expand the knowledge base and library of precedents for future student teams. Working with multiple partners also facilitates the testing and evaluation of scenarios in an expedited manner, allowing evaluations of outcomes to happen in a more timely manner. For example, in partnership with a Habitat for Humanity affiliate, two versions of the Buster's House prototype were completed: one built to meet Passive House (PHIUS) energy standards and the other to Zero Energy Ready Homes (ZERH); both homes were also built to FORTIFIED Home Gold standards for High Winds. These projects not only supplied quantitative data tabulating the costs of the beyond-code features but also provided valuable insights about the detailing and sequencing of the projects. Through documentation of the field test projects, future Rural Studio students have access to more precedents for building assemblies (Figure 11), budgetary information, and data on high-performance homes. Continued post-occupancy monitoring of these projects will also provide the Studio with confirmation of the efficacy of the designs.

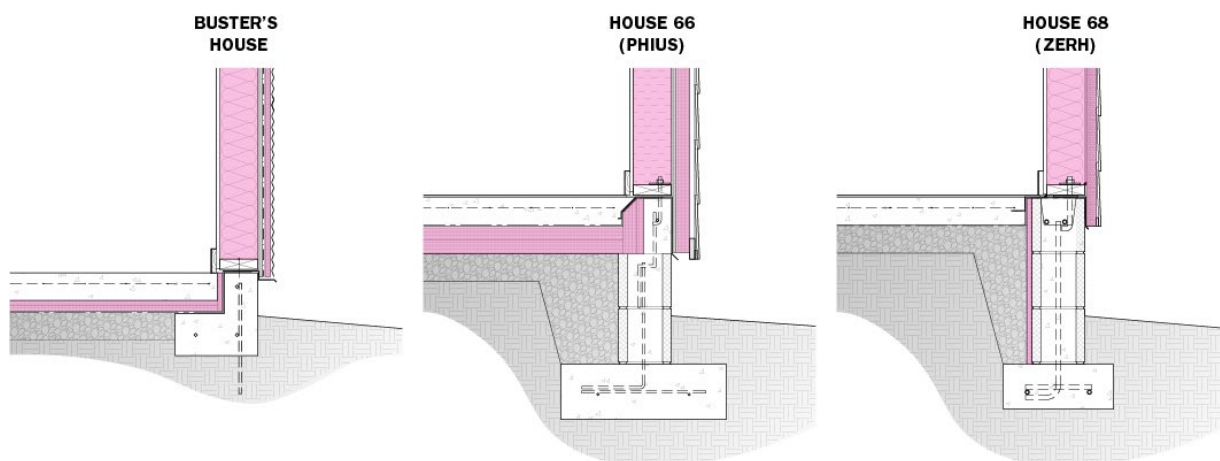


Figure 11: Foundation detail comparison between three versions of the same house prototype (Auburn University Rural Studio)

Rural Studio also benefits from a larger national perspective on housing affordability. The research of regional and national organizations helps contextualize what Rural Studio observes in its own local communities. It also exposes Rural Studio to some of the paths other communities are taking to address the challenges and barriers to equitable homeownership. This context has allowed Rural Studio to sharpen and reinforce its understanding of the places in which it works and to clarify the mission and value of its

projects. For example, Rural Studio's understanding of the unique value of homeownership in rural areas has been better articulated through contrast with urban settings. In urban places, the value of the home is typically derived from the value of the land on which it sits. Capital is extracted when the homeowner sells the home and gains from the appreciation of land value. In contrast, the value of rural lands is typically fairly stagnant and, therefore, the homeowner does not gain as much benefit from a reliable increase in land value. Instead, the asset is the home itself, through its ability to be passed down to descendants, building wealth over generations. Through this context, Rural Studio can advocate for the importance of creating quality, durable homes that are an asset for their owners for generations to come.

5. CONCLUSION

The integration of research gathered through the Front Porch Initiative into Rural Studio's student projects is ongoing, but the work has shown pedagogical advantages for undergraduate and graduate students to work together in collaboration with a larger research agenda. Both academic outcomes and research findings have benefited from the relationship. The applied, place-based research performed at Rural Studio contributes to the body of knowledge and research related to housing affordability and sustainable rural living. With rural America accounting for approximately 21 percent of the nation's population, rural housing is frequently overlooked in national conversations about the current housing affordability crisis (George et al. 2012, 11). However, the unique character of rural housing requires different approaches and responses, and Rural Studio's applied research in this field holds value outside of the outcomes it generates for its students and community members.

However, Rural Studio's primary mission is the education of architecture students, and all projects and research efforts must create opportunities for meaningful academic investigations appropriate to the year level and course of study. Rural Studio has been located in the same area of West Alabama since its establishment in 1993. The Studio is built around the importance of working in and learning from that specific place. When integrating inputs from other geographic, climatic, and cultural places, how do we ensure we remain focused on local communities?

The methods and benefits of collecting and disseminating products and data from Rural Studio's place-based research are apparent in the work of Front Porch Initiative. Yet methods of incorporating outside feedback into Rural Studio's coursework still require careful consideration. Influence from field test partners will enrich research efforts, but a strategy must be developed to make thoughtful adjustments that will not diminish the immersive nature of the work. As information sharing continues, Rural Studio will work with students to distinguish between the universal and the particular, continually sharpening the research questions.

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CLOUDS OF WOOD: A COLOMBIAN DESIGN-BUILD EXPERIENCE

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ABSTRACT

The idea of complexity in the teaching and practice of architectural design is linked to formal processes or their programmatic features, leaving aside relevant aspects of the complete cycle of an emergent building: the relationships with the communities involved, management of financial and material resources, technical designs, environmental qualities, construction, and performance. In this way, too much relevance is given to the production of architectural representations and the student's individual work, in detriment to the real impact that the student's activities may have on our society. In the Clouds of Wood Design-Build Studio (Medellín, Colombia, 2013–17), complexity was understood as the passage of a team of two professors and thirty students through the stages of design and construction of small-format buildings, made in association with rural communities near Medellín and a local company specializing in building with immunized wood. Constructions with a light program, low cost, and high impact on the communities' daily lives were agreed on between all parties. Excessive production of drawings, models, and simulations was avoided, and collaboration between students, teachers, community leaders, representatives of municipal governments, and construction instructors was encouraged.

In each semester of this course (ten studios in five years), the students worked in an articulated way in five groups with defined roles and responsibilities (fund-raising, drawing, wooden models, budget, construction). They only drew plans after knowing in depth the materials and construction technologies to be implemented; they only designed after visiting the communities involved; and they only built after understanding the budgets and the various constraints in play. If in a traditional design studio the students spend at least 80 percent of their time in activities of representation, often disconnected from everyday reality, in this course, they spent half of their time in meetings with experts and leaders, generating not only a balance in favor of the project but also a limited number of precise drawings. The course ran in four one-month modules: the first one to define in a group the overall aspects of the design (program, size, location, qualities) and evaluate five variants; the second, to develop the chosen design proposal; the third, to plan the construction phase; and the last, to build and inaugurate the building with the community. The result was the creation of a family of permeable buildings that are resistant and adapted to the tropical climate; have minimal geometric, structural, and tectonic variations; and made use of the constructive advantages of immunized wood. In addition, the consolidation of a group of students committed to the particular problems of communities, who can propose necessary, relevant, and unexpected buildings, raised the question about what is significant or even radical, today, in the education of architectural design: (a) the exploration of worlds (not yet seen)

through images and models, or (b) the incorporation of design into the (already existing) complex and restrictive dynamics through a built architecture project?

Keywords: Communities, Complexity, Permeability, Tropics, Wood

1. INTRODUCTION

The work presented below was carried out in the Clouds of Wood Design-Build Studio of the Universidad Pontificia Bolivariana (UPB) School of Architecture in Medellín, Colombia. During five consecutive years (2013–17), two professors and a group of thirty students in each semester worked together in partnership with the administrations of San Vicente Ferrer and Támesis, municipalities of the department of Antioquia in Colombia, and with the local company Serye, which is dedicated to construction with wood. Based on the social mission of UPB, and emphasizing collaborative work, we built two small-scale projects each year, leaving a tangible benefit for these rural and underserved communities.

San Vicente Ferrer is an agricultural municipality located in the eastern part of the department of Antioquia, 48 km from the city of Medellín. It has 22,000 inhabitants, and the vast majority are farmers (fruit, bean, potato, and corn crops) who visit the urban area on weekends to sell their products. This region has a cold climate without seasons, constant throughout the year. Támesis is a tourist and agricultural municipality located in the southwest of Antioquia, 65 km from the city of Medellín. It has 16,000 inhabitants, the majority of whom are farmers (coffee, banana, cocoa, and fruit crops). However, recently, tourist activity has begun to be significant due to the spring climate and the exuberant nature of the region. A traditional local architecture of houses with a central courtyard, large perimeter corridors, and simple materials (bricks, wooden columns, gabled roofs, and clay tiles) exists in both municipalities. In recent years, and due to its low cost and maintenance, light architecture, built with immunized Caribbean pine wood, has become an essential option for constructing small-format buildings in these municipalities: kiosks, pavilions, bridges, viewpoints, decks, classrooms, and so on. By building a relationship of trust with the Secretary of Education (Gloria Giraldo) of both municipalities (2013 to 2015 in San Vicente Ferrer and 2016 to 2017 in Támesis), it was possible to determine the needs of several educational communities and to propose new small-format buildings in immunized wood for their use:

- Semester 1/2013: Auditorium (Roof and steps for the courtyard of the cultural center)
- Semester 2/2013: Sunshade (Cover, cladding, and structural reinforcement for a soccer field grandstand)
- Semester 1/2014: Community house (House for peasant farmers)
- Semester 2/2014: Bleacher (Stand to connect a school and a community center)
- Semester 1/2015: Outdoor meeting area (Covered space for classes and games in a small rural school)
- Semester 2/2015: Lobby (Covered space for multiple activities in a rural school)
- Semester 1/2016: Covered walkway (covered space to connect existing classrooms)
- Semester 2/2016: Decks (Outdoor platforms for music classes and watching sports activities)
- Semester 1/2017: Theater (New roof for an existing outdoor theater)
- Semester 2/2017: Social pavilion (New covered space for community meetings).

2. DISCUSSION

During the development of these projects, we understood the idea of complexity in architecture not as a problem of size, combination of programs, or formal challenges, but as the complete path that each student takes along the material and social cycle required by any architecture that is built. In each studio cohort, we defined the program and chose the place to intervene with representatives of the municipalities. We made design versions, explained them to the community, planned the technical networks with engineers, and managed economic resources through raffles and fund-raising. We participated in the construction, delivered the project to the community, participated in the opening and future maintenance of the buildings, and managed future publications to disseminate the work and access supplemental funding.

We proposed a secondary role for architectural representations; thus, only digital plans and a few models were made. In return, students were encouraged to invest the money spared from printings and simulations on construction. Somehow, reducing representations to a minimum allowed students to give greater relevance to the constraints that each project faced (Stonorov 2018, 1), due to the simple fact that the students spent more time visiting the place, talking with the community, understanding the technical aspects of the wood, and making the best possible use of a limited budget. Although each student attended the various stages of the process, they also found a suitable place to participate, with independent responsibilities and concrete tasks. This made a way for students not so qualified in architectural design to contribute from other vital angles of the project, some of which are often less considered in conventional design studios. Tasks such as the choice of the program were, in all cases, a matter of great interest to the students. Therefore, we tried to focus on the fundamental problems of the communities, proposing activities that they would not have expected to have. For example, if the community required a roof repair, we proposed a new auditorium covering a patio; if they needed stairs to connect two public buildings, we proposed an educational bleacher; if they asked for a platform to see sports activities, we raised recreational decks; and if they needed a new meeting room for a rural school, we offered them a classroom for the garden.

The total area of the ten buildings built over the years came to no more than two thousand square feet, at a cost of US\$200,000. Still, we estimated that within the municipalities a total of two thousand people were positively affected by the projects, including students, teachers, managers, parents, farmers, and visitors. In five years, a total of three hundred architecture students participated in this educational process.

By briefly reviewing two relevant case studies of design-build studios in Latin America, we can observe the particularities of our course with more precision. In the last year of the design-build studio of the University of Talca in Chile (Uribe 2013, 99), each student, before graduating, designs and constructs a small building for a specific community in a rural area. Each student has one year to draw, define the program, manage resources, and build. In the case of *Matéricos Periféricos*, at the University of Rosario in Argentina (Valderrama et al. 2019, 5), students from different years work together on long-term projects (two, three, or more years), designing and constructing buildings or public spaces for consolidated neighborhood communities. Projects usually have several phases, and they use donated building materials that accumulate over the years.

Clouds of Wood is only for third-year students. We work with a limited time of four months per project for the same communities and municipalities, using the same materials and construction techniques. Thus, the knowledge is cumulative, although the projects

change. During each academic period, the thirty students form five teams that work in an articulated manner throughout the course: Fund-raising Team, Budget Team, Drawing Team, Model Team, Construction Team. Each team has a leader who can make agreed-upon decisions. The course is divided into four modules of one month each. We defined the general aspects of design, program, location, and size during the first month. Then, each group proposes a version of the project. In the second month, we choose the final design version developed by the drawing and model teams, while the remaining teams hold meetings with engineers, advance budgets, raise funds, and perform other tasks. In the third month, we present the final project to the community and plan the construction. And finally, during the fourth month, we build and inaugurate the new building. The work between teachers, students, engineers, instructors, and the community is intense and collaborative.

From the beginning of the course, students know that they will carry out different activities and that it will be more critical to work collaboratively than individually. Each of them decides which team they want to participate in according to their preferences: some want to learn about construction, others about budgets, others about design, and so on. For most of the students, the building they build during this course is their first project built and the only one during their architecture education, which in Colombia lasts five years. For them, it is not only stimulating to approach the complexity of professional work but also to work for underserved communities in remote regions of Antioquia. The work done in this course benefits them because it gives them tools they can implement in courses that require further development and technical knowledge. Still, it also allows them to understand the limits of architectural design and the various constraints it faces.

The municipality representatives and the academic communities where the buildings will be built are always positive because they participate in the process: they manage and contribute financial resources and help define the program and the project's characteristics. Therefore, on the one hand, the result is not a surprise because they have followed the process and feel part of the work team. But, on the other, the new spaces surprise them, because we always provide something more than what they were expecting. We have learned that communities do not want imposed gifts but necessary projects in which they can participate.

3. CONSTRUCTION

These Clouds of Wood are light and porous constructions. They are small monochrome buildings and structures to provide shade; in them, the wood assumed minimal geometric and structural variations. Although they were built to withstand twenty years, they can also function as temporary buildings. We constructed them in tropical mountainous, humid environments at different elevations. Six were built in eastern Antioquia, in the municipality of San Vicente Ferrer, located 2,200 meters above sea level; The other four were built in southwestern Antioquia, in the municipality of Támesis, at 1,600 meters above sea level. These constructions were closely linked to the unseasonal tropics, with constant temperature correlated to elevation above sea level and bimodal rainfall. Furthermore, their permeable configurations control the afternoon sun and allow continuous cross-ventilation, protecting against the accumulation of moisture and rain.

We carried out the work with the support of the local company Serye, which provided the knowledge regarding the advantages and limitations of *pino patula* (patula pine) wood, a

species native to Mexico and introduced in South America more than fifty years ago. The crops and extraction processes are certified by local environmental entities. Their technical characteristics favor the construction of structural and secondary members at a low cost. The vacuum immunization process gives them resistance to fungi and insects for more than twenty years with minimal maintenance. The recycling of the chemical product of the immunization (Chromated copper arsenate, CCA) in a closed cycle is framed in a code of good environmental practices for immunization. However, currently, this product is being replaced by others, free of arsenic and safer for human health. This product has been banned in the United States by the Environmental Protection Agency (EPA) since 2003 for residential use. In Colombia, the use of this medium-density and fast-growing wood prevents deforestation of tropical forests and the extraction of native timber of high density and slow growth, almost all belonging to endangered species.



Figure 1: Construction processes (Students)

We discarded the use of metal connections (collars, plates, knife plates) due to cost. Therefore, we employed simple connections, such as galvanized bolts and screws through the wood, allowing for a frontal or tangential joint between primary and secondary members (columns, beams, struts, decks, and enclosures). We built the foundations using reinforced concrete pillars (diameter: 3.2 feet; depth: 6.5 feet) in which the wooden columns were embedded directly. Taking advantage of a qualified and economical local workforce, instructors and students collaborated with them to construct buildings with simple details, avoiding complexity (Figures 1, 2, 3).



Figure 2: Construction processes (Students)



Figure 3: Covered walkway connecting two school buildings in Tamesis (Alejandro Arango)

4. CATALOG OF BUILT PROJECTS

The following catalog presents the ten projects we built during a five-year period (2013–17). All have educational or recreational functions and support programs for rural communities or educational institutions in the municipalities of San Vicente Ferrer and Tamesis. In all

cases, we used the same geometry and construction techniques, trying to take advantage of the qualities of the immunized wood of Caribbean pine, widely cultivated in various regions of Antioquia. The learning objectives that supported these constructions were repeatedly the same: bringing students closer to the phenomena of design and construction, positively understanding the various constraints that arise in each architecture project, and putting architecture at the service of underserved communities, verifying its capacity for transformation. We tried to consolidate a cumulative knowledge that would allow us to act quickly and pertinently on each project.

4.1 San Vicente

4.1.1 Auditorium

Task: To improve the common spaces of a community center and repair the roof.

Background: The stepped courtyard was abandoned and in poor condition; it was being used as a warehouse. Its façade, which could have enjoyed the view of the distant landscape, was covered by a wall. The use of the patio was minimal due to the climatic characteristics of the municipality, where rain is constant.

Project: We proposed reworking the patio as a small auditorium, covering it with a polycarbonate roof and a permeable wooden ceiling to control the sun, locating lamps that allowed its use at night. We demolished the wall that was obstructing the view and installed a new stone floor. Currently, the auditorium is used as a rehearsal room for music and theater (Figure 4).



Figure 4: Auditorium in the community center, San Vicente (Alejandro Arango)

4.1.2 Sunscreen

Task: To improve the standing roof over the grandstand of the municipality's soccer field.

Background: The afternoon sun prevented good visibility of the field. The existing roof could be extended and remodeled, but we realized that it was in bad shape when we studied the metal support structure. Dismantling it involved spending money we didn't have, and it was dangerous, so we opted to repair and improve it.

Project: We reinforced the columns, covering their bases with new concrete pedestals. We added braces and extended the trusses of the metal structure toward the nearby slope, connecting them with new concrete foundations. By avoiding adding excess weight to the existing structure, we could lift a new cladding of wooden elements that works as a ceiling and a sunscreen (Figure 5).



Figure 5: Sunscreen for the grandstand of a soccer field in San Vicente (Alejandro Arango)

4.1.3 Community House

Task: To build a gathering space for farmers who visit the plaza of the municipality to sell their agricultural products twice a week.

Background: Many the farmers who live in rural areas and visit the town center to sell their products lack a place where they can recover from the trip, store their belongings, pause, have a coffee, or refresh. The only lot available to build a gathering space for the farmers was a small corner lot located ten feet below the market's level.

Project: We built a stilt house articulated to the market area, accessed from a wooden bridge. In its interior, two skylights allow access to natural light, and its rear façade has a balcony with a view of the distant agricultural landscape (Figure 6).



Figure 6: Community house for visiting farmers in San Vicente (Alejandro Arango)

4.1.4 Bleacher

Task: To connect a cultural center to a public school.

Background: Although the buildings were adjacent and provided complementary services, they were not articulated. The school students and the users of the cultural center had to look for the entrance of the other nearby building. The difference in levels between the two buildings was 30 feet.

Project: Initially, we designed a ramp that involved many columns and foundations, which was expensive. Therefore, we decided to connect the two buildings by employing a bleacher that adapts to the existing slope and expands its size at the bottom, lending itself to various activities, such as picnics, recreation, and outdoor discussions and classes (Figure 7).



Figure 7: Bleacher connecting a school and cultural center in San Vicente (Alejandro Arango)

4.1.5 Outdoor Meeting Area

Task: To provide an outdoor meeting area for a rural school.

Background: The school facilities lacked covered outdoor spaces for student activities. Parents insistently requested a space for meetings and celebrations.

Project: Instead of a conventional meeting space, we designed and built a space for the garden and placed it on the stepped floor of an old orchard, taking advantage of the slope to suggest the activities that could happen: classes, readings, games, and religious ceremonies (Figure 8).



Figure 8: Outdoor meeting area in a rural school in San Vicente (Alejandro Arango)

4.1.6 Lobby

Task: To cover the access platform of a rural school.

Background: The school was organized with a semicircular geometry of buildings scattered around a concrete and staggered platform. This space, which functioned as an arrival area and a place for recreation, was exposed to the constant rains.

Project: We decided to cover a fragment of the platform to turn its upper level into a covered hall connected to the entrance and exit of the school. The challenge was to cover as much area as possible using the fewest number of columns to avoid blocking the view (Figure 9).



Figure 9: Lobby for a school in San Vicente (Alejandro Arango)

4.2 Tâmesis

4.2.1 Covered Walkway

Task: To connect two classroom pavilions.

Background: This is a school with an agricultural emphasis, so many activities happen outdoors, but the institution lacked covered areas for recess hours.

Project: The new structure was built on a long-existing stepped platform, but its columns were located in the garden to gain interior space. The slope favored the intervention, since the space does not function simply as a place of passage but also as an elongated gathering area (Figure 10).



Figure 10: Covered walkway connecting two school buildings in Tâmesis (Alejandro Arango)

4.2.2 Decks

Task: To build a bleacher in the garden from which to observe sports activities.

Background: Although the sports area was the most used school space, it lacked support infrastructure to watch these activities, and the nearby café needed seating areas.

Project: Instead of a conventional bleacher, we decided to build five modular, staggered decks that serve as places to observe sports activities, conduct an outdoor class, or have a picnic (Figure 11).



Figure 11: Decks for outdoor teaching and watching soccer games in Támesis (Alejandro Arango)

4.2.3 Theater

Task: To build a roof for an outdoor theater.

Background: The stands and stage of an existing outdoor theater were underutilized and almost abandoned in a municipality lacking cultural infrastructure. The teachers at the nearby school requested a roof that would help reactivate the underused space.

Project: The area initially intended to be covered was very large, and our budget was insufficient. Thus, we opted to cover the stands and part of the stage areas by employing a polygonal and ring-shaped roof, which set up a small patio (Figure 12).



Figure 12: Theater in a rural area in Tamesis (Alejandro Arango)

4.2.4 Social Pavilion

Task: To build a new space for community meetings on a lot owned by the municipality.

Background: The community and its representatives, who had to meet once a week, used places such as the church or the library due to the lack of a proper meeting space.

Project: Although the community required a flexible and flat interior space, the only area available for the construction was a steep slope with a beautiful view of the distant rural landscape. Therefore, we proposed and built a horizontal stilt building on the hillside, open on one end to direct attention to the distant mountains (Figure 13).



Figure 13: Social pavilion for the community leaders in Tamesis (Alejandro Arango)

5. CONCLUSIONS

In these exercises, we built a close relationship with the rural communities and public officials of the mentioned municipalities; trust and credibility were achieved with constant effort and were an essential part of the process. The most relevant aspects from an educational point of view were having to face the environmental and social restrictions of the context, turning these into qualitative aspects of the built projects, and maintaining an open attitude to dialogue and collaboration.

Exploring new innovative worlds through suggested and personal images that usually inhabit architectural design studios had no space or usefulness on this occasion. Still, its absence opened the question about what is relevant and even radical in architectural design education today (Mesa and Mesa 2107, 8).

The ten projects carried out become more relevant when they are understood as a strategy to build permeable projects in tropical and rural regions, and as a tactic on the part of the academy to produce necessary architecture without giving up architectural design as an exploratory activity linked to its context (Figure 14).

By understanding complexity in architecture as the process necessary to build a project and not simply as a formal matter, students understood the many phenomena that can affect architecture and determine its qualities. They understood that a suitable building requires economic resources, adequate materials, pertinent construction systems, and a community that needs it and can make use of it. They were aware of the transformative capacity of built architecture and the limits of representation and drawing.



Figure 14: Projects drawn, designed, and built during Clouds of Wood Design-Build Studio (Students, Mesa Estándar, Alejandro Arango)

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AGENCY IN THE EDUCATION OF AN ARCHITECT: MODELS OF ENGAGEMENT TOWARD EMPOWERING STUDENTS

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ABSTRACT

The disparity between education and practice continues to dominate academic discourse, but oftentimes forgotten is the impact that agency plays in architectural education and, in turn, a student's presence and contributions within the future of the built environment. Integrating a haptic and tangible process with easily recognizable social implications alongside traditional didactic models in architectural education engenders a sense of empowerment and obligation to a larger social authority. How might agency drive the education of an architect? In addition to teaching technical skills, how might academia address the methods to develop students' skill sets working with and through local and political actors?

Implemented as an experimental design-build course, the intention is to enable students to apply their understanding of the design thinking process and knowledge of architectural principles in their community. The specific course that is the case study engages students across a variety of levels outside their comfort zone through collaborating with departments, administrators, and stakeholders to truly understand the inner workings of a project at the scale of a community. The outcomes, presented through a case study of an experimental course, further exemplify how architecture students employ the concepts of environmental psychology and participatory planning in action, within the context of a semester-long design-build, to create a more integrated user-driven approach to architectural education.

Leveraging the next generation of thinkers by empowering them to apply their skills for the betterment of society is critical to the future. In cultivating experiences that empower students, it is imperative to recognize each student's ability to impact the built environment, further establishing the basis of their responsibility as a designer through developing a sense of collective agency in their design education. Therefore, not only addressing but actively pursuing engagement in the context of their education transforms their academic experience from a passive learner to an active participant.

Keywords: Agency, Community Engagement, Design-Build, Experiential Learning, Participatory Planning, Pedagogy

1. INTRODUCTION

In the education of a designer, courses tend to land somewhere on a spectrum between strengthening technical proficiency and developing design sensibility. Opportunities for

students to connect their technical proficiencies on paper with the act of physically making provides an invaluable experience to gain insights on material properties, enlightening the design student in the tactile problem-solving nature of the construction site that their drawings must ultimately confront in the profession. When driven by the needs of the community, contextually their built work exists within the larger ecosystem of the local framework. By addressing architecture as a method of interdisciplinary collaboration, there are many opportunities to gain a more holistic understanding of community dynamics and the establishment of place attachment, sense of community, and social capital (Manzo and Perkins 2006, 347). Many aspects of public life lie outside of the expertise of designers and architects. With the vast scales that the profession demands, drawing from these different aspects is imperative to developing user-driven proposals.

1.1 CONTEXT

Traditionally, a design brief proposes a site and program from which students respond with an architectural proposal, often without a defined user group. These projects are highly individual, receiving feedback along the way from faculty members or invited professionals critiquing the design. This approach is problematic, as it idealizes the architect as the sole decision maker who must make assumptions about both the users and their needs without firsthand knowledge. Despite the intended user at the onset of the project, the structure of the design studio inherently creates a triad between student, professor, and brief. The model often interchangeably and incorrectly utilizes the fictitious roles of client, professor, user, designer, and critic throughout the design process. This further perpetuates the tendency for architects to latently design an ideal environment for themselves or the “client” without thinking more specifically about the variety of user groups that populate a space. The designation of an “average user” becomes problematic as the needs of entire groups are generalized with inaccurate assumptions. Throughout the design studio, communication of design ideas is conveyed primarily through presentations seeking approval and feedback from knowledgeable professionals typically in the field of architecture. In contrast, the profession requires architects to communicate graphically, verbally, and in writing to diverse audiences to execute a project.

To strengthen the intersection between technology and social impact, Applied Digital Media, an elective course offered at the Marywood School of Architecture, has been framed around a community design-build project. Contrary to a typical studio course, this design-build course offers interdisciplinary engagement that leverages the design student as a facilitator between a diverse set of actors. To supplement the students’ impeccable design sensibility and ripe technical skills drawn from their prior courses, participatory planning and environmental psychology are studied throughout the course, establishing an atmosphere and attitude that drives the collective process. Beyond the physical building context that planners work within, the social context that includes institutions and systems that operate in an area are equally important (Churchman 2002, 193). Environmental psychology is essential to this course, providing insights into the movements and motivations of users by studying beyond the physically built environment. In particular, the platform of participatory planning is a framework for creating an environment in which the motivations of different groups are better understood. The creation of spaces that “offer opportunities for social interaction amongst people from different social backgrounds” is invaluable to acceptance in communities (Lees 2008, 2464). The very act of participatory planning is a mechanism for these types of social interactions to occur, in addition to the integration of more informed

public spaces. As Churchman states, “the movement in planning towards more participatory and empowering decision-making processes is a very positive step in the direction of accommodating the needs and preferences of different groups of people” (2002, 198). This shift in the approach to design education brings to light the potential of both physical and social manifestations that result from the haptic process of engagement at various scales to achieve social impact.

An elective course that follows the completion of two introductory Digital Media courses, the purpose of this course is to extend students’ skill sets acquired in studio and other courses to design and build an inhabitable structure. This tactile approach to Applied Digital Media was introduced in the spring of 2019, posing to the students a community-driven design-build. The students and community had to navigate where their construct, ephemeral in nature, would fall as a local intervention. For inspiration they looked to follies, installations, and pavilions of a similar scale (Figure 1). Through the duration of this course, students explore how innovative utilization of digital tools has the power to transform representation in the field of design, framing representation as a means to effectively communicate design ideas with the intent to open the conversation and engage a broader audience in the design process. Both two-dimensional and three-dimensional means of making, an emphasis given to workflow, refined applications of digital tools, and knowledge sharing create the framework that allows the students to dive into this experimental environment. Students then explore the application of various technological tools for fabrication and representation along the way as a mechanism to facilitate participation.



Figure 1: Renderings to communicate the opportunity of occupying local sites with design interventions and the intent over time
(Left image by Kim Hagan; right image by Kevin Bendel)

2. NEGOTIATING RELATIONSHIPS

Focusing on design interventions that value local and professional expertise, students are challenged to embark on learning through creative problem-solving. A service-learning lens permeates the course, and perhaps the most unique outcome is the creation of relationships with the community through engagement with a variety of stakeholders in the design process. By forming these relationships, students are able to understand the responsibility of design beyond a fixed academic prompt and its role in shaping communities and impacting people. Therefore, the instruction of this type of learning experience is required to encourage experimentation and exploration to allow for breakthroughs unknown at the onset of the project. The role of the instructor is to be agile, guiding students to

experts when appropriate but ultimately allowing students to discern as a team the broader contextual, formal, spatial, and fabrication questions at their own discretion. Agency emerges when the ownership of the project and process is shifted to the students. Without the instructor as a mediator, the students must become directly engaged with the variety of stakeholders. When this relationship becomes symbiotic, the students obtain the intended course experience.

Opportunities for engagement in the design-and-build process allow insights about the diverse stakeholders to be constructively utilized. These differences include their variety of needs, motivations, and relationships with public space. Manzo and Perkins state that “it is essential for those working in community improvement and planning to better understand those emotional connections to place, how they are fostered, and how they might lead to action and effective participatory planning processes” (2006, 348). Although the students are a part of the community, they are only one user type among a myriad of people in the area. For the students, working directly with the community forces them to be engaged at the micro level, understanding the specific stories of locals and paying particular attention to the ways that design might respond. Students can learn from these interactions as they synthesize the challenges and opportunities presented. Some of their findings included stories of the history of a particular development in the area, proposed site locations, collaborator contact information, and usage mapping. Through these interactions, students came to understand that their initial qualitative analysis was based on their own assumptions, and this realization opened their minds to ways of interpreting and using the space. Working together as a group and conveying their collective design ideas to nondesigners present representation challenges the students must navigate to effectively communicate. There are benefits for both the stakeholders and the designers as they begin to understand and brainstorm the planning of their community together.

For the stakeholders, this engagement in the process can be an empowering experience as they identify an actionable process and platform through which to contribute. The nature of the process requires the community members and designers to consider the problem beyond their immediate assumptions and become empathetic to the stakeholders and users alike. Through the iterative process, community members can take ownership of their solutions while also working together to grasp the most important aspects of the problem and how they should be addressed. Just as the process relies on relationships with stakeholders, it is also important that the structure cultivates an environment where each contributor is a member of the team working toward a greater goal together. To do this, the course is planned keeping in mind an internal structure and an external framework within which all aspects of the project must come together. The internal structure simulates that of the inner workings of an architectural office (the various roles, tasks, and responsibilities shared among a team), while the external framework simulates that of the working of a project (navigating contractors, client, owner, and user).

3. INTERNAL STRUCTURE

The internal structure of the team relies on assembling a variety of diverse students across different experience levels (second through fifth year). Approximately eight to twelve students were considered optimal for everyone to have a role in the design process and final product, while maintaining a large enough group to accomplish a substantial project within a tight timeframe. The diversity of student experience levels facilitates a fruitful learning

environment within the internal structure, providing a variety of meaningful contributions to the process and project management roles that the students undertake as a team. Organization and internal coherence allow for external feedback and expertise to be incorporated along the way.

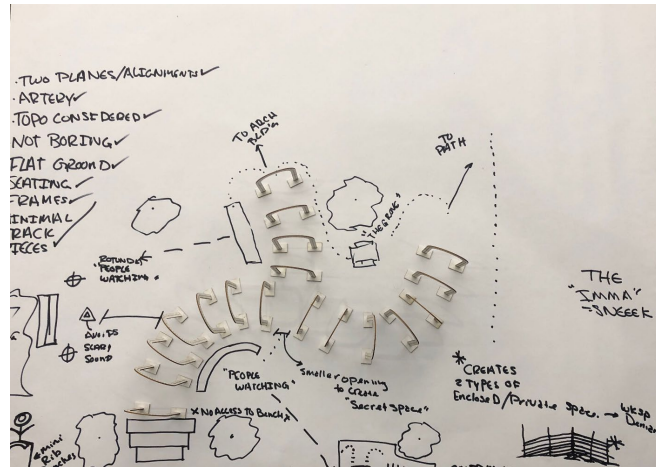


Figure 2: Working through prevailing design qualities (Photo by Michelle Pannone)

3.1 Process

The course is structured by three primary phases that do not always span a linear process. DESIGN | TEST | BUILD frames an investigative process throughout the semester focusing on an iterative approach to address both social and physical structures in the public realm. Precedents are used throughout each phase as another method of communication among the students and with the stakeholders. Given the short, one-semester timeline of the project, many aspects of the process occur simultaneously. Sometimes the final graphics are still under way during the build phase. One aspect of the design may be complete in advance of other details and head into fabrication due to a longer lead time on materials or access to machinery.

To kick-start the process, students began the first week working on their own, which is what they were most accustomed to. They each proposed areas of opportunity and potential ideas that could drive a future intervention. Quickly the students were put into pairs with classmates that had chosen either similar potential site locations or design strategies. During the third phase, they were put into small groups of three to four students to work together on a draft proposal that would convey the potential scale of the project during their first interactions with stakeholders just a few weeks into the process. Throughout each iteration, the intent and formal ideas began to emerge. Through a series of conversations, presentations, and brainstorming sessions, prevailing components from the ideas began to merge, forming the final design proposal as a product of their design sensibility paired with the engagement with the stakeholders (Figure 2). From this point forward, the testing phase commenced as the design phase continued to be explored with engagement from the community. Most of the material, structural, and fabrication knowledge was gained through the testing phase. Students were encouraged to take on a material scale and test the fabrication methods. The approach is open minded, the only rule being that nothing could be built if it had not been properly tested full scale in some

capacity. Full-scale mock-ups such as the one seen in Figure 3 invited passersby to provide feedback quite naturally. Similarly, as the building process began, it was common for someone to walk by and ask what was going on. After chatting with those working for some time, often they would ask when it would be finished, and the students would invite them to join the process.



Figure 3: Discussing mock-up with a visiting professional (Photo by Michelle Pannone)

3.2 Project Management

Project management roles commenced once the students had gotten to know one another and become acquainted with their common goals for the project. The roles consisted of Fabrication Coordinators, Documentation Coordinators, Outreach Coordinators, and Material Coordinators. Each week, as a group, they would review what had been done the prior week and delegate goals for the current week (Figure 4). The handoff and communication among peers and with professionals (obtaining quotes, ordering materials, and verifying drawings), along with working toward a unified budget and schedule, are tasks that students may not previously have realized are critical components within the scope of being an architect.

Coordinator Roles Week of 3/19

Fabrication Coordinators

- Lead charge on models and mock-up of structure/form
- Investigate possible connections

Documentation Coordinators

- (Cartoon Set) Create outline of drawings/graphics/photos needed for comprehensive drawing set.
- Begin populating with existing drawings and delegate to appropriate teams where their information is needed.

Outreach Coordinators

- Create one-page document to distribute to companies asking for surplus materials, discounts, etc.
- Who we are, what we are doing, and why?
- How we can promote their company, material, or product?

Material Coordinators

- Investigate companies to acquire materials from (priority given to local if possible)
- Work closely with fabrication to hone in on amount of materials needed and possible within the constraints.

Figure 4: Example of weekly delegated goals (Image by Michelle Pannone)

3.3 Internal Structure Reflection

The students tend to be the most comfortable during the initial design phase and warm up quickly to the pairing and grouping of design ideas as the process continues. All the pairing and grouping were done through a team consensus that resulted from discussing the design intent, strengths, and areas of opportunity. The most pushback was received during the testing phase, as the students had never been required to physically build out an idea they had proposed and have it be validated by the entire team. They would often come in small groups with a drawing and propose ordering all the materials to go forward with that fabrication method for the final construct. By the end of the project, they began to arrive at Open Studio sessions with their mock-up of the proposal and often found that team members provided valuable feedback on how to improve the strength or aesthetic qualities of the design. This collaborative nature of the project allowed students from different years to work together, harnessing their individual strengths while striving toward a common goal. They took ownership of the project quickly as they creatively problem-solved and made progress throughout the semester. As the testing and building phases began to blend together, the students had established confidence and excitement in anticipation of the final product, developing their sense of agency as designers. The Coordinator roles helped delegate tasks, but there was significant overlap when decisions were also made to level out the workload among team members. The internal structure was imperative to effectively communicate and integrate external feedback and expertise throughout the process.

4. EXTERNAL FRAMEWORK

The challenges in this course ranged from the large-scale impact on the community and integration of their feedback along the way to the small-scale details and specific means of fabrication to execute the build. The external framework primarily focuses on two main thematic areas: technical expertise and local expertise. Technical expertise is integrated in the course through consultation with industry professionals, and local expertise is gained through the collaboration with potential users. While the instructor of the course leads the charge on integrating industry professionals to consult throughout the project, the students are tasked with facilitating the integration of local expertise.

4.1 Engagement with the Profession

Relationships with professionals centered around three main areas: advice on project delivery, technological expertise, and fabrication methods. These interactions occurred in different capacities depending upon availability, location, and project needs and were guided primarily by the instructor. Throughout the course, local professionals joined Open Sessions, sharing the work of their firm, the integration of digital tools in their work, and providing an open discussion with the team. The industry professionals were often incredibly curious about the work of the students and followed up on their progress along the way, providing moments of mentorship in the execution of a built intervention. As the project continued, the needs became more specific to material qualities and fabrication methods. This required the students to reach out to manufacturers, share drawings to communicate their intent, and obtain quotes. Through these types of interactions with the professionals, students gained communication skills, articulated their intent, asked for the expertise of others, and ultimately understood some of the behind-the-scenes work necessary to execute

a full-scale project. The professionals provided valuable insights to the project while also mentoring the students and gaining an understanding of local opportunities to share their expertise with the community.

4.2 Engagement with the Community

The power of the process lies in establishing an environment where potential users become more than just a public opinion but are integral to the design process. To facilitate this, there must be both a framework to share knowledge in addition to opportunities to directly engage with the project. This has been done in the following ways: Community Workshop, updates through posters and newsletter, and consistent Open Studio and Build Sessions.

A Community Workshop at the beginning of the semester kicked off the project. Locals, students, faculty, and administrators were invited to imagine the future of nearby public spaces (Figure 5). This began the conversation and established points of contact.



Figure 5: Community Workshop in action (Photo by Michelle Pannone)

Following the Community Workshop, newsletter updates and posters were used as a method to post progress and communicate broadly with the community. Open Studios twice a week were accessible to the public as a time to work together. It was important that those interested in contributing had a consistent time when they knew people would be working on the project. After the design had been realized, Build Sessions (Figure 6) offered the opportunity to learn about the technology used to fabricate and assemble the structure. At this stage in the process, most of the learning is conveyed through skill sharing that occurs quite naturally in an effort to work toward the final product together. As they transfer skills and expertise in the fabrication method, they continue to take ownership of the project and their contributions to the team.



Figure 6: Open Studio painting session hosted by the Material Coordinator team
(Photo by Michelle Pannone)



Figure 7: Placing the final touches (Photo by Michelle Pannone)

Some participants were involved throughout all phases of the project, while others were interested in a particular aspect of the project. Providing a framework for engagement gave the stakeholders the freedom to participate as they wanted to and according to their interests, as they knew exactly when and where there would be an opportunity to join the

process. At the conclusion, not only have the students and community members seen their design proposals come to fruition (Figure 7) but with testing and feedback they have acquired a new process to address problems in the future. The students' firsthand experience of engaging with the community revealed that inclusivity in design is achieved through the direct involvement of stakeholders in the process. Through experiential learning, students gained an understanding of the important role of collaboration in the design process to achieve socially responsible design.

4.3 External Framework Reflection

The students' integration and engagement with the profession and community instilled leadership qualities while simultaneously teaching them intricate aspects of the process required to execute a built project. The students, hesitant at first, gained valuable experience on aspects of project management that included reaching out for expertise through mentorship and consultants along the way. Although the students hoped that they would develop a final design out of the Community Workshop, they instead discovered shared values and latent needs of the community and areas of opportunity begging for intervention. It was evident that the students were empowered by these interactions as they pushed themselves to learn the correct questions to ask instead of the answers they had initially thought they would find. They learned methods to bring stakeholders together and communicate with a diverse audience while leveraging their design thinking skills to incorporate a broad set of voices into the process. The students were instilled with a sense of agency as designers through not only designing solutions but also contextualizing them, solving the puzzle piece by piece by communicating with stakeholders throughout the process. Effective leaders bring people and ideas together to creatively problem-solve with the necessary voices and resources to mitigate them. The success of student leaders is a direct result of the instructor's ability to create and embody a culture that instills the role of a socially responsible architect on the students.

5. CONCLUSIONS AND FUTURE WORK

Through this hands-on course, students extended skills taught in the studio to serve the greater community by engaging campus and local stakeholders in the design process. This included challenging appropriate representation techniques for a variety of audiences to convey the evolving design intent. In the end, students established an understanding between digital craft and built precisions, all with the outcome of transforming an underutilized space in the community.

Effective designers must be strong in a variety of skills tangential to the formal design of buildings, objects, and spaces. Ensuring that the design satisfies the needs not just of a generic user but of a variety of authentic stakeholders requires a broader skill set. To holistically design, one must be able to communicate effectively with other designers and nondesigners; one must operate under a deadline and a budget; one must construct not only on paper or as a model, but at full scale and from tangible materials; one must be considerate of a variety of voices and understand that design is an inclusive process, not an end goal. In traditional design curricula, students very often operate individually and make biased or idealistic assumptions about a theoretical program and site. Although there are important aspects to these curricula, such as developing formal design sensibility, without

the integration of experiential learning opportunities, they do a disservice to the collaborative nature of the discipline and how built work is typically executed.

The most effective way for the next generation of designers to learn this skill set is to gain firsthand experience engaging with and alongside the community while working together as a team with guidance from professionals. The Applied Digital Media course provides students an opportunity to apply their design sensibility and technical knowledge to a community design-build project, allowing them to gain this experience. This course exposes students to processes more closely aligned with the profession by working alongside the community and a variety of stakeholders, ultimately granting students agency in the process that they are not inherently afforded in the traditional curriculum.

Community design-build experiences require a tremendous amount of work from both the student and the faculty perspective for a three-credit elective course; however, when offered outside of a required sequence, this course may attract students of varying levels who are truly interested in the course goals. Through experiential learning, the instructor has the freedom to address broader curricular goals through the lens of engagement, inviting professionals and community members to contribute firsthand. This removes the problem of needing to achieve specific technical requirements in the course content that may drive the formal outcome of the project. Future models could include a two-part elective course spanning both fall and spring semesters and maintaining the same cohort of students.

Early in the project, following the Community Workshop, the students developed an incredible amount of agency through discussing the potential of the site beyond this semester and creating a framework to continue to develop the course in future semesters. Sessions would extend long beyond their planned times, as the students were eager to stay late and discuss models to engage additional stakeholders, find financial support, and refine a more seamless process. At this pivotal moment, the students recognized the impact they have the potential to make in their future projects and careers by bringing their creative problem-solving skills, harnessed in their design education, to the forefront of the community (Figure 8).



Figure 8: Typical community encounters (Photo by Michelle Pannone)

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DEVELOPING INTENT AND APPLICATION THROUGH VIRTUAL DESIGN-BUILD

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ABSTRACT

The process of design-build links intention and application within a curriculum that is difficult to replicate in a traditional educational studio. While most effective in the analogue world, design-build can be simulated within a classroom by leveraging virtual reality as a curriculum connecting client, spatial immersion, precedent study, construction, fabrication, and a digital design toolset. This paper and presentation will outline a course curriculum for second-year design students at the Hammons School of Architecture that leverages the pedagogy of design-build within a virtual process. The project connects specific *intent* for our client by crafting spatial experiences for the CHIL (Children's Hospital Innovation Lab) Zone, a pediatric care unit of Montefiore Medical Center in New York that brings technology to their patients. Leveraging tools like AR (alternate reality), VR (virtual reality), and 3D fabrication, patients in the CHIL Zone are moved virtually beyond the confines of rooms when their medical limitations often reduce their opportunities for exploration. Approaching the process in a parallel modality to a design-build curriculum, student *application* happens through the construction of virtual versions of a precedent design study, including site, phasing, construction methods, details, and basic communication of the spatial concepts for their clients (kids from twelve to eighteen in a pediatric care unit). The process happens within the immersive qualities of virtual reality, creating a narrative about the architectural design that each student must communicate. Each project is resolved by finalizing a VR "docummersion" film that includes the precedent study and specific spatial elements of their own design. This process is directly generating new understandings of the design-build process. It is developing considerations of architecture and design thinking, including spatial exploration as a form of rehabilitation and health care, architectural design intended solely for use in virtual reality, and the connection of virtual reality and cognitive spatial awareness for design education.

Keywords: Virtual Design-Build, Virtual Reality

1. INTRODUCTION

What if, just by going for a walk in nature we could improve health? This issue goes beyond cardiovascular systems and muscular tonality, as there is a cognitive connection between the exploration of an environment and the well-being of a human. EcoHealth and

ecopsychology are immersing sciences—with resources counting over one thousand in medical journals within the last two decades—connecting the importance of human health and the exploration of nature. “As the nature deficit grows, another emerging body of scientific evidence indicates that direct exposure to nature is essential for physical and emotional health. For example, new studies suggest that exposure to nature may reduce the symptoms of Attention Deficit Hyperactivity Disorder (ADHD), and that it can improve all children’s cognitive abilities and resistance to negative stresses and depression” (Louv 2008, 35–36). The intersection of health and nature deficits is perhaps most striking at hospitals in dense urban communities lacking the public infrastructure and funding to build access to natural landscapes. For those without the means to access nature, being placed further into isolation due to health can be detrimental to health (Hartig et al. 2003). Barriers of place, economy, and health are overwhelming obstacles that often cannot be surpassed. The current pandemic has also increased our isolation and decreased our ability to move freely to new locations and explore. So the question becomes: Can we *deliver* the experience of nature to those who are isolated? It is reasonable to argue that we cannot move an experience of nature into a room, and that the goal of “simulating nature” through virtual reality is perhaps an overreach of moral expectations we should not strive for. However, if designers could create spatial experiences through virtual reality that imitate that sense of immersion, exploration, and discovery similar to what has been studied of those exploring nature, we could begin to replicate:

- The visual ambient intensity of a walk in nature—with spatial breadth and optic depth to absorb.
- The firing of the synapses in the brain that are engaged while you are actively exploring, which may also provide restorative qualities within your body.
- A moment of sneaky education teaching kids about space, design, architecture, and the impact of these items on humans.

Immersion “describes the effect caused by a situation, environment or graphic representation which makes the user’s consciousness recede into the background so that the virtual environment is perceived as reality” (Engelmann 2018, 21; my translation). It is this notion of immersion that is vital to building experiences that can bring positive results when used on patients struggling physically and emotionally within an area of confinement due to their medical restriction. There are already positive results in leveraging virtual reality (VR) for medical therapy:

Recent research has explored the potential of using virtual reality (VR) as a mode of healthcare intervention and an alternative route for care delivery (Mantovani et al. 2003; Simone et al. 2006). Virtual reality is a computer-generated graphical environment that offers opportunities for users to view and interact with the virtual environment in stereoscope (i.e., three-dimensional visuals). In interventions for physical impairments, VR has been proposed and utilized as an assistive rehabilitation technology for individuals suffering from stroke (Jack et al., 2001), cerebral palsy (Reid 2002), severe burns (Haik et al., 2006), Parkinson's disease (Mirelman et al. 2010), Guillain-Barré syndrome (Albiol-Pérez et al. 2015), and multiple sclerosis (Fulk 2005) among others. (Rose, Nam, and Chen 2018, 153)

Further, the use of VR as a tool for pain management has shown to be effective for treating burn patients during both recovery, operations, and rehabilitation (Hoffman, Patterson, and Carrougher 2000). However, creating a heightened sense of immersion is one of the core issues in terms of development with the current state of hardware, software, and accessibility to virtual reality content. Using VR repeatedly to aid in longer treatment cycles requires emulating a sense of exploration and discovery with similar thematic experiences. This builds a more immediate familiarity, allowing faster cognitive acceptance of immersion within the VR content. As a result of this situation, VR is at a juncture where it needs more experiences on the most accessible devices to deliver content to those on whom it may have the most profound impact. This need, opportunity, and desire to innovate in the field of medical VR led to the collaboration between the Hammons School of Architecture and the Montefiore pediatric wing known as the CHIL Zone.



Figure 1: Medical VR—Montefiore CHIL Zone (photo provided by CHIL Zone)

1.1 Content Creation

The need to create multiple hours of original VR content, combined with finding innovative ways to teach immersing design communication, led to the redevelopment of a compulsory class within our architectural curriculum. The class best suited for introducing a project to build VR content and provide an educational opportunity connected to the CHIL Zone is found in the second year of the curriculum at the Hammons School of Architecture: ARCH 222, Representation II. This course builds digital design skills as part of the workflow of the design process, thereby expanding student representation and communication capabilities. The course itself has evolved beyond “learning software” to also focus on intent and application to increase students’ critical thinking. Developing VR content for medical applications builds parallels to the mode of learning found in design-build by creating a digital immersive synthesis of a precedent project.

As with a typical design-build, creating responsibility to a client group establishes a sense of empathy and brings purpose to the development. For the medical VR project, the architecture students were also required to develop an understanding of the client and their

needs, a sense of empathy beyond merely completing an assignment. Specifically, our client is a twelve- to eighteen-year-old patient confined to a bed and mostly isolated to a single room. The goal for the client is to build a “virtually constructed” experience to create a sense of immersion through exploration, discovery, and education. This is to be done through their development of architectural spaces to create a sense of emotive displacement developed with three specific goals within the VR construct:

Ambient spatial intensity: The goal with ambient intensity is to create a construct to engage curiosity rather than adrenaline-fueled intensity. A design goal is to build a place that is familiar so as not to distress, but distant enough to engage a sense of exploration and wonder. This is the antithesis of a video game designed for “shooting zombies”; rather it is an opportunity to engage thoughtfully in a VR space.

Iterative exploration: Kids should not spend more than around ten minutes in VR, as emotive displacement can be too powerful and trigger additional side effects. As a result, we needed to design experiences that were both repetitive (kids universally adore the phrase “DO IT AGAIN!”) and iterative—with basic modifications for each experience.

Education through immersion: VR is a new media that is not likely to displace existing forms of entertainment or communication, but it will open up new avenues to express, explore, and teach through immersion.

Completing projects within a curriculum designed with the aforementioned objectives in mind, the VR experiences become by-products of the student work. This aligns with an objective in the education of digital design by focusing on process rather than emphasizing the craft of architectural imagery. A comprehensive workflow that includes digital design technology (building information modeling [BIM], digital fabrication, rendering, virtual reality, etc.) is critical to develop an understanding of a modern design process. Allowing communicative design content to evolve as a by-product first, then conclude through refinement, evolves the student’s ability to use digital tools to inform their critical thinking.

1.2 Intent and Application

Combining the goals of creating medical VR for emotive displacement with an existing set of course objectives, we began to create a new curriculum to deliver learning content with broader intentions than just completion of the assignments. The course for our second-year architectural students, ARCH 222, Architectural Representation 2, is the introductory course for constructing virtual models, BIM, digital representation, and fabrication. The mode of work for the class became the digital creation of architecturally significant precedents. This allows the students to create experiences that are relevant to their architectural education, that are engaging spaces to communicate to kids, and it creates an environment where students can focus on learning the tools while allowing their design focus to be osmotic in nature.

Continuing with the parallel modality of design-build, a specific client was identified to drive *intentionality*: twelve- to eighteen-year-old children in a pediatric wing of a hospital, primarily confined to their room, and either in a bed or a seated position. This was a client who needed custom VR experiences that were ambient in composition, evoked a sense of exploration and discovery, and included an undercurrent of education, in our case

leveraging architectural design as a common point of study and learning. The client's maximum time of VR engagement would be set to 10 minutes (a recommendation for youth in VR from multiple sources), with a total goal time of one hour for emotive displacement by engaging with the experiences. Additional elements would be needed to extend the experience past VR to further engage the patients and to spark their creativity based on their discoveries and observations in VR. The *application* parallel to design-build would come from the students' construction of a series of assignments to develop their understanding of digital content creation tools through the development of precedents: *Assignment One—Constructing Cognizance* (the creation of a precedent study board); *Assignment Two—The Design of Diagrams* (the creation of physical diagrammatic toys through digital fabrication); *Assignment Three—Details and Devils* (the construction of a BIM model); *Assignment Four—Impartation through Immersion* (the communication of a design through 2D, 3D, and immersive methodology). All assignments can be read in full on the course website at: <https://sites.google.com/view/hsa-arch-222-20/assignments>.

1.3 Constructing Cognizance

Developing an understanding of the precedent work and context research tools is the first step in developing the digital precedent for the course. The first project, *Constructing Cognizance*, required the students to identify their projects' available materials: project context, plans, sections, elevations, site plans, and the architect's design intent. Project context is studied and imported through Google Earth. The tools within Photoshop are applied for rescaling images and adjusting dots per inch to create consistency within orthographic drawings. Meaningful architectural scales are established, including site context information captured from project documentation and explorations of the context in Google Earth.

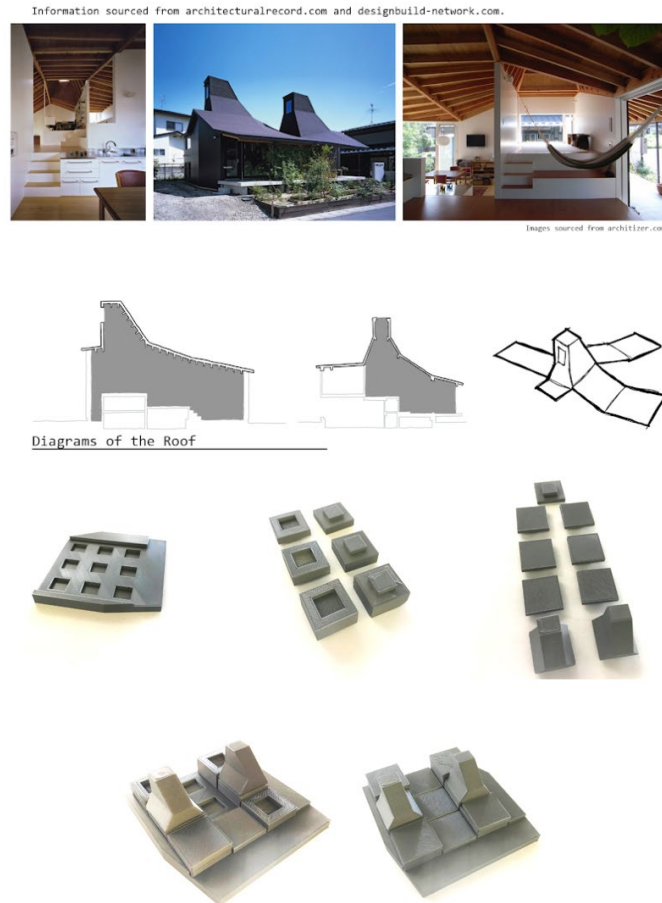


Figure 3: Diagram to 3D print, precedent project: Nora House—Atelier Bow-Wow (Hammons School of Architecture Student Isabelle Holder)

Through ongoing discussions with staff in Montefiore’s pediatric wing, we learned that the team from the CHIL Zone has several underutilized 3d printers. Each immersive VR experience would be paired to a 3D print based on the precedent. This would extend the amount of time a patient can invest in an experience and evoke their creativity beyond a passive participation. For the architecture students, this would require them to design a massing model with variations on a formal theme that could be reconstructed physically. Completion of this assignment requires that the students assess their precedent, design a three-dimensional volumetric diagram based on their precedent’s design, expand upon their understanding of a physical object to be creatively manipulated, and create a connection between virtual and physical geometries through 3D printing. The primary modeling software for the task is FormIt, with geometry being sent to Prusa printers through the PrusaSlicer software. In particular, FormIt has an easy entry point for modeling and also has tools to evaluate the preparedness of a virtual model for 3D printing. Each design required multiple passes at 3D printing to refine print time (holding the time for the prints to under four hours) and to work within the tolerance of digital fabrication. This process became very iterative for the students, printing test pieces, creating discoveries with the physical objects, and quickly revising and resending prints from the FormIt software.

In parallel with the construction of virtual and physical models is the development of the representational skill set using real-time animation software. Based on the capability of the university labs, availability of the software, and the potential learning outcomes, Twinmotion was selected as the primary visualization software. The conceptual massing model is exported from FormIt, imported into Twinmotion, and placed into a basic interpretation of the site and context of the project. This helped the students gain a more complete understanding of the site, scale, and materiality of the project.

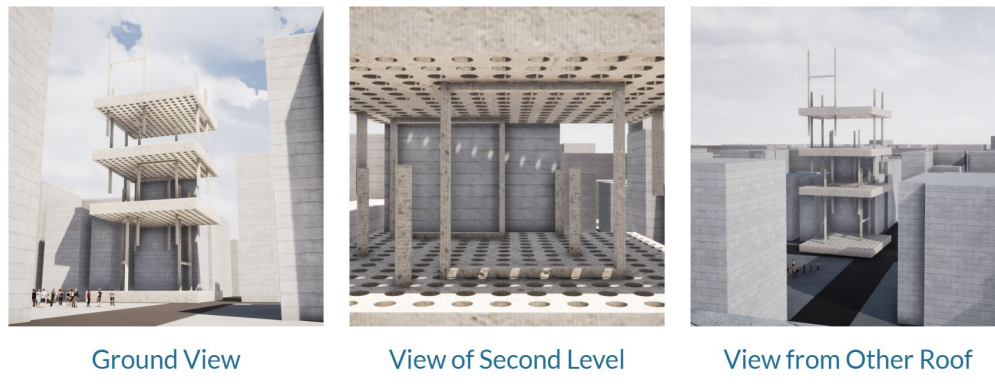


Figure 4: Diagram to visualization (Hammons School of Architecture Student Jacob McNeal)

1.5 Details and Devils

Moving from virtual massing models to BIM models with details can be tedious for most students. Working a project from a specific detail (window geometry, furniture, stair, etc.) allows for focused development that a virtual model can build around. This progression within the project develops a strategy by which students can see sequential progress happening in phases. The focus of the project is also around the less conventional architectural tools in a BIM program, allowing the student to first learn how to use software to think in 3D. This circumvents the often-used production design of BIM software working from plan view to a vertically projected building from two-dimensional planar thinking.

Developing a detail, students use the custom mass-modeling tools within Revit to model a portion of their precedent, and then deconstruct the model into 2D line work. The 2D line work is then used with a laser cutter or CNC router to create digitally fabricated patterns to reconstruct a physical version of the detail. Learning a second method of digital fabrication prepares students with multiple options for best-use scenarios, as well as diversifying their skill set.

Author's Note: Relevant to the time of this paper, on Friday, March 13, 2020, our university closed for spring break, and shortly thereafter made the determination to conclude all classes with remote learning. For my students, this meant the loss of shared workspaces and collaboration in common spaces, both of which are key to learning complex software skills. Many of my students did not have personal computers and were relying on campus labs. Those who had computers often did not have a system with the necessary specifications to run the course software. As a result, the key learning objectives were modified with a focus on understanding the core elements of working with a computer as a design tool. Many of the following images were completed as examples for the class as the

curriculum was developed and are items produced *for* the class rather than *by* students in the class.

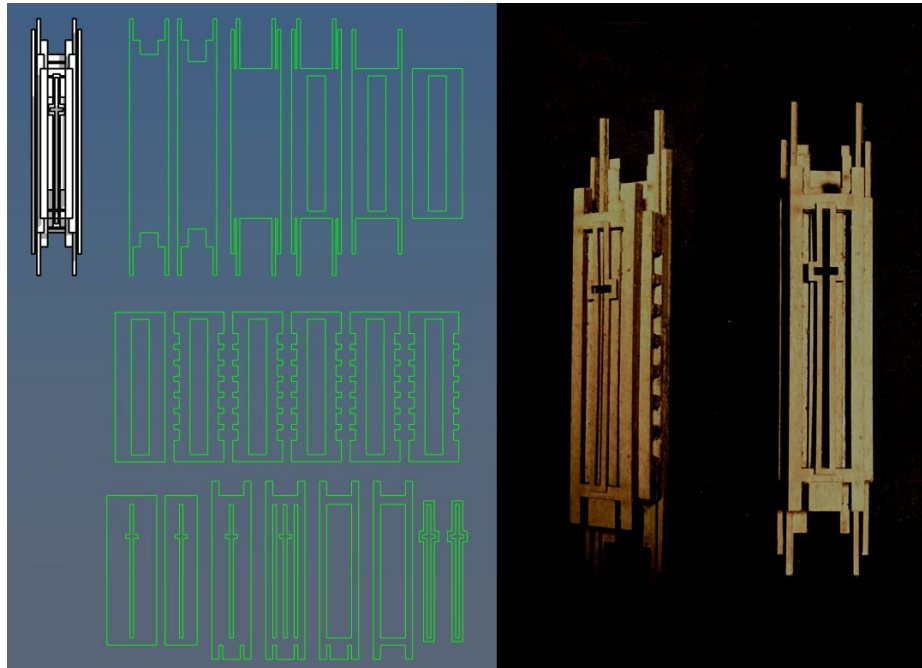


Figure 5: Detail to physical model: (left) Light fixture from Thorncrown Chapel by Fay Jones; (right) BIM detail model and fabricated physical model by David R. Beach

Building around the detail, and using this mode of design consideration to provide intent and scale, the BIM model is further developed to begin moving the design past a massing level of representation and into a more complete architectural model. By starting with a detail, a level of expectations within a digital model is established to move past the often-reviewed hollow shell of interior space developed in student projects.

1.6 Impartation through Immersion

Final development for the semester introduces the tools necessary to complete the students' precedent study as a BIM model. This portion of the semester includes the majority of the 3D work but takes place in only about one-third of the semester timeline. Previous projects have created a set of software skills that allows the work to be accomplished quite efficiently based on previous iterations of the course. The final project introduces site topography acquisition from CADMapper, the creation of orthographic project drawings (plans, sections, and elevations) from Revit, basic visualization from Revit, and immersive visualization in Twinmotion.

Within Revit, building the virtual model and constructing orthographic projection drawings are key objectives for the class. Implementation of BIM into working drawings and construction documentation takes place later in the architectural curriculum, allowing the students' effort to be directed toward understanding the process of crafting a virtual model. However, the creation of plans, sections, and elevations is a key element in communicating design ideas and is necessary to help students develop their design thinking.

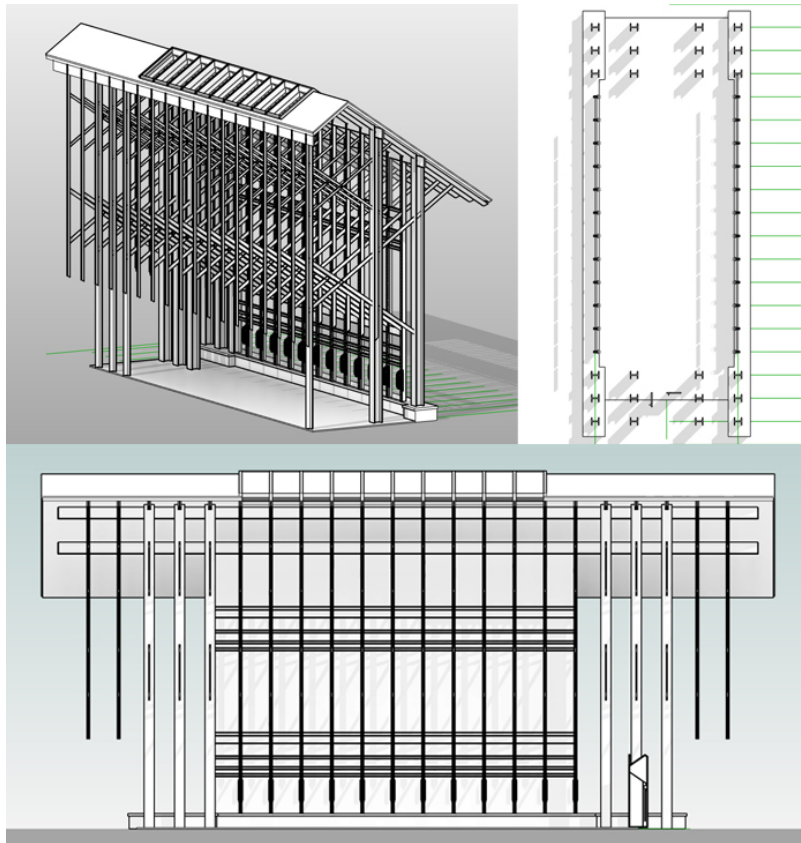


Figure 6: BIM modeling precedents: Thorncrowne Chapel by Fay Jones; BIM file and images by David R. Beach

BIM software is often not conducive to the development of material strategies in the design process. The depth of the menus and process of applying materials in BIM software has its relevance, but it is not the best mode of helping students consider materials as part of the design process. As the BIM model is coming together, continual visualization work is done in Twinmotion to develop materials and build an immersive understanding of the architecture, spatial strategies, and communication of the project. The final file is then rendered into a 360-degree animation from Twinmotion for immersive visualization in VR and distribution to a library of immersive experiences for medical VR.

2. CONCLUSIONS AND FUTURE WORK

With multiple BIM models completed, the next phase of the work is to build the documersion films showing the assets and sites to their best potential. The content will be matched with a voice-over explaining the project and its concept, with key motion paths and branching selections being developed in Adobe Premiere and Adobe Captivate. Upon completion, the files will go into their first phase of viewing and testing with the pediatric team at the CHIL Zone within the Montefiore hospital in the Bronx, New York. Currently, we have a second team of students from our computer science department that is beginning to build interactive game versions with the architecture, allowing for creation of architectural spaces inspired by the building precedents and constructed by the kids inside the VR experience. As the interdisciplinary collaboration continues, music scores developed by the

music therapy department will also be part of the final collaboration, building an ambisonic soundscape within VR that not only enhances the immersion but can also be used to further the process of healing engagement.

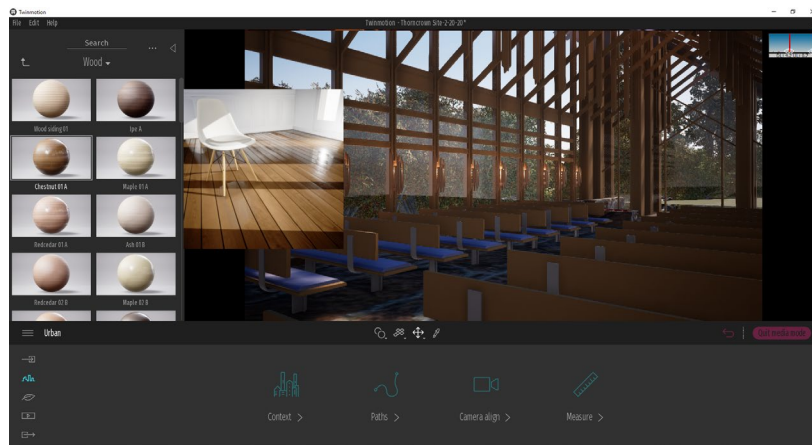


Figure 7: BIM modeling materials and immersion: Thorncrowne Chapel by Fay Jones; Immersive file by David R. Beach

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PARTICIPATORY DESIGN AND COMMUNITY ENGAGEMENT

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Since Whitney M. Young Jr. admonished the AIA for its thunderous silence and complete irrelevance in 1968, a number of “alternative” design approaches have been utilized in response: community design, participatory design and planning, democratic design, social architecture, co-design, public interest design, and others. All have slight nuances but generally strive for the same goal: those who are to be impacted by design should be involved in the process.

Today, still, participatory design or even the act of engaging communities in the discussion of design is viewed as a fringe, alternative, or “other” practice, making it wildly fitting for inclusion within the American School’s “renegade” stance. However, we argue it should not be some alternative renegade practice, since before simply “solving” physical design problems, we must work alongside clients, end users, and communities to first understand and discover what their social and cultural needs are in a project, which may entail the need for more holistic outcomes than just a building.

In rethinking design pedagogy around engaging stakeholders and/or the public in the design of their environments, this session sought to explore how to teach students not to forget how to see their neighborhoods and talk with their communities. How can we temper the enculturation process of the design professions so that students still retain a connection of lived experience to those outside the design disciplines as well as recognize the expertise of those who live, work, learn, and play in such places? How can we prepare our students to understand the context, not just the physical, but the social, cultural, racial, historical, and political? How do we instill in them this openness so that it carries through with them into their chosen professions?

From very different scholars and practitioners, these papers provide a diverse array of perspectives across many spectrums focused on participatory design and community engagement. In general, we heard from very experienced practitioners to instructors approaching the subject for the first time with their students. The authors offer a wide-angle lens into some of the many types of participatory design and community engagement practices, such as urban design, community design, participatory design, social impact, and public interest design. The authors also make a clear call for the need to focus on and further develop the soft skills (e.g., empathy and communication) of students just as explicitly as the hard skills (e.g., drawing and building).

Specific to the content of the papers, Michael Carriere and David Schalliol’s “Engagement as Theory: Architecture, Planning, and Placemaking in the Twenty-First-Century City” offers an expanded model of placemaking integrating community design theory and methodology. Awilda Rodríguez Carrión’s “Hidden Ground: Native American Intercultural

Relations” demonstrates how participatory design equipped students to better understand the cultural values of the Pawnee Nation.

A couple of papers provide the perspective of community-engaged work as professional practice. Shannon Criss and Nils Gore’s “Igniting Community through Engaged Teaching” provides a view of a community-engaged practice led by the professors through their Dotte Agency, which integrates their practice with academic teaching. Jodi Dubyoski’s “Putting Participation into Practice: Strategies for Evolving Architecture” serves as a self-reflective piece speaking to what she has been able to create and sustain in professional practice through her organization, FORM Coalition. The paper offers a glimpse into how a student can be influenced by community-engaged pedagogy, shaping their future approach as a practitioner.

Benjamin Peterson and R. Kyle Warren offer a curious take on teaching pro-active problem solving in their “Contested Territories: Evaluating the Limits and Liberties of Design (and Designers) in Public Space.” They speak to teaching students to dig deeper into the understanding of contested territories by immersing themselves into data. They believe that students should learn to solve problems they self-define as opposed to waiting for someone to come to them with a problem to solve. Such thinking is typically regarded as being in opposition to participatory design and community engagement work. Also, set in a university context, Shawn Michael Schaefer’s “Community Engagement and Service-Learning Reciprocity” speaks to the work of a university-based urban design outreach studio using a reciprocal community engagement and service-learning model.

Reflecting the tumultuous time within which the conference and proceedings were organized (pandemic and protests), Trudy Watt offers us a lone view into social justice design in her paper, “Oblique Pedagogical Strategies: Improv and Speculative Realism in Support of Social Justice Design Education.”

This session brought scholars and practitioners together to continue moving the goals and methods of participatory design and community engagement into conventional practice, through future practitioners, so that buildings and landscapes are not viewed as just transactional products (physical) but, more importantly, as manifestations of impactful outcomes (sociocultural). Despite the many challenges of balancing service outcomes with learning objectives, community-engaged pedagogy is effective to those ends. Perhaps if we began to teach participatory design and engagement to students in “regular” and “traditional” studios, the practice would not be perceived as so “alternative.” Most participatory design work, when labeled as such, is oriented toward underserved communities, through university-affiliated community design centers. However, participatory design itself is a neutral term, and the practice of participatory design does not need to be limited to work with underserved communities. At all scales and budgets, participatory design can be a valuable tool, one worthy of teaching all students how to better listen to, and relate to, their fellow human beings.

For such a year as we have had, it was heartening to find that participatory design, actually engaging users and the public, was a common thread among presenters in the other three sessions as well. The timing of the conference and subsequent proceedings clearly provided some shifts in perception. Scholars proposed and presented in March, pre-pandemic, but papers were being written during the pandemic as well as connections kept through the Renegades’ “Summer School” virtual panel sessions organized post-conference. Perhaps, in the future, we will hear more about the impact of the pandemic and protests

both on and in pedagogy in the still very relevant and timely practice of participatory design and community engagement.

Note: You may view a selection of "Participatory Design and Community Engagement" paper presentations online here: <https://youtu.be/GPyYuGNVXxY>

Proceedings Papers

- p. 180** "Engagement as Theory: Architecture, Planning, and Placemaking in the Twenty-First Century City" (Michael Carriere, Milwaukee School of Engineering, and David Schalliol, St. Olaf College)
- p. 195** "The Hidden Ground: Native American Intercultural Relations" (Awilda Rodriguez Carrion, Oklahoma State University)
- p. 204** "Igniting Community Through Engaged Teaching" (Shannon Criss and Nils Gore, University of Kansas)
- p. 216** "Putting Participation into Practice: Strategies for Evolving Architecture" (Jodi Dubyoski, FORM Coalition)
- p. 231** "Contested Territories: Evaluating the Limits and Liberties of Design (and Designers) in Public Space" (Benjamin Peterson, Boston Architectural College, and Kyle Warren, Boston Architectural College & Bridge Over Troubled Waters)
- p. 245** "Community Engagement and Service-Learning Reciprocity" (Shawn Shaefer, University of Oklahoma)
- p. 258** "Oblique Pedagogical Strategies: Improve and Speculative Realism in Support of Social Justice Design Education" (Trudy Watt, University of Wisconsin–Milwaukee)

Not all authors submitted papers for inclusion in the conference proceedings; below are additional papers accepted into this session.

"EDIT [Engage, Design, Implement, Transform]: Lessons Learned During Ten Years of Participatory Design and Community Engagement" (Milagros Zingoni, Arizona State University)

"Design with People: Adapting Interdisciplinary Surrogate Models of Participatory Design" (Matthew Kleinman, University of Kansas)

ENGAGEMENT AS THEORY: ARCHITECTURE, PLANNING, AND PLACEMAKING IN THE TWENTY-FIRST-CENTURY CITY

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ABSTRACT

Our recent book, *The City Creative: The Rise of Urban Placemaking in Contemporary America* (University of Chicago Press, 2021), details how participatory design and community engagement can lead to democratically planned, inclusive urban communities. After visiting more than two hundred projects in more than forty cities, we have come to understand that planning, policy, and architectural design should be oriented by local communities and deep engagement with intervention sites. Of course, we are not the first to reach such a conclusion. In many ways, our work builds off contributions made by individuals, including Jane Jacobs, Kevin Lynch, and Christopher Alexander, and such movements as Team 10 and the advocacy architecture movement of the 1960s. Nevertheless, we need to broaden this significant conversation.

Importantly, our classroom work has allowed us to better understand how histories often left out of such discussions can inform this new approach. To that end, we have developed community-student partnerships in underserved neighborhoods in cities like Milwaukee and Detroit. Through these connections and their related design-build projects, we have seen how the civil rights movement, immigration narratives, hip-hop culture, and alternative redevelopment histories, such as in urban agriculture, can inform the theory and practice of design. We want to bring these perspectives into dialogue with the mainstream approach to development and design.

How does this look and work? Using a case study from the Milwaukee School of Engineering (MSOE) University Scholars Honors Program curriculum, we highlight the redevelopment of Milwaukee's Fondy Park, an effort to create community-centered spaces and programming in an underserved African American community. Lessons include those essential for pedagogy and education, as well as for how these issues are theorized and professionally practiced, with implications for institutions, programs, and individuals.

Keywords: Creative Placemaking, Design-Build Projects, History, Inequality, Pedagogy, Urban Agriculture

1. INTRODUCTION AND THEORETICAL MOTIVATION

The projects and approach we discuss in this paper are motivated by the rise of creative placemaking as an economic redevelopment strategy across the United States. Attempting

to woo the “Creative Class”—or the educated, affluent workers of the knowledge-based, postindustrial economy—these efforts employ arts and culture to attract newcomers to urban cities, often at the expense of current residents. In these instances, gentrification can quickly lead to the displacement of both people and culture. In *The City Creative: The Rise of Urban Placemaking in Contemporary America* (Carriere and Schalliol 2021), we respond to this dynamic through two contributions: first, we provide a thorough account of the conceptual development of creative placemaking as an urban redevelopment strategy in the United States, one that leads to the inequalities briefly noted above. Second, we propose an alternative approach to creative placemaking anchored in community-driven projects that build social connections while producing and redistributing resources. We arrived at these intentions through a decade-long study of do-it-yourself (DIY) attempts to address local social problems in more than forty US cities through archival research, documentary photography, interviews, participant observation, and site visits. Below, we provide an overview of these points to describe the motivations for our pedagogical approach to undergraduate-based design-build projects, such as those employed in Fondy Park in Milwaukee, Wisconsin.

First, a key definition: The mainstream understanding of creative placemaking may be summarized by the definition advanced by Markusen and Gadwa in their 2010 report for the National Endowment for the Arts (NEA):

Creative placemaking animates public and private spaces, rejuvenates structures and streetscapes, improves local business viability and public safety, and brings diverse people together to celebrate, inspire, and be inspired. In turn, these creative locales foster entrepreneurs and cultural industries that generate jobs and income. (Markusen and Gadwa 2010, 3)

There is, of course, a history behind this concept. A closer look at the bibliographies of reports authored by scholars like Markusen and Gadwa find multiple citations of works by the likes of Jane Jacobs, William H. Whyte, Kevin Lynch, Richard Florida, and professionals associated with the New Urbanist movement, among others. And organizations that fund place-based arts work, including the NEA and ArtPlace America—the latter a collection of foundations, financial institutions, and federal agencies that supported placemaking projects from 2011 to 2020—have also used this intellectual trajectory to inform their funding decisions.

Yet it is our contention that this mainstream approach to placemaking misses much. Most broadly, this practice privileges a newly arrived “Creative Class” at the expense of populations who have called these cities home for generations. Mainstream creative placemaking thus overlooks the histories of such populations, while concentrating resources in predominantly white downtown corridors and away from neighborhoods of color that desperately need such investment. At the same time, the focus of such placemaking work tends to be on passive consumption; for example, one does little more than enjoy most murals, and their presence often marks an area as safe for the “Creative Class.” With *The City Creative*, we sought projects that challenged this understanding of placemaking by highlighting a commitment to certain types of production (of actual things like manufactured goods and fresh food). This emphasis on production initiates real conversations on the redistribution of certain resources, from jobs to land itself. Drawing from a broad mix of theorists and histories, we came to see that such projects draw from essential architecture

and design practices that should be central in discussions of the future of architecture and related pedagogy.

Such an examination of this alternative approach to creative placemaking calls for a reorientation. To create this new framework we worked to revisit—and, in some cases, resuscitate—individuals, organizations, and movements often overlooked in both broad accounts of American architecture and urban planning and in more specific histories of mainstream creative placemaking. On the one hand, this has meant a closer, more critical reading of the likes of Jane Jacobs. But it has also led us to take a closer look at movements like Team 10, historic preservation, advocacy architecture, and the radical roots of postmodernism. Additionally, it has oriented us toward the relationship between the built environment and DIY subcultures, as well as urban redevelopment projects that use production to redistribute resources in an effort to heal the economic, social, and environmental damage wrought by earlier attempts to renew the city.

So what does this look like? What can one take from such disparate sources to craft a more inclusive definition of placemaking? We can begin a counterhistory with the humane brand of modernism practiced by the Team 10 movement. The Dutch architect and Team 10 member Aldo van Eyck highlighted the group's intention: "Whatever space and time mean, place and occasion mean more." Architecture should therefore be conceived as creating a "Built Homecoming" based on the human needs of its inhabitants, starting with shelter. This focus on the people within "the built artifact" led van Eyck to conclude that he "defined space simply as the appreciation of it, thus excluding all frozen properties attributed to it academically whilst including what should never be excluded: man appreciating it!" (Smithson 1968, 41).

Such an appreciation of the human element convinced the group of the need to reevaluate some of the crucial tenets of architectural modernism. Convinced that the one-size-fits-all model of design robbed individuals of their creativity and freedom of expression, van Eyck argued for a brand of architecture that didn't overlook the tastes of the people it was trying to accommodate. This led van Eyck to reconsider the role of vernacular architecture and the role of ornamentation in design. He asked: "In what way are people to participate in fashioning their own immediate surroundings within a conceived overall framework? You see, when one says 'city' one implies the 'people' in it, not just 'population'" (ibid., 31).

Such a philosophy toward architecture also led van Eyck to become highly critical of modernist urban planning. In planners' race to tear down the old and put up the new, they neglected "all sense of place." Even more, these individuals, fearful of "the unpremeditated event, the spontaneous act . . . made a flat surface of everything so that no microbes can survive the civic vacuum cleaner." The modern attention to cleanliness and order had literally bled the city of its life's blood (ibid., 44).

By the mid-1960s, American architects were developing similar lines of thought. At Columbia University, James Marston Fitch argued for an architecture that had to "proceed from the bottom up" and drop the belief in "absolute and universal" standards. Fitch urged his fellow architects and planners to pay attention to the particular over the general and accept differences and a form of aesthetic pluralism. Most importantly, Fitch argued for a smaller-scale, more humanistic understanding of architecture and urban planning that takes seriously the experiences and tastes of the city dweller, whatever her background. While modernist models of urban plans were often made based on "decisions affecting 68 in. people made from an altitude of 3500 ft!" Fitch firmly believed that the profession had to

take on the street-level perspective of the pedestrian. This, Fitch concluded, was how an authentic version of architecture and planning could emerge that acknowledged the importance of history, context, and experience while fostering community (1965, 4, 5).

Such ideas informed Fitch's decision to found Columbia University's historic preservation program in 1965. For Fitch, the "idea of such a program . . . represented my own dismay at the widening environmental disasters of the post-World War II years—especially as the real consequences of the urban renewal programs became apparent." At the same time, Fitch was also influenced by his friendship with Jane Jacobs, whose *Death and Life of Great American Cities* (1961) allowed Fitch "to look at cities as living organisms, not inert tissue which architects and planners could manipulate at will, each according to his own private standards of good design" (Fitch 1981, 235). Based on such influences and sentiments, Fitch was motivated by the environment of the 1960s and the desire to save aspects of the urban that people still used and appreciated.

In the same year Fitch established Columbia's historic preservation department, the urban planner Paul Davidoff published his essential essay "Advocacy and Pluralism in Planning." For Davidoff, who would come to be seen as the founder of advocacy planning, "The prospect for future planning is that of a practice which openly invites political and social values to be examined and debated." In the pursuit of true "urban democracy," planners would have to drop their fanatic devotion to concepts of expertise and objectivity. "*Appropriate planning action cannot be prescribed from a position of value neutrality,*" Davidoff strongly asserted, and a planner should in fact "be an advocate for what he deems proper" (1965, 331, 332).

As Davidoff argued in a 1967 piece for *Perspecta* magazine, such an approach would bring real democracy to a process too often carried out in "relative isolation," removed from any connection to pressing social, political, economic, or cultural concerns. As Davidoff concluded, "Planning should be made a plural process, a process in which a number of competing plans are presented to the public" (1967, 158).

Such a quotation is indicative of Davidoff's understanding of advocacy planning. First and foremost, one sees Davidoff's commitment to a plurality of plans made available to the citizens affected by development. Yet more importantly, Davidoff sees citizens as playing an active role in the formulation of these plans. Finally, there remains a role for the trained professional. They are there to provide necessary support for the community, to help them navigate through—and negotiate with—the planning process itself. Such a model would come to influence many young architecture and planning students.

Some of those influenced by the likes of Davidoff would become early practitioners of postmodern architecture. Yet counter to the brand of postmodernism that came to dominate the practice during the 1980s, early advocates for this approach, including Charles Jencks, believed that "Post-Modernism" called for an architecture of inclusion, one that found great value in "extending the language of architecture in many different ways—into the vernacular, towards tradition and the commercial slang of the street." Importantly, Jencks also stressed the "active, valuative aspect" of city life. At the same time, postmodern planners took aim at the secretive nature of modern urban planning and proposed to make planning decisions within a "democratic, political context where his values can be made explicit and debated." All of this would set the stage for the "return to an old and never perfect institution, the public realm." Here was a true place where people could live, gather, and "assert their communality" (Jencks 1977, 108).

In the late 1970s, people were already asserting their communality in DIY urban cultures. In the South Bronx, the hip-hop pioneer DJ Kool Herc turned an underutilized rec room at 1520 Sedgwick Avenue into a makeshift club. When those early hip-hop concerts attracted too many people, Herc and others appropriated nearby Cedar Playground (Chang 2005). Throughout the United States, the rise of punk rock illustrated how DIY culture could transform urban buildings. Punk rock venues like ABC No Rio (founded in New York City in 1980), 924 Gilman (Berkeley, CA, 1986), and Trumbullplex (Detroit, MI, 1993) all transformed previously vacant structures into epicenters of artistic creation.

Yet what was produced in such spaces looked and sounded little like the arts being produced in mainstream placemaking endeavors. These are the roots of an alternative understanding of production. Another set of such origins can be seen in the literal roots of agriculturally based projects. Such projects occurred during World War I, the Great Depression, and World War II, but a more inclusive version rises following the deindustrialization and economic upheaval of the 1970s. In Milwaukee, one sees the arc of this federally funded but locally administered Shoots 'n' Roots urban agriculture program in the 1970s and 1980s, which provided garden development support for African American families who arrived during the Great Migration. In the 1990s, partly inspired by the program, the urban farming pioneer Will Allen began his legendary Growing Power urban farm near the city's largest public housing project to provide healthy food, a connection with the environment, and community support. In the 2000s, Sharon and Larry Adams built on Allen's work by organizing their neighbors to establish Walnut Way Conservation Corp., an urban agriculture-centered community development group focused on their racially and economically segregated neighborhood. In each, urban farming was positioned as one piece of an inclusive brand of placemaking that stressed equitable development and environmentalism focused on neighborhoods of color, those often most damaged by industrial expansion and collapse. Importantly, Walnut Way has been able to purchase the land on which they farm, interrupting the process of gentrification by keeping property ownership within the community while simultaneously providing space for residents to make money through the production of healthy food.

1.1 AN EMERGING NATIONWIDE NETWORK

While *The City Creative* tracks the work of activists from all professions, two contemporary examples may help demonstrate the direct connection between architecture and redistributive and productive placemaking. In Chicago, the Sweet Water Foundation, led by the trained architect Emmanuel Pratt, has transformed the site of a demolished Chicago public school in the city's African American Washington Park neighborhood. The once-derelict site is now a city-block-sized garden and community center that provides urban agriculture education, job training, and low-cost food to neighborhood residents. The visual centerpiece of the site is the Thought Barn, a timber-frame building constructed through a barn-raising ceremony during the 2017 Chicago Architecture Biennial, which has become the site's visual signature and the heart of its public work (Figure 1). Elsewhere in the city, the architect and designer Iker Gil's MAS Studio has partnered with groups like Architecture for Humanity and artists like Luftwerk to create community-driven installations in underserved neighborhoods. Among the guiding principles of this work is attention to low-cost and flexible designs, especially in the production of much-requested street furniture on the site of derelict lots in such places as the Mexican American Little Village neighborhood (Figure 2).

Other high-profile examples of the link between architecture and this more expansive model of creative placemaking include Project Row Houses in Houston, which uses housing destined to be demolished as the centerpiece of gallery and living spaces (Figure 3), and the Society for the Advancement of Construction Related Arts in Buffalo, New York, a novel job training program that teaches traditional skilled trades through artistic design-build projects (Figure 4). In each case, special attention to the built environment and its relationship with host community outcomes are hallmarks of the projects.

2 CONNECTING RESEARCH AND PEDAGOGY

This work has informed our pedagogy. At its most basic, we have connected students—and the public—with such organizations through visiting lectures and museum exhibitions that feature their work. We have led trips of Milwaukee School of Engineering (MSOE) students to Detroit to meet with organizers like the Green Garage, a socially and environmentally focused incubator and small business space. And we have taken St. Olaf College students to Milwaukee to visit with leaders of organizations like Walnut Way. Such classroom and site visits are motivated by the idea that students should be directly exposed to a broad range of organizational models and experiences before engaging in the student projects we discuss below.

2.1 COLLABORATIVE STUDENT PROJECTS IN MILWAUKEE, WISCONSIN

Organizations like Walnut Way are indicative of a vibrant activist community on Milwaukee's African American North Side, with a particular interest and history in urban agriculture. This history goes back over forty years, but over the past decade, activists such as Will Allen, Venice Williams (Alice's Garden), and Andre Lee Ellis (We Got This) have created expansive farms in areas of the city marked by deindustrialization, depopulation, and housing loss (Figure 5). These projects are physically rebuilding derelict spaces and, in the process, repopulating communities, connecting neighbors, and producing tangible products. As they have matured, they have also become job training programs, facilitating small business development in ancillary fields such as food preparation.

Within our respective academic institutions, we have developed community-student design-build project partnerships in underserved North Side neighborhoods that are guided by these histories. Such work has allowed us to better understand how histories often left out of discussions on creative placemaking can inform a new approach to the practice. This has led MSOE students to collaborate with the architect Susan Sloan on the design and construction of a mobile farm stand to facilitate the development of a new farmers' market in the city's Harambee neighborhood. At the under-resourced Browning Elementary School on the city's North Side, another group of MSOE students transformed a vacant greenhouse into an aquaponics laboratory to produce fish and produce for students and community members alike. Outside of the greenhouse, students installed a solar food dehydrator to create healthy snacks. These projects have also been integrated into the school's curriculum in the natural and social sciences.

2.2 FONDY PARK CASE STUDY

These success stories allowed us to think bigger, as is evident in the Fondy Park project. Fondy Park is located in the North Side Milwaukee neighborhood of Lindsay Heights, one of the country's most racially and economically segregated communities, where divestment

has taken its toll on community members and the built environment. In addition to lost jobs and opportunities, pervasive derelict lots and abandoned structures create literal holes in the landscape. In 2016, one such lot adjacent to the park offered the opportunity to create a neighborhood-centered multiuse space through a community-municipal government partnership.

Working in tandem with Walnut Way, MSOE students facilitated listening sessions with Lindsay Heights residents to determine what community members wanted in their new neighborhood park. Broadly speaking, residents desired a safe space that highlighted such themes as environmental resiliency, food security, and local culture. More specifically, they stressed the need for comfortable seating, tables that featured chess boards, and a stage for outdoor performances. After making and presenting initial renderings of potential designs, MSOE students collaborated with the architect Ray Chi and carpenters Matthew Grambling and Timothy Linn to build the structures; construction was completed in September 2017 (Figure 6). To emphasize the importance of community guidance, neighborhood residents' words were carved into tables throughout the park (Figure 7).

The chess boards have proven immensely popular with neighborhood residents, as has the park's open green space: community groups now hold weekly yoga classes at Fondy Park throughout the summer. Moreover, local organizations such as Walnut Way hold their annual Harvest Day Festival in the park, and MSOE has offered student-run STEM workshops there. It is also a place where residents can simply sit, relax, and even surf the internet. A free wi-fi network was installed in the park in 2018.

As noted in community listening sessions, Lindsay Heights residents were concerned with environmental resiliency. This was not simply an ideological stance; it was a practical issue. Flooding is a significant problem in the neighborhood, particularly for the area's older housing stock. To address such concerns, Fondy Park included sustainability features to decrease the strain on the city's sewerage system. Here, such partners as the City of Milwaukee's Environmental Collaboration Office, the nonprofit organization Reflo Sustainable Water Solutions (whose executive director, Justin Hegarty, is an MSOE alumnus), and for-profit engineering firm GZA GeoEnvironmental Inc. collaborated on a rainwater catchment system that includes a 2,500-square-foot bioswale that temporarily holds water in a prairie-like area. This water then drains into a cistern that holds up to 71,000 gallons of water. Fondy Park even features a series of "street cuts," which guide water from nearby city streets into the park. Finally, the park is decorated with native perennial plantings, which absorb rainwater during storms (and are nourished by the cistern's water). All these design tools remove significant strain from the city's sewerage system, reducing flooding in the neighborhood. All these green infrastructure components are maintained by Blue Skies Landscaping, a firm run by Walnut Way that hires residents, particularly those affected by incarceration.

Yet Fondy Park's innovations help more than nearby residents. When the City of Milwaukee's sewerage system reaches its maximum capacity, it is forced to dump raw sewage into nearby Lake Michigan. Any diversion helps protect the entire region against such events, challenging the belief that environmental sustainability is more likely in white, affluent neighborhoods. In fact, after the park became solar powered in 2019, the City of Milwaukee named Lindsay Heights the first "Eco-Neighborhood," a designation meant to encourage tourism. A neighborhood previously dismissed as marginalized is now on the cutting edge of sustainability, combining environmental improvements, opportunities for social interaction, employment opportunities, and access to outside dollars.

This does not mean the project was without obstacles; issues related to representation (as seen in the voices chosen to be represented on the chess boards) and distribution of opportunity (as seen in who was awarded contracts to build the park's structures) led to heated discussions throughout the development process. Within such discussions, the presence of Walnut Way—a well-respected neighborhood-based organization—proved invaluable. By taking on a mediator role, Walnut Way created the space, both intellectual and physical, where students participated in the development of a successful park. Through collaborative visioning with residents, they learned alternative histories of architecture and urban planning, systems for local engagement in which community members actually lead, and collaborative design practices that bridge residents and tradespeople; they also developed technical skills through structural and landscape architectural work. For such students, these projects become a way to act as budding engineers and planners through hands-on, experiential learning; they are therefore an important training tool. Yet they also teach these young people the lesson that context matters and that community members are essential to successful projects. Moreover, the model is vital for MSOE itself, as it enhances its community connections while contributing solutions to the city's long-standing racial and economic problems.

3. CONCLUSION

As the case study of Fondy Park demonstrates, we are building a model that combines our approach to productive, redistributive creative placemaking that can also be a model for how academic institutions can be partners in such development while providing important learning opportunities. We see this approach as central to architecture and design pedagogy, even for students outside of architecture, design, and urban planning. Such a desire for a fresh approach has led us to (re)consider actors often left out of discussions on architecture, planning, and placemaking. This has allowed us to see the real value of community participation in such projects. Those who have called these neighborhoods home for generations have a profound understanding of what these communities lack. But, more importantly, they also understand the strengths and assets of the neighborhood, which are often overlooked in outsider accounts of these communities. It then becomes the task of the student, professor, and other professionals (including architects, urban planners, and engineers) to draw from such strengths and assets as a reciprocal relationship is formed between community and professionals.

Of course, our approach is anything but exhaustive; many ideas, potential partners, and spaces are still to be explored. In Carriere's Milwaukee, for example, are there ways to integrate the culture of the growing Hmong population into placemaking efforts? And in Schalliol's Minneapolis, how could such placemaking work begin to speak to the experiences of the Somali population? We are excited to contribute to this evolution of placemaking.

FIGURES



Figure 1: Sweet Water Foundation, Chicago, Illinois (Photograph by David Schalliol)



Figure 2: Assembly of MAS Studio's Cut. Join. Play. in Little Village, Chicago
(Photograph by David Schalliol)



Figure 3: Project Row Houses, Houston, Texas (Photograph by David Schalliol)



Figure 4: A Society for the Advancement of Construction-Related Arts project, Buffalo, New York (Photograph by David Schalliol)



Figure 5: Alice's Garden, Milwaukee, Wisconsin (Photograph by David Schalliol)



Figure 6: Fondy Park, before (looking southwest) and after (looking northeast), Milwaukee, Wisconsin (Photographs by Tim McCollow)



Figure 7: Fondy Park table with community member quote, Milwaukee, Wisconsin
(Photograph by Nicolas Lampert)

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THE HIDDEN GROUND: NATIVE AMERICAN INTERCULTURAL RELATIONS

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ABSTRACT

Over the last two decades, a trend has been developing in the design community to promote social equity and emphasize the ethical responsibility of design. Community participation, programming, and post-occupancy evaluations have cemented a more democratic design process in which users, clients, and community members are given a voice to affect the final architecture product through a process called participatory design. This *modus operandi* becomes more vital when dealing with subcultures that historically have felt marginalized from the dominant culture. In the United States, there is great diversity among Native Americans, but our mainstream culture tends to see them as a homogeneous group, focusing on their commonalities rather than discovering and understanding individual tribal values. With the blind acceptance of generalizations about any subculture, we may miss the critical details that shape the opportunity to showcase their uniqueness and celebrate their differences.

Within the studio context, what learning modalities are best to implement a participatory and constructivist learning experience? Traditionally, studio teaching with project-based design focuses on students learning formal considerations of design such as theory, environmental/structural performance, and implementation of regulatory measures. The participatory design methodology (PDM) differs in its approach by focusing on a process that emerges from all players. It does not dictate design but creates an environment that allows it to emerge through the process and interactions. The PDM process prioritizes collective synergy and creativity using participation techniques to allow for alternative solutions.

In response to an inquiry by the Pawnee Native American Tribe, which invited us to investigate a proper approach to conduct design propositions within their land, this paper will report the lessons learned from the process and will exhibit alternate ways of implementing design ideas, using methodologies that expand the boundaries of academia while reaching out to native communities.

Keywords: Design, Native Americans, Participatory, Pedagogy

INTRODUCTION

Teamwork is the critical organizational format that designers can use to address the complexity and challenges that architecture projects inherently contain. The strength of any

team is their ability to collaborate effectively. In the fourth-year architectural studio at Oklahoma State University (OSU), a required student learning outcome is that students must demonstrate evidence of understanding the implications that arise when designing for a diverse cultural and social context, in addition to learning how to effectively collaborate within multidisciplinary teams and interact with different stakeholders within the project context. This paper narrates the experience of teaching a course that introduced the concept of participatory design aimed at exploring how to reframe the hierarchy and power between clients, students, and faculty. The empirical data on which this paper is based were collected through the practice of teaching.

1. CRAFTING THE STUDIO

Teaching a design studio is always a creative endeavor. The challenge to give students a multicultural experience without traveling abroad is always a predicament. Furthermore, students must recognize that any design they conceive is as much about the people involved in conceiving and developing their social construct, environment, and culture as their own creative talents. The question of design ownership and the ability of any design to integrate the local inconspicuous dimensions that make up any particular culture is a valuable lesson, especially within the current contemporary design culture of students and young designers infatuated with influential and incessant image culture that follows international design trends. Modus vivendi and local culture have the unique power to inform the lifestyle, sensibilities, and values of a project that seeks to represent it. In addition, it is essential to understand the particulars of local how-to culture, as it has a significant impact on the desired level of craftsmanship and construction typology that could be achieved.

In the fall of 2019, the author coordinated a design studio that sought to collaborate on a cross-cultural adventure with a local Native American tribe in response to an inquiry by the Pawnee Native American Tribe to investigate a proper approach for conducting design propositions within their land. In this process, the design studio partnered with two community organizations, the Association of Tribal Archives, Libraries, and Museums (ATALM) and the Museum of the Pawnee Nation Advisory Board, to design a cultural center for the Pawnee Tribe on a site located in Pawnee, Oklahoma.

2. OPPORTUNITY TO WORK WITH THE COMMUNITY

In 2018, ATALM conducted a survey across the US Native American nations and tribal communities that revealed that only 195 tribes out of 474 Indian nations had a cultural center or a museum. Many of the tribal artifacts are housed in large national institutions such as the Smithsonian's National Museum of the American Indian. For the Pawnee tribe, it is the Field Museum in Chicago that conserves an extensive collection of artifacts. The survey revived the strong sentiment among Native Americans that tribal cultural heritage artifacts should belong in the hands of the tribal community and should not be separated from their original tribe. ATALM received special funds from the National Leadership Grant, Institute of Museum and Library Services, to start a yearlong program to help Native communities plan their cultural facilities. The program is called "Culture Builds Community." A core value among Native Americans is sovereignty and self-governance. To sustain Indigenous culture and its legacy, it is vital that they regain authority over their cultural patrimony. However,

many of these tribes lack the resources to build viable facilities, or if they have an existing facility, it may not meet the standard criteria to house or exhibit many of these artifacts.

Native Americans have had a tumultuous history within the United States. It began with the premise that European settlers would impose new conceptions of power, sovereignty, and social control (Szeman and Kaposy 2010, 2). Because of the settlers' social Darwinism and discriminatory attitudes, the Native Americans were disenfranchised and marginalized, and in the words of Marianne O. Nielsen and Linda Robyn (2003, 33), "marginalization is a direct result of colonialism." European settlers, believing themselves to be a superior civilization and race, considered the Native Americans to be ignorant and irrational. Therefore, white settlers sought to acculturate them and forced them into boarding schools to provide them with a "formal education" and then stripped them of their land, language, and culture (Nielsen and Robyn 2003, 36–37). When working with a subculture that has historically felt marginalized and has cultivated throughout generations a sense of distrust for the host and mainstream culture, the organizational structure of the collaboration needs to acknowledge and be empathetic to their perception of power and be sensitive to these issues.

The Pawnee tribe has a history that spans more than seven hundred years. They originated from the plains along the North Platt River in Nebraska. In 1875, they were removed from Nebraska and replanted to what we know today as Pawnee County in northern Oklahoma. After taking their ancestral sacred land at the beginning of 1887, the federal government forced the Native Americans' cultural assimilation by mandatory attendance at Indian boarding schools in their attempt to "civilize" the "savages" (Reyhner and Oyawin Eder 2004, 37). Today, the Pawnee tribe is 3,200 members strong, and many of them reside in the vicinity of Pawnee, Oklahoma, as well as across the United States. A point of pride in their society is that they have been supporting American freedom efforts through many wars. The Pawnee warrior traditions have allowed them to distinguish themselves in many of the US Armed Forces but especially in the US Army (Pawnee Nation 2012).

3. VALUE OF THE PARTICIPATORY DESIGN METHOD

Once the university-community partnership got started, we felt that the traditional architecture studio organization would not be the best vehicle to explore the design process of such a project. Our students' design approach is in line with the thinking that they design "for" the client rather than "with" the client. The distinction between "for" and "with" is an essential one for the students to learn, particularly at this time in their careers. Once understood, they can become better designers and shift the hierarchy of power and sense of ownership of the design to the people who will inhabit it. The participatory design method (PDM) facilitated this shift in perception over the dominion of the final design, since the "with" was established from the beginning and reinforced throughout collaborative interactions. During my eleven years in academia, I have observed the "for the client" mode in students' design approaches. In fact, they constantly assumed full ownership of their designs, referring to them as "my design" and not necessarily a design that serves a client or one that arose from desk critiques. Additionally, many times students resist making necessary changes to their designs because they do not understand the (fictitious) client's position inscribed in the program within the collaborative faculty-student environment.

Michel de Certeau examines in *The Practice of Everyday Life* the distinction between Design Participation and Participation Design in the way people operate within these two frameworks. Typically, designers need to create an exchange space using one of these two

frameworks, either consciously or unconsciously, as they practice design. According to de Certeau, the first one deals with strategies, and strategies are methods of a dominant institution or entity with power. At the other end, tactics are the actions of those involved without autonomy or power (de Certeau 2011, 34), and we experience an analogous situation in academic scenarios (faculty vs. students). In contrast, PDM differs in its approach by focusing on a *modus operandi* that emerges in a horizontally oriented hierarchy, one that considers all the users or “players” involved. The PDM builds ownership of the outcome, acknowledges the value of self-reliance by boosting the confidence of its participants to get involved in the decision-making, and reduces the risk of the users having unrealistic expectations for the building use and performance. In our case, faculty, students, the Pawnee Tribe, and all legitimate stakeholders were involved in the decision-making process from the beginning. The PDM seemed like an appropriate approach. The faculty, a selected group of students, the Pawnee Tribe, and its different subgroups, such as the tribe elders, veterans group, women's group, were all involved in the PDM decision-making process. The students' PDM subgroup explored opportunities in how to engage the client and evaluated different modalities that ranged from active to passive, informal to formal. In the end, students favored the more casual and social interactions, along with formal online surveys, face-to-face interviews, and cultural activities like tribal dances.

Giving people a voice and creating an environment where ideas can easily float to the surface, be evaluated, and synthesized toward a shared vision was the primary design process. Therefore, our results could only be as good as the decision and the development process. Having a horizontal hierarchy and sharing power was not always an easy landscape to navigate. A structured system needed to be established. Those having more in-depth or extensive knowledge on a specific topic, acquired by experience or proven research, were allowed to create the reviewing criteria or “unspoken” rule of respect toward that knowledge base but still allow all participants, including those with maybe a naïve or plainly divergent view on the topic, to participate in the discussions and decision-making process.

Not all decisions were made in a participatory manner. Depending on how these decisions or choices affected the players, and taking into account the limitations of working within an academic calendar, the studio faculty felt the need to define the level and depth of participation. It can be argued that it may not have been a “true” participatory model, but working within an academic environment and this being my first time implementing PDM in the studio brought its challenges. In the end, the students still benefited from being exposed to this type of exercise even with the limitations.

When committed to using a PDM, it is imperative to establish democratic values, equality, and empathy toward all the participants involved. It is important to find common ground and mutually learn from one another (Kohls and Knight 1994). In working with the Pawnees, students needed to understand their societal values and the critical cultural influence that shapes them. The students did preliminary research to inform themselves of these early in the process. However, when it came to direct interactions with the tribe, it was difficult for them to navigate aspects of the cultural differences. Some of the tribe's traditional values challenged some students' intercultural sensitivity. For example, the Pawnee perception of time is not linear but more relative, relative to the “right time.” Furthermore, the tribe's relationship with the environment and nature seeks to align with the natural flow, so time is associated with those flows.

The close web of social relationships that the tribe establishes with colleagues and others not related to members of the tribe, who are seen as extended family, confused some

students. For the Pawnees, there is a clear awareness that community needs come before “self” needs. Another example of cultural differences occurred when the tribe clashed with the architectural studio culture of critique or criticism. Criticizing, even if it was in a constructive way, was burdensome for some of the tribal members. Another main cultural difference related to topics of spiritual life and sacred objects, which the tribe was very secretive about despite the students’ need to know more about them to inform the design better. It was challenging for students to witness that their inquisitiveness would go unanswered, as they needed clarity in the specifications for exhibiting artifacts and storing them properly. This issue made the students fully aware of their own cultural conditioning. The issue struck a chord with a few students who showed frustration at the tribe’s perceived lack of trust. We realized that we did not have the right mechanisms to navigate these divides.

The PDM has four phases throughout the design process, which are connect, understand, create, and deliver:

—“Connecting,” the first step in the process, involves building a relationship with the community, stakeholders, neighbors, grassroots leaders, local vendors, and others. We needed to identify the right people and the opportunities they could offer for the success of the design. Setting up this initial step was also a critical step toward designing “with” people.

—During the “understand” phase, we proceeded to unearth and explore the knowledge about the local context, such as the place, people, and resources available. Throughout this process, the community’s needs, resources, and assets were examined, and opportunities identified. Having the right tools and asking the right and sometimes the misguided questions throughout this phase were important to constructing the right scenarios and delivering tailored design solutions.

—Once the needs and wants were identified, students began the “create” phase by breaking down the design process into smaller pieces while identifying ways for the community to be involved as active participants of the iterative design process. This phase was quite challenging because of the time needed so that ideas and viable solutions could be discussed while allowing for open feedback loops for their refinement. How the community was approached in this phase directly contributed to the outcomes. At the heart of the PDM, creativity and engagement are key to gaining a sense of communal ownership for the design solution. Implementing the design solutions and developing activities to sustain interest in the project as well as capacities to care for and maintain the project over its long-term life were, however, outside our academic realm.

—Lastly, within the academic environment, we found out that the “delivery” phase presented many challenges; undergraduate students’ schedules are at full capacity; many students work outside the studio environment to supplement their income. The first and last phases needed lots of fieldwork and time that were difficult to fit into students’ schedules outside the studio time. In our specific environment, students in the fourth-year undergraduate studio need to expand their technical skills as well as their interpersonal skills. An essential soft skill to develop in the design process is “how to relate and collaborate with people from all walks of life.” While conducting PDM research, besides participating in many outside classroom engagements, much time was needed to process and analyze the knowledge and in-

sights so that they could be implemented in the design. One student's comment and observation was, "Many times I design solutions from the information given by the program but rarely on research from the 'ground' or the people's perspective and context. After this experience of designing 'with' the people involved, I will seriously consider the implications that my design has in a much wider spectrum."

4. WHAT TOOLS COULD HELP US UNCOVER CULTURAL VALUES?

When talking about culture, just like an iceberg, some things can easily be observed on the surface, such as different music, language, food, and so on. More important, though, is to discover the things that are hidden underneath this iceberg, less visible but deeply rooted and ingrained in the cultural values. These values are vital because they unconsciously control behaviors. We felt that we needed to have the right tools to uncover these hidden cultural perspectives and values. While doing research, the author discovered a cross-cultural exercise developed by Paula Chu called the Culture Compass, which was adapted to be used not only to uncover the tribe values but students' values and biases so that common ground(s) could be found (Seelye 1996, 22). There are critical issues within the cross-cultural collaboration that need to be uncovered and grasped, the most basic of which is the concept of individualism, which is the way that the individual relates to others. According to Geert Hofstede's cultural dimensions theory, which is a standard framework used for cross-cultural communication, the United States highly values the individual within its society, in contrast to the Pawnees, whose ideologies fall under the notion of collectivism, where the interests and claims of the people as a group overrule those of the individuals (Hofstede Centre 2018). The concept of Hofstede's cultural dimensions is a framework to classify and explain the influence of culture on their particular object of study (Hofstede 1994, 258). It is structured from the analysis of five specific dimensions each culture possesses that portray their communal behavior. Hofstede's original cultural dimensions were power distance, small/large; collectivism vs. individualism; femininity vs. masculinity; uncertainty avoidance, weak/strong; long-term orientation vs. short-term orientation (1994, 240), but later he added a sixth dimension, indulgence vs. restraint, in the third edition of *Cultures and Organizations* that he co-authored with Gert Jan Hofstede and Michael Minkov in 2010 (see also The Hofstede Centre n.d., "National Culture"). Knowing how the participants value these dimensions helps understand one another's positions.

Power Distance

The first of these considerations is the power distance, which explains the extent to which a community accepts and endorses authoritative power differences and the status of privilege. How comfortable is the individual at challenging authority when there is a perceived injustice?

First, we looked at the classroom and then at the interactions with the tribe and community. In a traditional academic environment, professors are seen as experts who impact students' knowledge. However, in this case, faculty came into the process having the same base knowledge about the history and culture of the Pawnee Tribe. We saw our role as facilitators and arbitrators who helped establish a positive cross-cultural rapport with the tribe. Therefore, new knowledge acquired through the exploration of academic readings and personal interactions (interviews, surveys, and participation in cultural events) with the tribe was examined and validated with group consensus as our collective findings surfaced.

Collectivism vs. Individualism

The PDM framework embraces the iterative design process that involves creative action with critical analysis and then consensus. One important aspect is for all the participants to become aware of the “self” while participating but to engage in a collaborative way on the collective action. Deconstruction of traditional academic hierarchical pedagogy forms of distributing knowledge was necessary to support the PDM creative process.

Femininity vs. Masculinity

Gender relations do have a major influence on cross-cultural affairs. According to the Plains Anthropological Society journal, the Pawnee Tribe was a matriarchal society, but in our interactions, we observed that both genders had equally active roles with different perspectives, which many times facilitated our understanding of the building needs and the specifics of the use of space.

Uncertainty Avoidance

The art of making and creating needs time and curiosity to explore. When working within practical or professional work scenarios, there are elements of unpredictability; not everything can be anticipated or planned for. This is when flexibility and resilience are needed to manage the unforeseen setbacks. Students struggled with these issues. Unlike academic projects, “real-world” projects often require changes to correct their course of direction in the unexplored “uncharted waters.” PDM takes more time and resources, as it follows a nonlinear path. Therefore, as new findings and decisions emerged through the participation and interactions, initial designs were challenged and continually reframed to accommodate new information. PDM does not dictate a specific design process or course of action, but it prioritizes an environment that allows for uncertainty to surface. This feeling of uncertainty frustrated some students who had been conditioned to have access from the beginning to quantitative and qualitative data to explore their design ideas.

The Pawnee Tribe sees themselves as a collective and in harmony with the universe. They position themselves as part of a broader ecosystem, starting with the belief that their ancestors are stars in heaven. Their concept of time is more in flow with the rhythms of life, so they are more inclined to live in the moment and not be bound by the artificial time restraints that Anglo-Saxon culture runs on.

Students’ decision-making process started by defining the problem and the tribe needs. To achieve this task, the class was asked to self-organize into smaller groups that would investigate a preselected list of case studies of Native American cultural centers across the nation. They were asked to investigate the main formal and spatial elements that characterize the buildings, create analytic diagrams, and make an educated guess regarding the impact of these findings on the design through the exploration of photos, plans, drawings, and Google Earth or other map materials. The idea behind these “Special Reports” was to start comparing their findings across the studio to recognize if there were emerging patterns or themes that are common among Native Americans that could be written into the prototype design guidelines. Making the formal entry be from the east as a connection to the Morning Star and symbolic of new beginnings, for instance, emerged as a crucial organizing element in many of the case studies. Parallel to this exercise, they were asked to read a list of papers and books that dealt with the history and contemporary issues specifically about

Native American art and the Pawnee Tribe. All students had direct access to all the stakeholders during this process.

Long-Term Orientation vs. Short-Term Orientation

Time orientation is different across the world. Working on PDM and dealing with a different conception of time frames could create a challenging environment. Aside from our previous observations of tribal notions of time, real-life problems do not follow an academic semester. Managing and coordinating with different organizations, community partners, faculty, and students within a PDM framework created an extra workload that needed to be considered, as well as the need to embrace a more serendipitous time frame.

The author further subcategorized the long vs. short orientation to a “being vs. doing” dimension. How a culture fits within their natural and socially constructed environment reflects their attitude toward the being or doing dimension. The philosophy or aspiration to “conquer” their environment by changing its nature expresses the doing dimension, while wanting to “flow” with its rhythms embodies the being dimension. This is at the root of the resulting physical environment morphology. Around the world, millennia-old Indigenous groups have exhibited a thriving symbiosis with nature. Their knowledge of local context informs their ingenuity and resourcefulness. The Pawnees have a strong connection to the land and a reverence for Mother Earth and her natural flows. Students who understood the difference between these two and operated with the “flow” took on the challenge of understanding the traditional roots of the tribe to come up with innovative solutions that combined traditional knowledge with modern designs. To Native Americans, the circle has been an important symbol that represents the sun, the moon, seasons, and life-to-death cycles. Many students attempted to translate the meaning and symbolism that the tribe attributes to sacred geometry such as the circle by proposing contemporary adaptations.

Indulgence vs. Restraint

The last cultural dimension deals with the way society encourages the pursuit of pleasure or indulgence. What is considered particularly shameful or selfish? Several reasons, including the lack of time, prevented us from investigating this cultural dimension, so we will not address it here.

CONCLUSIONS

The PDM turned out to be the proper pedagogic method for students to become more actively engaged in defining their own learning experience and more present throughout the design process. The selected PDM group produced consistently critical knowledge that the group at large benefited from. Moreover, students quickly incorporated the knowledge they helped uncover. These same students demonstrated a willingness to participate in the extracurricular activities offered sporadically throughout their interactions with the Pawnee Tribe, such as honor dances and other cultural activities. The PDM opened up more activities for students to learn from beyond the typical classroom setting and structure by engaging and challenging students with different levels of participatory activities and in role-changing scenarios where they were responsible for the dissemination of reliable information in a sort of collaborative teaching. The faculty role shifted at points to support and facilitate those interactions. The PDM was a valuable platform to help uncover the

critical details that influenced the design and allowed the designers to showcase their uniqueness within this subculture by celebrating their differences.

In my recent experience with PDM, we learned to take our students' points of view into consideration and to transform the traditional academic hierarchy by adopting, in many instances, a more even distribution of power. Students are motivated when they are involved in the course design and development, as well as in the interplay of seeing themselves as true project collaborators. The divergent backgrounds of all the participants brought a richness and depth to the discussions that contributed to a successful outcome. In contrast to the one-sided academic approach, our tactics needed to keep a level of fluidity to accommodate the dynamics raised by the different stakeholders involved and the need to adapt to developing situations, which were ever changing. In retrospect, it would have been worthwhile to dedicate an entire academic year to the experiment rather than the time dictated by stringent (and perhaps outdated) academic calendars.

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IGNITING COMMUNITY THROUGH ENGAGED TEACHING

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ABSTRACT

Much of what we consider to be traditional teaching practices has been formed within the limits of a classroom setting, buried within a disciplinary focus. Yet our students face great societal, economic, and environmental challenges. We must ask what are we educating our students for? Do traditional models prepare our undergraduate and graduate students for a dynamic and changing world? Service-learning gets students involved in thinking in the context of real-world issues about how to address pressing community needs in partnership with community organizations. In this paper, community-engaged teaching and service-learning will be illuminated by highlighting four diverse pedagogical approaches. This paper will provide new considerations for how to integrate or advance service-learning through courses: (1) learn by designing and making; (2) learn by cross-disciplinary engagement; (3) learn by engaging in other fields and cultures; and (4) learn by serving in the pipeline.

Keywords: Community Engagement, Design-Build, Service-Learning

1. SOCIETAL, EDUCATIONAL, AND DISCIPLINARY CONTEXT

In the early 1990s, as we were emerging as practicing, licensed architects and starting graduate school, Ernest L. Boyer, through the Carnegie Foundation for the Advancement of Teaching, issued two reports recommending significant changes in higher education: *Scholarship Reconsidered: Priorities of the Professoriate*, a call to rethink higher education in general; and a separate one for architectural education in particular, *Building Community: A New Future for Architecture Education and Practice*. A key message in both was that “the work of the scholar also means stepping back from one’s investigation, looking for connections, building bridges between theory and practice, and communicating one’s knowledge effectively to students” (Boyer 2014, 16). Boyer emphasized making meaningful connections between theory and practice to the students’ benefit, but also the value of providing service, whereby “schools . . . help increase the storehouse of new knowledge to build spaces that enrich communities, prepare architects to communicate more effectively the value of their knowledge and their craft to society, and practice their profession at all times with the highest ethical standards” (Boyer and Mitgang 1996, 28). In the intervening years, we have had ample opportunity to practice some of what Boyer recommended through community-engaged scholarship and service-learning projects, working with

partners in a variety of community settings and for different ends. This paper examines lessons learned during that time and places them in the context of a rapidly changing society and a changing architecture discipline. We will discuss four factors that influence the ways we teach architecture, attempting to address Boyer's call to change the way we train a new generation of architects: (1) radical societal challenges in recent history; (2) virtual learning; (3) shifting ways of practicing architecture; and (4) pedagogical shifts in how we define an architectural education, and share some of the projects that we have completed in our way of working.

1.1 SOCIETAL CHALLENGES

Climate change, economic insecurity and inequality, economic globalization and local disinvestment, increasing world population, fossil fuel and natural resource depletion, and spiraling educational costs make our world today a very different social, political, and economic environment to be educating students in. Just as we were delivering this paper at the "Schools of Thought" conference, the coronavirus pandemic was breaking loose; and now as we are finalizing this paper, the reemergence of widespread protests against police brutality and systemic racism are at the forefront. What does it mean to educate architecture students in this context?

1.2 VIRTUAL LEARNING

Higher education can be delivered in many forms outside of the traditional campus environment. Content delivery via the internet has expanded learning opportunities for many people who might not otherwise be able to access education. From single courses to entire degree programs, virtual learning can deliver learning materials in an enriched manner through audio and video, synchronously and asynchronously, at a time responsive to students' circumstances. Though many in the academy had not tried to expand their arsenal to include virtual learning, most were forced to at some level—and continue to—during the coronavirus campus shutdown. These learning experiences, coupled with rich experiential learning opportunities, offer expanded ways of teaching and learning for students' benefit.

1.3 DISCIPLINARY SHIFTS

The practice of architecture has changed significantly since we entered this profession. Digital computation for design and building information modeling, the emergence of new business models and building delivery systems, digital fabrication and manufacturing, and evolving economic pressures have complicated our work, both as architects and as educators. When we were in school in the early 1980s, it was probably sufficient for us to be trained as a typical architect, who would be presumed to be working on buildings in a "design/bid/build" model of building delivery. Today that's probably not sufficient. In 2010, following the collapse of the financial system, Martti Kalliala and Hans Park described the "shrinking polar ice cap of traditional practice," and visualized a new landscape of occupations that architects would be involved in, outside of traditional, building-based architectural practice. "The fragmentation of the building process into the hands of

specialist consultants, and the shift from architects being in the service of public to private capital, has made a lot of the work and responsibilities that traditionally belonged to them simply disappear or move to other professional domains. This is why newly graduated architects have difficulties finding jobs that match their education, creative ability or ambition—not to mention the thousands of students facing an increasingly uncertain future” (Kalliala and Park 2010; Figure 1).



Figure 1: Image from Kalliala and Park, “New Architect’s Atlas”
<http://helsinki.designlab.org/blog/new-architects-atlas.html> CC BY-SA 3.0 license)

1.4 PEDAGOGICAL SHIFTS

Again, when we were in school, our studio education consisted of hand drawing images on paper and building cardboard models. We never touched a real material in the context of our education, and we never engaged with anyone outside the academy. The studio briefs were highly fictional and theoretical and, we believe, not atypical for most architecture schools at that time. Today, we find a very different architectural education landscape. Most schools have some kind of hands-on component in their curriculum, along with community engagement, internships, study abroad, and a variety of studio activities to provide for an enhanced educational experience (Erdman et al. 2002).

2 COMMUNITY-ENGAGED SCHOLARSHIP

2.1A NEW UNIVERSITY MODEL

At the university there is constant pressure to increase the number of students while doing this with fewer resources—often the quick fix seems that virtual learning is the answer. Is there a tipping point where higher education without engagement is hollow? Engaged place-based learning, designing and building in collaborative ways, and building relationships in general are some of the greatest values of a place-based institution and fulfill the civic-minded education we need most to guide young architects and designers forward to address society’s most pressing needs.

2.2 DISPLACE THE CENTER TO MEET PEOPLE WHERE THEY ARE

To fulfill this goal, we must be prepared to meet people where they are—the community member, the underserved, those who would value the voice that design thinking offers. They aren't going to travel to your campus to find you in your office or campus-centered space. Instead, we have to be prepared to meet community members in the public realm at, for example, community events, in church basements, or by creating opportunities to engage in public parks to meet people where they are—often we are required to find translators to effectively communicate. The University of Kansas (KU) is located in Lawrence, Kansas, and forty minutes by car from downtown Kansas City, Kansas (KCK) in Wyandotte County. To meet our engagement goals, Professors Shannon Criss and Nils Gore and Matt Kleinmann (PhD student) formed Dotte Agency, a multidisciplinary collaborative that engages neighborhoods to shape the built environment to improve public health.

2.3 DOTTE AGENCY: CREATING SPATIAL AGENCY IN WYANDOTTE COUNTY

We have defined the area with which we work through public health data that define Wyandotte County as home to one of the most racially diverse populations in the country. However, according to the Robert Wood Johnson Foundation's "County Health Rankings," Wyandotte County also ranks last among counties in both health behaviors and for social economic factors of health ("County Health Rankings 2012"). The backstory on that goes deep, to the 1930s Federal Home Owners' Loan Corporation home refinancing patterns where neighborhoods were "redlined" for home investment and ranked from "A" ("desirable") to "D" ("hazardous"; Figure 2). Dotte Agency has focused its efforts on the underserved, disinvested (mostly minority and low-income population) neighborhoods where home loans were difficult or impossible to obtain and still impact community lives today—we see the impacts on public health through data and visible signs of a distressed built environment.

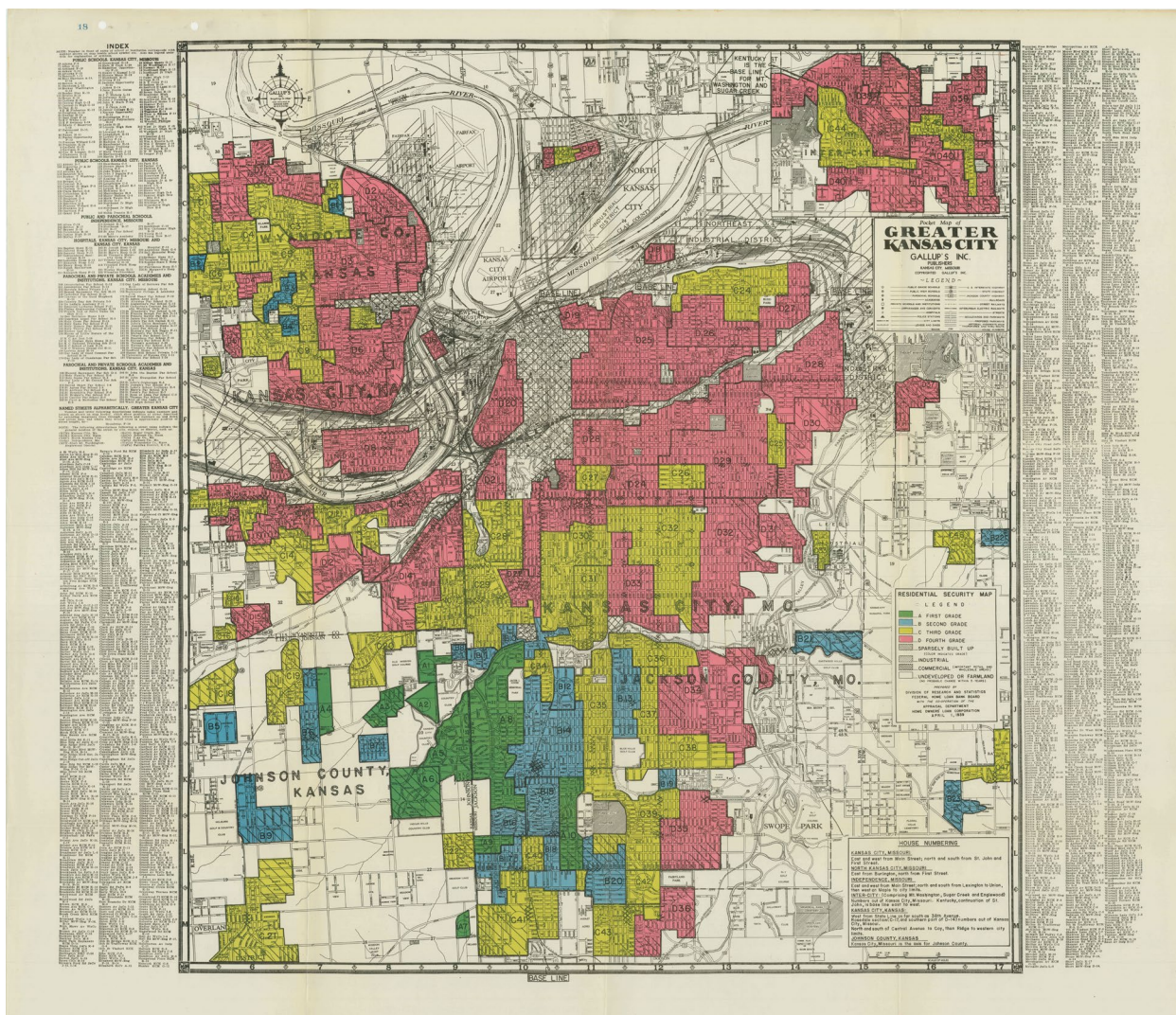


Figure 2: Kansas City redlining map
(Mapping Inequality Project, University of Richmond CC BY-NC-SA 4.0)

2.4 IDENTIFYING NEW WAYS OF WORKING

We have not operated as a standard practice in academia or the profession—but instead have opted for a way of working in the community that is through the knowledge and experience of others. We have learned to rely on our health equity experts—residents, neighborhood leadership, foundation investors, and professional and public health experts. By aligning with others' frameworks, we are better able to be useful and part of a larger conversation. We have aligned the work of Dotte Agency around supporting environments and policies that promote equitable opportunities for healthy eating, active living, and healthy public life. If we as a discipline choose to genuinely listen, we can learn a lot and be better designers. The Health Forward Foundation in Kansas City has created a *Healthy Communities Theory of Change* document that provides guiding principles, strategies, and guides to achieve short- and long-term outcomes when working with communities. Three core strategies: (1) equitable engagement, (2) mobilization for action, and (3) multisector collaboration have guided our Dotte Agency work. We have found that by “engaging community members in the conversation and [finding] solutions for developing healthier

communities, environments and policies,” we are keeping their interests and needs at the center of the conversation (Health Forward Foundation 2019). We have also received external support in an effort to mobilize community, individuals, and groups to catalyze and accelerate others’ interests. And, finally, we have engaged with nontraditional partners across multiple fields and sectors to assist in creating a stronger, unified voice, which has effectively changed and expanded our abilities to be better-informed and able designers.

To effectively do this work, we work hard to build trusting relationships within the community. By being there, a community partner offered us the use of an empty storefront over the course of three years, where we could have an expanded classroom (community members as fellow students and faculty) and offer it as a place for community partners to use, create public events, and raise awareness of how design can facilitate and activate community voice. In turning design into an active agent to make ideas visible and serve to create prototypes that play out others’ ideas, we believe we provide spatial agency where we are helping community residents and leadership see their spaces in new ways and helping us see their challenges and possibilities through their eyes. We are citizen experts who bring skills, knowledge, and capacity to a given problem, and the community serves as the expert citizens who direct the work through deep knowledge embedded in place and history. When we involve students in this approach, it offers them new ways of understanding their role and has the potential to change the trajectory of the profession as they take these practices forward—ultimately becoming new citizen-architects.

2.5 THINKING WRONG

In a typical design setting, the role of designers is to communicate their decisions regarding the shape and function of any given proposal. Designers tend to be limited, however, by their preconceived notions of what tools and strategies they need to employ for any given design challenges. To overcome these basic assumptions, the graphic designer and educator John Bielenberg asks his students “to get a new definition of the problem, not simply a new range of possible solutions” (Zolli 2005, 106). When designers use their training to re-contextualize systems of public health, they can propose alternative definitions of the problem for which new and potentially more effective solutions may become more readily apparent. By giving design proposals tangible form, the model can elicit feedback at an earlier stage of development, thus allowing for a greater potential solution as the designers respond to the criticism. When utilized in communities, this process has the potential to invite nonprofessional residents to give richer feedback, not based on empirical evidence, but rather on their tacit knowledge as members of their community’s culture and context.

3.0 FOUR NEW CONSIDERATIONS OF HOW TO INTEGRATE AND ADVANCE SERVICE-LEARNING THROUGH COURSES

To effectively do this work, we have developed four modes of advancing service-learning through coursework. This approach to teaching and scholarship is difficult. The trust building requires a lot of (essential) work, but so does setting up specific opportunities to incorporate students—who are inexperienced with listening and sensitively working—into the work through collecting information and building design responses collaboratively, within limited means and within tight (semester-by-semester) time frames. On top of that, as faculty, it is not enough to teach; we must also seek external funding, develop the community network to successfully pull off community-based projects, and then find ways to gain external review to

legitimize this work in an academic way that institutionally favors individual achievement (achieving promotion and tenure for this work is evolving in universities)—none of which is easy. However, we have identified four basic ways to work: (1) learn by designing and making; (2) learn by cross-disciplinary engagement; (3) learn by engaging in other fields and cultures; (4) learn by serving in the pipeline.



Figure 3: Mayor Mark Holland cutting the ribbon on exercise station prototypes designed and constructed in a third-year design studio course (Dotte Agency)

3.1 LEARN BY DESIGNING AND MAKING

Design thinking begins with empathy with a deep human (and nonhuman) focus so that insight can be gained, revealing new and unexplored ways of seeing and understanding. To design requires reframing the perceived problem or challenge at hand and *listening* to others' perspectives. This approach allows a more holistic look at the path toward the "solution." Collaboration and multidisciplinary teamwork can leverage the skills, personalities, and ways of thinking of *many* to solve multifaceted problems. Engaging in early exploration of selected ideas and rapidly prototyping solutions encourages learning by doing. This allows multiple voices and perspectives to gain additional insight into the viability of solutions before too much time or money has been spent. This feedback process tests the prototypes and identifies those further to remove any potential issues. Through iteration, empathetic frames of mind assist in redefining the challenge as new knowledge and insight are gained along the way. While it starts off chaotic, it can steamroll toward points of clarity until a desirable, feasible, and viable solution emerges.¹

Inherent in the design school format is the relatively limited time students have to digest the problem, explore initial concepts, and then begin fabrication toward a final design solution. Rather than take on larger-scale projects, Dotte Agency instead encourages students to think in terms of "small bets," whereby they can reasonably meet the objectives they and the community set for themselves at the beginning of the design process. This approach allows the students to propose alternative solutions to otherwise invisible problems. For example, the Centers for Disease Control and Prevention was prohibiting the use of funds for Dotte Agency to build a park bench, as it was considered sedentary behavior, despite community engagement indicating that infrequent walkers needed

adequate sitting to take breaks in the park. The students then reimagined their design as a hybrid bike rack and fitness station, allowing it to move toward reality (Figure 3).

3.2 LEARN BY CROSS-DISCIPLINARY ENGAGEMENT

In 2011, the Healthy Communities Wyandotte (HCW) coalition was launched by adopting a theory of collective action. HCW began convening multidisciplinary stakeholders into action teams focused on key health issues. Through the 1422 Grant from the Centers for Disease Control and Prevention, and in partnerships with the Community Health Council of Wyandotte County, Dotte Agency supports the placement and promotion of greater access to health in the built environment in an effort to reduce the risk of type-2 diabetes for Wyandotte County residents. By working with interdisciplinary partners, Dotte Agency utilizes design as a tool to improve access to fresh food in food deserts and increase safe and walkable places to be physically active.

Over the last six years, Dotte Agency has begun to bring resources to these issues by connecting students from the KU School of Architecture and Design (ArcD) with students and faculty from the KU School of Medicine, Department of Preventive Medicine and Public Health, as well as students and faculty in the KU School of Business and KU Department of Applied Behavioral Sciences. The courses we've developed are typically available to students on an ad hoc basis, relating the changing needs of our community partners for specific resources to take on original projects.

In 2017, Dotte Agency received external funding from the Association of Schools and Programs of Public Health (ASPPH) to support a cross-disciplinary collaboration between ArcD and public health departments by developing two professional courses taught simultaneously. The courses were designed to facilitate a shared understanding of the interplay of design and health as it relates to neighborhood food access, walkability, and active living. Through an approach that centered on both didactic and experiential learning, students learned about one another's respective disciplines as they relate to the built environment and health and completed an applied project that included neighborhood assessments and interaction with community members. The culminating experience was a community exhibition in which students presented to the represented communities a summary of their findings and attainable design solutions for improving food access and walkability. This course project has opened up all sorts of conversations with academics, other public health agencies, and community leaders that have expanded our capacity to teach students in a variety of ways (Figure 4).

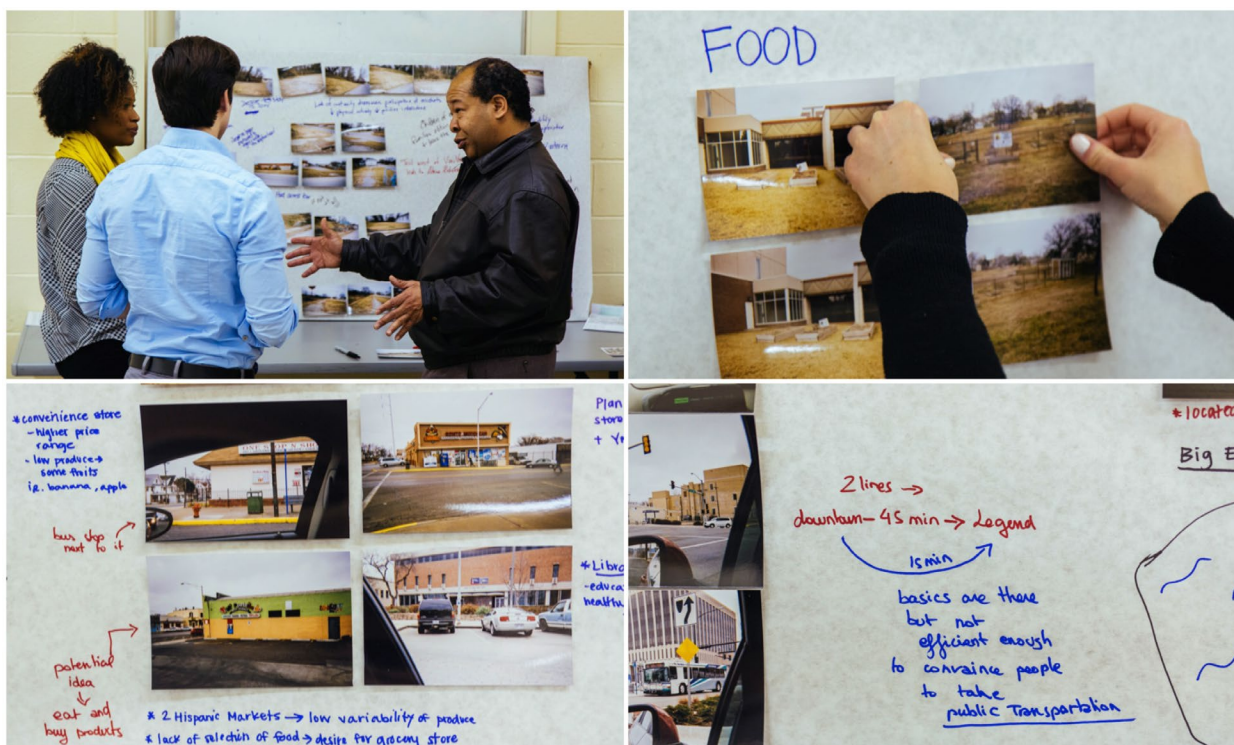


Figure 4: Photovoice project exploring food access issues in a cross-disciplinary course of KU architecture students and KU public health students (Dotte Agency)

3.3 LEARN BY ENGAGING IN OTHER FIELDS AND CULTURES

In 2019, partnering organizations Cultivate Kansas City (KC) and Catholic Charities of Northeast Kansas approached Dotte Agency seeking assistance with design advice on how to best develop a newly acquired fifty-acre parcel for urban agriculture programs in Kansas City, Kansas. “Cultivate KC is a locally grown nonprofit working to grow food, farms and community in support of a sustainable and healthy local food system for all.”² They work to create a democratic, just food system that is resilient, adaptable, and able to provide equitable access to healthy food. Their partnership with Catholic Charities of Northeast Kansas has made it possible for Cultivate KC to expand their mission to train refugees with agricultural experience to become independent farmers.

With very limited funding but social capital available from our partners, current refugee farmers, local practicing architects and landscape architects, extension agents, and others invested in the local food policy network, Dotte Agency was able to create a course that (1) educated students about the economic and social development of urban agriculture and exposed them to case study examples of food-distribution practices and best practices on how to support local food-insecure community members—learning that the best practices are inclusive ones that engage a variety of “expert” partners; (2) created a two-day immersive workshop that included urban agriculture tours, discussions with community partners, and three groups teaming with multidisciplinary partners for a “design charrette”; and (3) taught students how to collect their research, workshop design results, and conclusive discussions into a shared document. This document was then made available through our community partners and others to promote insight gained through this

experience and serve as a product to advocate and gain support for the real development of this project.

Through this experience, students gained the capabilities to learn how to use their abilities to research different models of urban agriculture and enable them to be better listeners and apply their knowledge directly to a design experience. In preparation for the design charrette, we developed a toolkit that included a scaled physical model, program template parts, and other elements (like a board game) to make all participants designers, ready to bring their expertise to the conversation. The students were able to support the effort by listening, restating, and taking notes, ultimately bringing the ideas together in a presentation to all that participated. By engaging with others, they were able to test and apply learned design skills in another way—enabling design agency for others (Figure 5).



Figure 5: Sharing a bike-based farm utility vehicle prototype with potential users in the New Roots for Refugees program in Kansas City. The bike was developed in a seminar with KU architecture students and KU industrial design students. (Dotte Agency)

3.4 LEARN BY SERVING IN THE PIPELINE

With the city as our classroom, our students are exposed to a broad cross-section of people: young and old, racially diverse, differently abled. We learn from one another and gain insights into the experience of people often unlike ourselves. With recurring experiences in

place, we can start to imagine a pipeline of people and activities that grows over time. Some of the young people in our communities may be exposed to the act and discipline of design for the first time. Through mentoring, the university students may be able to help younger students see the possibilities and promises of design to affect their daily lives, as well as the historical, political, and social factors that have made communities the way they are. In the most optimistic case, a student who starts young as a community member participating in a project might end up going to architecture school, then participating as a college student in mentoring younger citizens, then after graduating becoming a mentoring professional to both college students and younger community members. By consciously constructing the pipeline, and encouraging repeat participation in it, a culture of understanding and re-creation can be forged in the service of true systemic change.

4. CONCLUSIONS AND FUTURE WORK

In the years that we have been doing community-engaged work, we have learned the following:

1. There is a fluid, sustainable link between teaching and scholarship, as envisioned by Boyer when he said, “Theory surely leads to practice. But practice also leads to theory. And teaching, at its best, shapes both research and practice. Viewed from this perspective, a more comprehensive, more dynamic understanding of scholarship can be considered, one in which the rigid categories of teaching, research, and service are broadened and more flexibly defined. . . . The work of the scholar also means stepping back from one’s investigation, looking for connections, building bridges between theory and practice, and communicating one’s knowledge effectively to students” (Boyer 2014, 16).
2. The most meaningful and successful work, by most any standard, is integrated and informed by community engagement and citizen insight (citizen-experts).
3. Beyond the ostensible disciplinary lessons learned, perhaps more valuable are the soft skills that students need to acquire to address local/global challenges. In discussions with students long after the semester is complete, it’s clear that there are even more fundamental lessons learned about the nature of citizenship and the larger responsibilities we have as citizens in our communities. Tangible lessons in leadership, collaboration, ability to communicate, empathy/understanding/awareness are lessons not easily learned in the absence of clinical field experience.
4. The work capitalizes on the strengths of a place-based university, with bodies experientially engaged in the world. But we are also able to use virtual learning to connect with one another, our community partners, and partners elsewhere in the world for an expanded reach to connect and incorporate diverse insights.

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 Community Housing of Wyandotte County

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 Health Forward Foundation
 Historic Northeast Midtown Association
 Latino Health for All Coalition
 Menorah Heritage Foundation
 New Bethel Church Community Development Corporation
 20/20/20 Movement
 Unified Government of Wyandotte County Parks and Recreation Department
 Unified Government of Wyandotte County Health Department
 Wyandotte Health Foundation
 YouthBuild Kansas City, Kansas

KU School of Architecture and Design
 KU School of Medicine Preventive Medicine and Public Health
 KU Department of Applied Behavioral Sciences Work Group
 KU School of Architecture and Design (over 300) Students

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¹ [Interaction Design Foundation](#).

² <https://www.cultivatekc.org/our-work/about-us/>.

PUTTING PARTICIPATION INTO PRACTICE: STRATEGIES FOR EVOLVING ARCHITECTURE

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ABSTRACT

For decades, schools of architecture have included hands-on education in their curricula in the form of design-build studios; often these studio experiences are guided by a social mission and employ participatory methods. In other cases, university community design centers provide opportunities for students to engage with community members on real-world projects. My own academic experience (which was far from unusual) involved the former, beginning with a summer studio focused on asset-based community development and participatory engagement framed within a design-build experience that launched me on a career-long path.

Being confronted with a profession that conducts business as usual while academia is grooming a generation of socially responsible architects is jarring for new graduates. Today's professionals approaching mid-career are unsatisfied with outdated business models that do not address contemporary concerns about social impact. Barriers to participatory engagement in practice include hourly billing that discourages clients from commissioning non-mandatory stakeholder engagement, as well as a culture of pro-bono work that ultimately accelerates burnout and devalues professional services. New ways of thinking require new ways of doing business.

Today's practitioners are seeking more sustainable methods of integrating the participatory strategies they employed in academia into contemporary practice. Drawing on extensive research conducted on the history of community design during my Master of Architecture, and using illustrations from my own path—from a student during the post-Katrina era to owning a community design practice—I propose strategies for challenging current models of practice. Specifically, I demonstrate how my current work with private landowners and nonprofit economic development groups incorporates participatory methods learned during my academic experience, borrowing from an interdisciplinary range of sources, including anthropology, sociology, and planning, as well as others who are disrupting the status quo of delivering creative services.

Keywords: Capacity Building, Community Design, FORM Coalition, Participatory Design, Pedagogy, Pro Bono

1. INTRODUCTION

Fifteen years ago in August, Hurricane Katrina hit the Gulf Coast. At the time, I was just beginning my second year of architecture school at Virginia Tech. I didn't realize it then, but this single event had a defining impact on the trajectory of my career. Future spring breaks were punctuated with design-build trips to help with the relief effort. In subsequent seminar classes and studio projects, we closely examined the role of architecture in society. During a summer studio intensive with Design Corps (Figure 1), I was introduced to the ideas of asset-based community development, generational poverty, and environmental activism—seen through the lens of architecture. As a thesis student, I cofounded a student chapter of Architecture for Humanity and helped my friends construct a modular affordable housing prototype (Figure 2). These immersive experiences shaped my approach to my newly chosen profession and set me on a lifelong path.



Figure 1: (L) Asheville Bus Shelter, 2006 (Design Corps)

Figure 2: (R) Modular Habitat House, Virginia Tech, 2009 (Jodi Dubyoski)

2. COMMUNITY DESIGN, PARTICIPATORY PLANNING, AND SOCIALLY ENGAGED PEDAGOGY

For decades before I entered architecture school in the early 2000s, architectural education had been preparing students to engage with real-world issues through hands-on learning. The earliest seeds of modern education, sown in the pedagogy of the Bauhaus, carried with them the idea that architecture can and should shape society. Hannes Meyer, who led the Bauhaus from 1928 to 1930, posited that the ultimate aim of Bauhaus work was the “harmonious arrangement of our society,” an idea that was a reflection of the modernist movement as a whole (Saval 2019).

In the hands of the modernists, however, architecture remained a tool of power and privilege, as it had been for centuries. It was through the civil rights movement of the 1960s that the social imperative in architecture gained new relevance and momentum. Though community design centers had already begun to organize in the early 1960s, the origin of the community design movement is commonly traced to a single keynote speech given by Whitney M. Young in 1968. While the mythology of this moment is overinflated in community

design lore, it was effectively a call to racial justice in the built environment that catalyzed the subsequent community design movement.

In the following decades, through widespread adoption of participatory design methods, architects and planners challenged the existing paradigms of who had power and a voice in shaping the built environment. Henry Sanoff traces this growth in his essay “Multiple Views of Participatory Design,” while demonstrating that the idea of participation in design and planning remained fundamentally aimed at a redistribution of power in city making (Sanoff 2011). At its core is the idea of the “right to the city,” first proposed by Henri Lefebvre, and expanded on by thinkers like David Harvey, who says:

The right to the city is far more than the individual liberty to access urban resources: it is a right to change ourselves by changing the city. It is, moreover, a common rather than an individual right since this transformation inevitably depends upon the exercise of a collective power to reshape the processes of urbanization. (Harvey 2008)

Giancarlo De Carlo, an architect and educator of the era and another champion of participatory design, says simply, “Architecture is too important to be left to architects” (De Carlo 2007, 13).

Early examples of community design principles in academia include the Black Workshop at Yale, founded by Black students in 1968 to engage in community-driven urban design. Around the same time, we begin to see the emergence of design-build studios, a hands-on, immersive learning experience that often centered issues of poverty or homelessness. One of the first modern design-build studios was also at Yale, but others soon followed, the most well known of which is the Rural Studio, founded by Sam Mockbee and Daniel K. (D.K.) Ruth in rural Alabama in 1993. Today, more than 70 percent of US architecture schools have in-house design-build programs (Gjertson 2014). Throughout the latter half of the twentieth century, the concurrent rise of the community design movement, participatory planning, and design-build education laid the groundwork for what we now call social impact design.

By the time my peers and I entered college at the dawn of the twenty-first century, social responsibility and personal impact were deeply embedded in the culture of architectural education. Thus, when Hurricane Katrina made landfall in 2005, the stage was set for the academy and practice to converge in a very public way. Brad Pitt’s Make It Right Foundation and the global humanitarian agency Architecture for Humanity made headlines for their relief efforts, and this sudden visibility propelled community-engaged design into the public consciousness. For students of architecture at the time, the possibility of social impact through a career in architecture was being modeled for us before our eyes (Walker 2016).

To what are we to attribute the endurance of this trend in architectural education? Some of its continued relevance may be, as Margaret Crawford (1991) suggests, rooted in an identity crisis birthed in the professionalization of the discipline, whereby social responsibility as a professional ethic became a means of distinguishing ourselves from the other building trades. Contextually, social entrepreneurship on the whole has been on the rise since the latter half of the twentieth century. In their 2013 Latrobe Prize study, “Wisdom from the Field: Public Interest Architecture in Practice,” Roberta M. Feldman and her coauthors report that 30 percent of the respondents they surveyed “gave ‘putting creative abilities to practical use,’ and ‘improving quality of life in communities’ as their first and second reasons [for entering the profession]” (Feldman et al. 2013, 3). Surveying the wide variety of educational experiences available, three common characteristics emerge to explain the gravitational pull of incorporating social impact in design education: opportunities for hands-on, experiential learning; the feeling of personal agency or individual impact; and the chance to address systemic and structural inequalities through the design of the built environment—or “make the world a better place.”

In 2009, I was a newly minted architecture graduate with an impact design education facing the worst job market we’d seen in decades. So, I took the first sensible opportunity that came along and signed up to ride my bike across the country to raise money for affordable housing. In my team of twenty-five young adults, three of us unemployed architecture school grads, we stopped along the way to volunteer with Habitat for Humanity and Rebuilding Together. Following the trip, I signed on to work with one of our workforce housing partners for a natural building internship in southern Utah. Both of these practical learning experiences gave me a chance to contribute meaningfully as an individual and allowed me to work as part of a team addressing the structural inequalities of the housing industry.



Figure 3: (L) Bike & Build, 2009 (Jodi Dubyoski)

Figure 4: (R) Community Rebuilds, 2010 (Community Rebuilds)

After a couple of part-time engagements, the economy began to steady, and I landed my first full-time office job nearly two years after graduation. Finally on the path to licensure, I spent the next few years working in small and mid-sized firms, experiencing a range of project scales and team sizes and remaining engaged in community design as I could, as a volunteer.

3. BARRIERS TO PARTICIPATION IN PRACTICE: BUSINESS AS USUAL IN AN ERA OF SOCIAL IMPACT DESIGN

Being confronted with a profession that conducts business as usual while academia is grooming a generation of socially responsible architects is jarring for new graduates. Stakeholder participation is an essential process in social impact design, and yet obstacles to incorporating participation into practice are plentiful and are generally tied to issues of time and value. A common objection to participatory processes is that transparent processes generate conflict and cause unnecessary and expensive delays. Put another way, people themselves are the problem. As long as professional services are billed hourly, participation is viewed as extra, not integral, and must generally be subsidized by foundations or government entities (Davidoff 1965)—a process that contributes to even more delays and restrictions.

A secondary, related contributor is that the value a design professional brings to the process is not always clear. Educating the public on the value of architecture was one of the action steps named by Feldman and her coauthors for sustaining and expanding public interest practices (Feldman et al. 2013, 7–8). The AIA has attempted to address the public perception issue over the years, recently through the #ILookUp campaign in 2014, an arguably out-of-touch public relations effort that failed to address root causes, retaining a focus on buildings as products rather than on the ability of architects to partner in shaping processes and outcomes.

3.1 The Problem of Pro Bono

In the last decade or so, pro bono studio programs have cropped up at the country's biggest firms, evidence that the desire to incorporate community-centered work is part of a larger trend. CannonDesign's Open Hand Studio (2009), Citizen HKS (2014), and the Social Purpose Program at Perkins & Will are just a few notable examples. The creation of these programs and others like them was spurred by Public Architecture's One Percent program (now known as 1+), founded in 2003 (McKnight 2016). According to the One Percent website, member firms provide nearly \$30 million in services each year.

Number of employees	Share of firms	Share of staff	Share of billings
1 to 9	75.8%	19.4%	13.7%
10 to 49	18.0%	29.8%	30.3%
50 or more	6.3%	50.8%	56.0%

Figure 5: Share of 2018 billings by firm size (American Institute of Architects)

The idea of giving away professional services to those who can't afford them is great in theory, but as long as profit and value are tied to the number of hours worked, pro bono doesn't work. Consider \$30 million annually (the value of pro bono services donated via the 1% program) in relation to small-firm operating budgets. Seventy-five percent of architecture firms consist of nine or fewer employees. With 19% of architectural staff nationwide, these small firms command less than 14% of total annual billings (Figure 5). Large firms, on the other hand, take in 56% of billings compared to their 51% of staff. These numbers are based on 2017, when national billings totaled \$484 billion dollars (AIA 2018).

While it is an imperfect analysis, since large firms carry more overhead per person, if we look at the difference between the share of total billings in relation to the share of total staff, then large firms bring in a 5 percent higher share, or \$24.2 billion annually. The aggregated pro bono amount of \$30 million is less than 1 percent of that "surplus"—effectively a negligible amount. Assuming that a small firm needs to generate \$100,000 in revenue per employee per year (Figure 6), and that by that reasoning \$500,000 can support a five-person office, then \$30 million could reasonably support sixty five-person offices (Ramos 2017).

figure 1.4 | EVEN WITH BENEFITS TO SCALE IN THE PROFESSION, MOST ARCHITECTURE FIRMS REMAIN SMALL

Share of total firms, staff, and gross billings in the profession by firm size, 2012

Firm size (number of employees)	Share of firms	Share of staff	Share of billings	Net revenue per employee
1 employee	26%	3%	2%	\$70,000
2–4 employees	37%	12%	8%	\$74,000
5–9 employees	18%	13%	11%	\$95,000
10–19 employees	10%	15%	14%	\$113,000
20–49 employees	6%	20%	22%	\$132,000
50–99 employees	2%	15%	16%	\$136,000
100+ employees	1%	22%	27%	\$138,000
All firm average				\$86,000

Figure 6: 2012 net revenue by firm size (American Institute of Architects)

When hours spent on pro bono are hours taken from paying work, only firms large enough to absorb the lost revenue can afford to spend meaningful hours on unpaid projects. For the rest of us, in the absence of this ability to absorb additional overhead, pro bono work often means accelerated burnout or a lower quality deliverable. In addition, offering services for free does nothing to properly anchor the value of design services in the eyes of the public.

Today's rising practitioners are unsatisfied with outdated business models that do not address contemporary concerns about social impact, and we seek more sustainable methods of integrating the participatory strategies we employed in academia into twenty-first-century practice.

4. FORM COALITION: PUTTING PARTICIPATION INTO PRACTICE

In 2018, the Association for Community Design reaffirmed racial justice as the top priority for its network of community design practitioners in the United States (Association for Community Design 2018)—a call for architects to facilitate the redistribution of power in the creation of space, just as in the early days of community design. As we enter the second half of 2020, there is a renewed call for racial justice nationwide, and a new urgency to reckon with the legacy of racist policies on public space. As community design practitioners, we redistribute power to our clients through participatory processes, by making services accessible through transparent pricing, and through knowledge sharing.

As a for-profit community design practice, we try to approach participation at FORM Coalition in a couple of different ways. The first is: Who participates in the design of space? Within this framework, participation is about building processes that get stakeholders to the table and provide multiple opportunities for co-creation along the way. In practice, this means that thoughtful and inclusive community engagement is an indispensable part of our design process—not an add-on. (I’ll admit that this is often aspirational.)

The other question we ask is: Who has access to space once it’s constructed? In our position as service providers, this is much more difficult to control or influence, but reflecting on two recent trends in the profession can help reframe the question. The first is the architects-as-developer model, and while this is not something we’ve adopted at FORM Coalition, we do intentionally network with small, community-minded developers so we can pursue clients who are more likely to align with our values. The other trend we’ve been benefiting from is the uptick in marketing coaching for small-firm architects and service providers designed to help untether fees from time. As we refine our implementation of value-based pricing, we can continue to steer the conversation away from the cost of time and toward shared values and results.

In addition to building participation into our process, we continue to develop service packages with increasing clarity and responsiveness to the needs we uncover in our target clients. In designing FORM Coalition's service offerings, I've been inspired by examples like Sarah Hobday-North and YARD & Company. Hobday-North is an Australian architect whose company, Value Architects Group, offers “Super smart architectural services at fixed prices. No surprises.” In doing so, she’s able to serve nonprofits, small developers, and what she calls “community champions with a vision.” YARD & Company, a planning and development services firm based in Cincinnati, Ohio, has designed a project delivery system for a participatory predesign process; by digging deep into the value a thorough participatory process can provide and communicating this clearly in their messaging through service packages, they offer a concise invitation to client collaborators.

The Latrobe study names “expanding disciplinary and professional boundaries” as a strategy that has proven effective for impact-oriented firms. In our strongest projects, we work closely with community engagement specialists and facilitators. This has the dual benefit of strengthening our capacity as a team, while also lending credibility to our effort through the trust they have established as a community partner—it’s not intuitive to hire an architect to lead community engagement. Similarly, I’ve enjoyed successful partnerships with economic development professionals and look forward to an expanding network of interdisciplinary collaborators as we continue to grow. To illustrate our approach, what follows are descriptions of three projects from our first year in operation.

4.1 Fulton—Participatory “Placemaking”

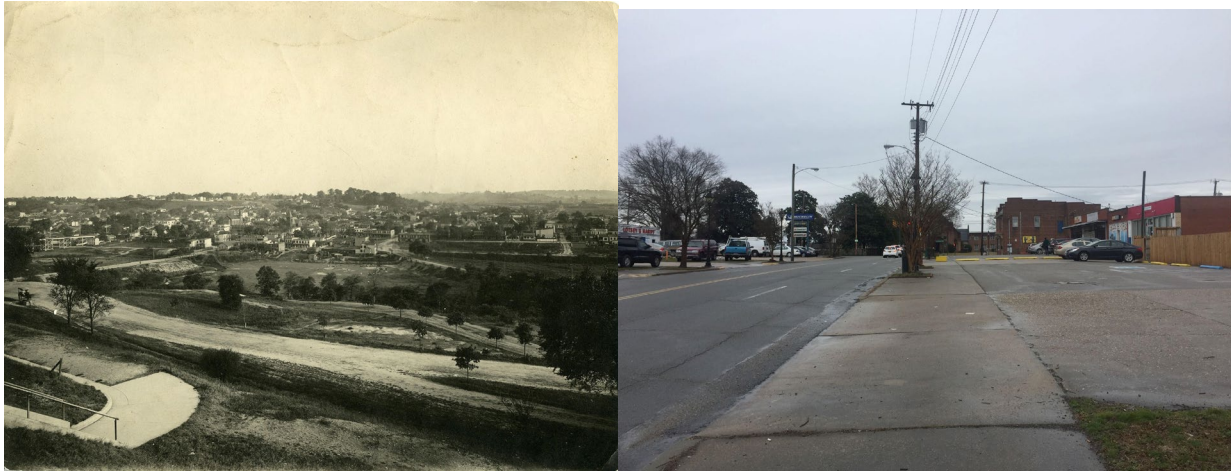


Figure 7: (L) Historic Fulton (The Valentine Museum)

Figure 8: (R) Commercial corridor, Fulton, Richmond, Virginia (FORM Coalition)

Greater Fulton is a collection of neighborhoods in Richmond’s East End. It’s a historically Black, working-class area that’s seeing a quiet resurgence after decades of disinvestment and crime. The original Historic Fulton was a thriving community of homes, businesses, and churches that was demolished as part of an urban renewal project in the 1970s—almost no trace of the original structures remains (Figure 7). More than eight hundred homes, businesses, and churches were destroyed, and the families who lived in them, displaced. The area’s remaining commercial corridor is a monument to autocentric urban planning (Figure 8). It’s grossly underutilized, both in terms of building stock and in general land use and density (Figure 9).

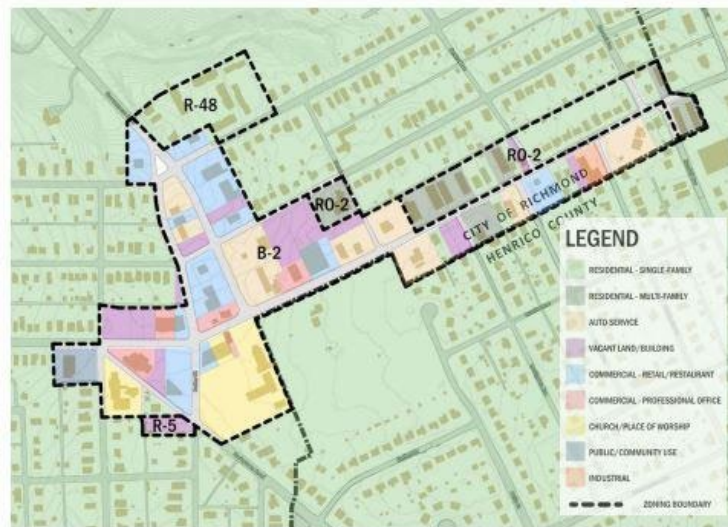


Figure 9: Existing land use and zoning (2019), Fulton, Richmond, Virginia (FORM Coalition)

FORM Coalition was hired by Innovate Fulton, a local economic development nonprofit, to build on a community engagement and planning effort that had been conducted by the local community center (Neighborhood Resource Center of Greater Fulton) in partnership with Local Initiatives Support Corporation (LISC) in 2011. We worked with a self-selected group of neighborhood residents to solidify a set of design priorities, then illustrated them and presented them to the community for feedback. As a result of our work together, Innovate Fulton now has a complete set of concepts to display in their office (and tote to community meetings), demonstrating plans to improve Transit and Transportation, Green Infrastructure, Housing, and Culture and Community (Figure 10).



Figure 10: Community engagement, Fulton, Richmond, Virginia (Jaclyn Brown)

Unlike the traditional means of engaging an architect once the land or space is secured, providing a venue for proactive conversation about development *before* developers are involved was extremely rewarding. In reality, it necessitated some flexibility and creativity regarding compensation, including assisting the client in a grant application so they could pay our fee (we got the grant). Additionally, we gathered valuable data about the time and effort involved, which will help with appropriate fee setting in future projects.

4.2 Northside—Capacity Building

Over the last year, our work on Richmond’s Northside has focused on capacity building; we have been working closely with a group of business owners to develop networks, skills, and source funding as they anticipate the rezoning and redevelopment of the local commercial district.

The intersection of Chamberlayne Ave. and Brookland Park Boulevard (newly christened the ChamberBrook Business and Arts District) forms a crossroads between a collection of racially and socioeconomically separated neighborhoods (Figure 11). Historically, the corridor was the highway entering Richmond and home to a number of tourist homes (Holly 2010). The new vision for ChamberBrook imagines it as a gateway to the city and a thriving mixed-use district (Figure 12).

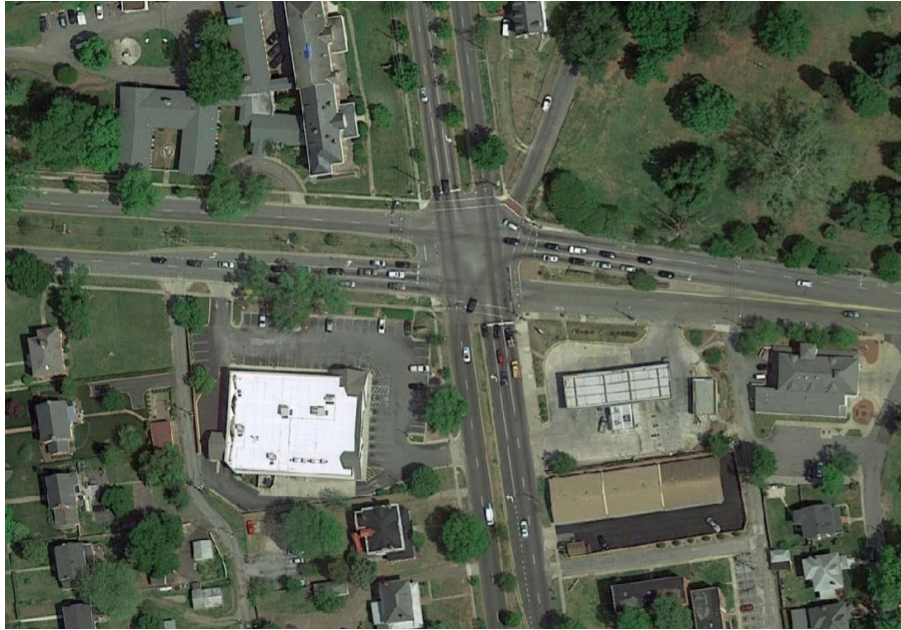


Figure 11: Aerial view of Brookland Park Blvd. (E-W) and Chamberlayne Ave. (N-S)
(Google Earth)

Over the past year, our team has completed conceptual programming and design for vacant lots and buildings, convened stakeholders around a shared vision, and advocated on behalf of our coalition as the city of Richmond made updates to their comprehensive plan. We've built momentum through small, high-impact projects like participating in Park[ing] Day (Figure 13), an international event where people construct pop-up parks in parking spaces. Much of our effort is focused on positioning landowners and business owners to steer inevitable redevelopment efforts in a community-led manner, through the formation of a business owners' association presenting a unified voice to the city and thinking about what the organizations might look like in the future.



Figure 12: Rendering of Brookland Park Blvd. and Chamberlayne Ave. (HKS Richmond)

This capacity-building process is ongoing, and unlike a traditional design process with identifiable milestones, it is slow to see wins—but this work is essential to building a proactive (rather than a reactionary) future for the area. Our team consists of architects, community engagement and lobbying consultants, and marketing and media pros. In this work, our role at FORM Coalition is to help *design the process* of moving forward. To date, there has not been a lot in the way of conventional “design” or architecture; the emphasis is on a multipronged approach that champions economic justice. The group is committed to steering thoughtful redevelopment that allows business owners and residents to remain in place as property values inevitably rise. In the absence of clear milestones, we periodically pause to look back and take stock of our victories.



Figure 13: Park[ing] Day 2019, Brookland Park Blvd. (FORM Coalition)

4.3 City Yard—Multidisciplinary Teaming

In the case of City Yard in Charlottesville's Starr Hill neighborhood, FORM Coalition filled the role of urban designer in a multidisciplinary consultant team of planners and facilitators. Together, we delivered a Small Area Plan for adoption into the city's Comprehensive Plan (Figures 14–16). As a small practice, we find that this is an effective way to work, particularly in communities that we are neither a member of nor have an existing relationship with (and lack the time in which to build one).



Figure 14: (L) City Yard, Charlottesville, Virginia (Google Maps)

Figure 15: (R) Conceptual Sketch (FORM Coalition)

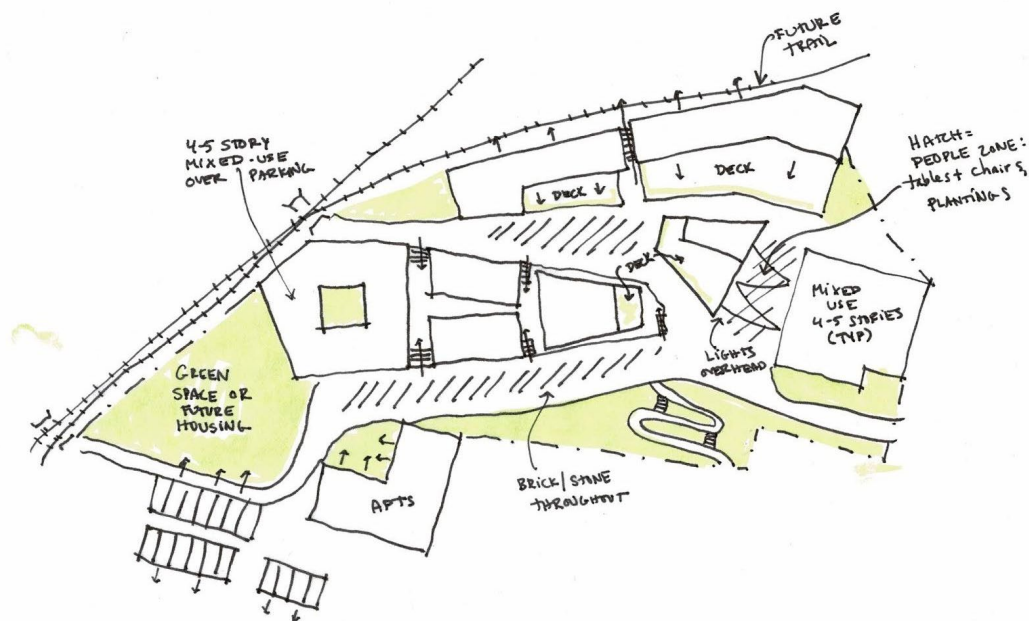


Figure 16: City Yard—Schematic Plan (FORM Coalition)

The scope itself was very much in line with our values related to racial justice and our experience of working at the neighborhood mixed-use scale. Following the Unite the Right

Rally in 2017, the city of Charlottesville, along with a nonprofit housing developer, hired our partner—a local strategic planning and facilitation consultant—to conduct an eighteen-month-long community engagement and planning process for a historically Black neighborhood in Charlottesville’s downtown core. Floricane, the lead consultant, hired local community members during the discovery phase to conduct interviews and surveys to uncover community needs and desires. FORM Coalition was hired as a subcontractor to help deliver the final plan and accompanying report.

Because of our background in working at this scale and with communities of change, we were able to get on board and execute quickly. Combining expertise with adjacent professionals is a highly effective way for small, community-minded firms to take on projects with wider-reaching impact than they may be able to achieve alone. Furthermore, it acknowledges that architecture alone cannot solve complex societal problems, but rather that solutions are achieved through a multidisciplinary approach that addresses the economic, social, infrastructure, and public health aspects of neighborhood change—and consults the respective experts.

5. CONCLUSIONS AND FUTURE WORK

As far as incorporating participatory planning into our process in a sustainable way, much remains aspirational from a business standpoint. Experimenting with fixed-fee contracts and clear scoping is certainly a learning curve for new business owners. In our first year in business, nearly half of our revenue came from contracted drafting work for other architecture firms, while two-thirds of our *time* was spent on work for our ideal clients (Figure 17).

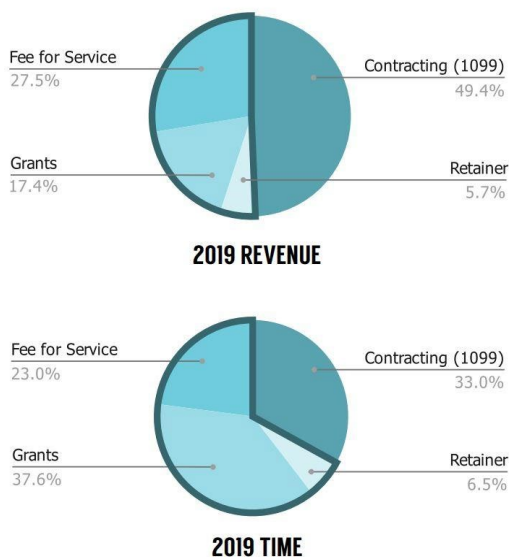


Figure 17: 2019 FORM Coalition revenue vs. time (FORM Coalition)

One of the findings of the Latrobe report was that impact design practices that thrive find creative ways to overcome funding challenges, such as expanding the types of services offered. In the near term, our focus is on innovating our way to a consistent income stream. As we move ahead, we continue to look for ways to incorporate the values acquired in the course of an impact design education: a love of hands-on learning, the importance of celebrating the agency and impact of each individual involved in our projects, and keeping our vision focused on solving the big, complex challenges of our time.

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CONTESTED TERRITORIES: EVALUATING THE LIMITS AND LIBERTIES OF DESIGN (AND DESIGNERS) IN PUBLIC SPACE

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ABSTRACT

Recent accounts in Boston highlight tensions among individuals experiencing homelessness, individuals seeking treatment for substance use disorder, service providers, advocates, residents, and business owners in geographies colloquially referred to as “Mass and Cass.” The dynamic frictions of lived experience unfold in public spaces entangled in a field of social, political, economic, and spatial conditions. The Boston Architectural College, mission-driven to “provide excellence in design education emerging from practice and accessible to diverse communities,” sits less than a mile from these geographies. A curriculum in applied learning, where practicing and learning occurs *concurrently*, distinguishes the BAC’s educational approach from co-op or externship models. Its educational agenda recognizes the vital dialogue between academia and practice and locates teaching and learning directly within these conduits.

This research-driven project focuses on the spatial, sociocultural geographies of Mass and Cass and examines the pedagogies of community participation and engagement in design education. The project addresses the nature of interdisciplinary teaching and learning in design settings through examining modes of critical thinking, listening, reflection, and translation as integral to civic spatial practices. Using the tools of spatial designers and conceptual frameworks from other disciplines, students attempt to understand the agents, actors, and forces at play in the conditions of Mass and Cass. Through critical inquiry into the sociocultural contexts that characterize the spatial narratives of Mass and Cass, students (and city agencies as collaborators) seek to identify moments when design or designers have, may have, or could have intervened in these contested territories.

Keywords: Civic Design, Community Engagement, Homelessness, Interdisciplinarity, Pedagogy, Public Space

1. INTRODUCTION

On August 2, 2019, the city of Boston mobilized multiple city departments in the policing and expulsion of individuals experiencing homelessness at the boundaries of Boston’s South End and Roxbury neighborhoods. In a coordinated effort by police and public works departments, people were displaced, personal belongings were seized and destroyed, and multiple arrests were made. Citing an incident of violent crime against a Suffolk County corrections officer, the city legitimized the self-named Operation Clean Sweep as part of “an

effort to address ongoing community concerns in the general area of Massachusetts Avenue and Southamptton Street in Roxbury” (Dwyer 2019).

In the vacuum of opaque policy agendas or motivations, a flurry of news reports and social media posts constructed a complicated series of narratives to fill the gap. Headlines signaled the mounting problems of “Methadone Mile,” the “troubled district” surrounding the Boston Medical Center, and reductively conflated the issues of homelessness, substance use disorder, and public space into a tangle of ideas, affects, and anecdotes. These narratives have lingered, migrated, and exploded. The accounts of tension among individuals experiencing homelessness, those seeking treatment for substance use disorder, service providers, advocates, neighborhood residents, and business owners have adversely positioned, accurately or not, the concerns of public health, public safety, and community “quality of life” concerns.

In “Mass and Cass,” these frictions unfold in public spaces. In these messy collisions of contested territories, what is the role of the designer? What is the responsibility of design? This paper examines the pedagogies and methodologies associated with community engagement and civic responsibility in design education. Using a recent and ongoing design research project, “Contested Territories,” in the Boston Architectural College’s Gateway Initiative as a case study, the paper addresses the complexities of interdisciplinarity in design research and praxis. As an exploration, Contested Territories explores the possibilities for civic spatial practices to become more than transactional by committing to iterative processes of collaboration, critical thinking, listening, reflection, and translation.

1.1 Mass and Cass, Not “Methadone Mile”

Boston is a small city of neighborhoods. Out-of-towners might be familiar with the romantically idealized associations with neighborhoods like Charlestown, Beacon Hill, the South End, and the Back Bay. Conversely, other geographies in the city have acquired disparaging and derogatory monikers. The intersections of Massachusetts Avenue and Melnea Cass Boulevard, in an area loosely centered around Boston’s oldest public city hospital (Boston Medical Center), are coarsely referred to as “Methadone Mile” or “Recovery Road” on account of the perceived concentration of programs and providers offering services to those seeking treatment for substance use disorder or those experiencing chronic or conditional homelessness. This paper admonishes each of these toponyms and will refer to these geographies as “Mass and Cass.”

In less than a half-mile radius circling the intersections of two major vehicular thoroughfares, three politically demarcated neighborhoods collide without any clear indication of their borders or boundaries. To the west of Mass. Ave.: Roxbury; to the east: the South End; to the immediate south: a collage of industrial infrastructures known as Newmarket (Figure 1). Demographically, socially, and economically, the contrasts between these neighborhoods are distinct (Boston Public Health Commission 2017). However, the jurisdictional outlines of each neighborhood are fuzzy. The edges of each abut or belong simultaneously to state, city, or neighborhood political designations.

Additionally, there is a recognizable shift in urban scale and fabric; Victorian-era brownstones transition into institutional medical facilities into low-density food distribution warehouses, car washes, and storage facilities. The legibility of places and their peripheries is cloudy. This ambiguity confuses claims to ownership, stewardship, and care among the multiple populations who live, work, play, and exist within these territories.

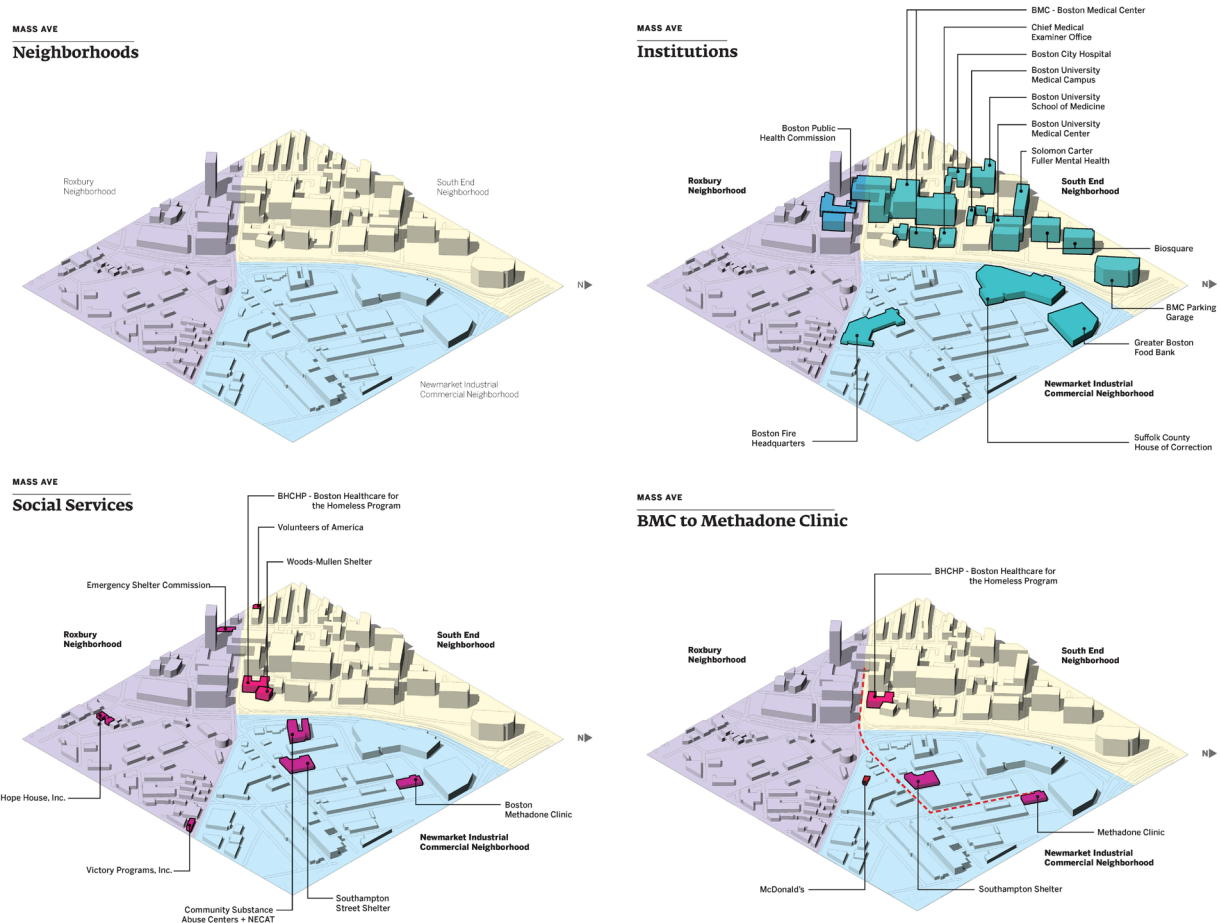


Figure 1: The geographies of Mass and Cass (Image by the MASS/CASS research group that consisted of students, educators, and practitioners from the BAC, Mass Design Group, and RISD. The project was supported by the Ada Louise Huxtable Fellowship, 2018.)

1.2 Design School in the City: The BAC and the Gateway Initiative

Less than a mile from Mass and Cass, the Boston Architectural College (BAC) offers the only accredited degree programs in architecture, interior architecture, landscape architecture, and design studies that operate through concurrent education. Unlike other programs that incorporate alternating internships or co-ops, the BAC's 130-year practice-based tradition synchronizes classroom and work-based learning, educating students in a way that encourages the attainment of knowledge and skills amid multiple settings. This approach positions BAC students to be better equipped with both professional and critical thinking

skills to participate in the profession of architecture as a civic discipline. The synthesis of applied and academic learning fosters a robust dialogue between the community of learners at BAC and the community of professional designers at large.

Aligned with the development of design skills and tools acquired in studio and technology courses, a sequence of Practice Department initiatives serves as an outlet for students to test, develop, and reflect upon skills in real-time, double-loop learning feedback systems. In the design disciplines of the college, the Practice curriculum is intentionally interdisciplinary, recognizing that active and participatory engagement with the world requires multiple disciplinary frameworks. Ideally, the experience in Practice encourages the growth of a reflective practitioner.

The Gateway Initiative is a transitional program in the Practice Department that bridges foundation studies and full immersion in concurrent learning. It presents students with the opportunity to apply newly acquired skills through projects with community partners. Gateway projects live outside of the classroom, and the design considerations are challenging. Through direct engagement with community members as both clients and partners, students are encouraged to reflect on the responsibilities and the rewards embedded in the design process. Successful Gateway projects satisfy the needs outlined by a particular client, but also often exceed these expectations—presenting complex information through new lenses, uncovering further opportunities for design, and advocating for the role of designers in the resolution of messy problems.

2. CONTESTED TERRITORIES

The Gateway project “Contested Territories” emerged from within these academic and urban contexts and evolved from relationships that had been developing over several years. Over two semesters, working with a constellation of collaborators, students were encouraged to consider a range of difficult questions. What is the nature of public space? Who does public space in the city belong to? How does design participate in or alleviate the experiences of retraumatization in public space? What is the utility of design? What is the role of the civically engaged designer in the messy intersections of contested territory? These questions aren’t formulating problems to be *solved*, but rather posit entry points for the identification of and construction of new priorities and perspectives to help guide and situate our collective work.

2.1 Fall 2019: Inquiry

Contested Territories 1, in the fall of 2019, situated these questions as the generator for research. Absent any particular client or partner, students carefully examined and contextualized a series of events in Boston, from the closure of the Long Island Shelter to Operation Clean Sweep. Using the tools of spatial designers and allied disciplines (mapping, drawing, ethnographic research), students worked to uncover, clarify, and re-present the agents, actors, and forces at play in the geographies of Mass and Cass.

Narratives about places provide essential clues about how particular public discourses shape the character of “problems” and, consequently, set the frameworks for policy and planning decisions. Through the collection and analysis of newspapers, social media posts, and informal conversations, students developed an awareness of the multiple narratives circulating around Mass and Cass. Simultaneously, students explored texts from outside of the typical architecture or theory canons. Often student-identified or recommended based

on a student's particular train of thought, readings offered students new ways of situating their ideas. Judith Butler's writing on precarity and the nature of what constitutes a life, Michel Foucault's expositions of power and personhood, and Craig Willse's analysis of the forces embedded in the construction of "homelessness" challenged preconceived ways of understanding how to define and articulate a problem.

Students recognized the implications for architecture's representational tools. As noted by Sophie Hicks, a graduate student in architecture, "how we represent our work impacts how we assign value, how we make decisions, and how we communicate these processes to larger audiences." Sophie constructed a "narrative timeline" of social media posts to understand how contested ideas about populations and places migrate, spread, and become codified as matters of fact (Figure 2).

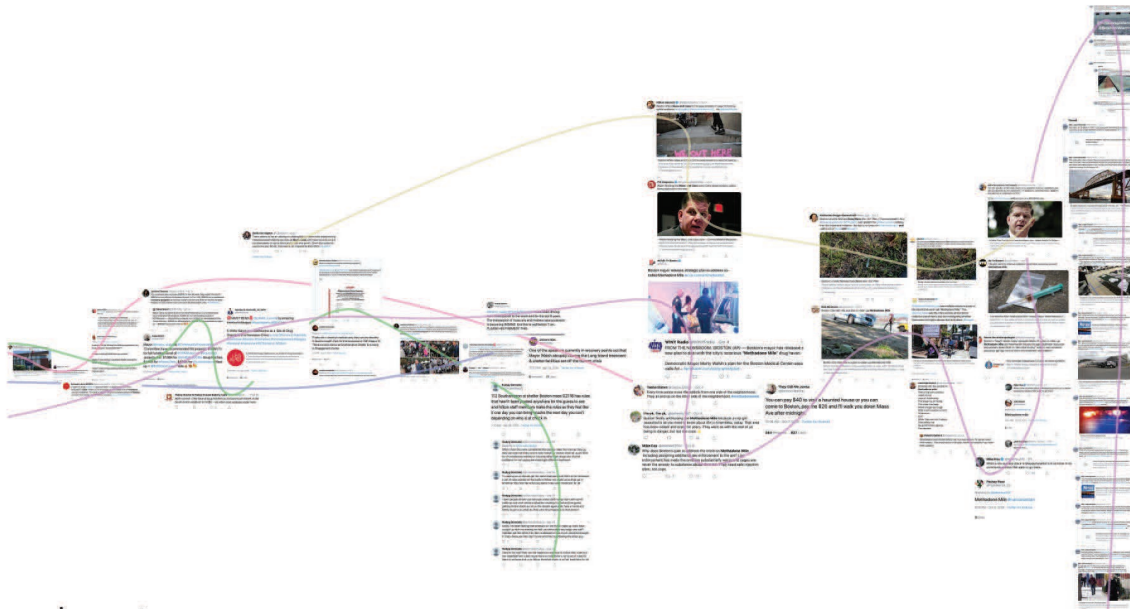


Figure 2: Contested timelines.

Using social media, this timeline offers insight into how events are documented, described, and circulated. Twitter as "territory" allows research because of its open availability and its search options. The timeline displays different users around Boston who tweeted highly publicized words or phrases such as "homeless," "shelter," "long island," or "Operation Clean Sweep"; the use of mentions (@) in the tweets highlights those who appeared responsible for specific events. The frequency of tweets varied greatly between 2014 and 2019, with the most significant spike happening around Operation Clean Sweep. (Image by Sophie Hicks, BAC, Fall 2019)

Graduate student Jason Peoples extracted pervasive words, phrases, and ideas found in local reporting and attempted to clarify (or better yet, visualize the complicated associations at play) how these narratives might illustrate the contested interests that form alliances or exclude certain populations from entering into the dialogues of specific interest groups (Figure 3).

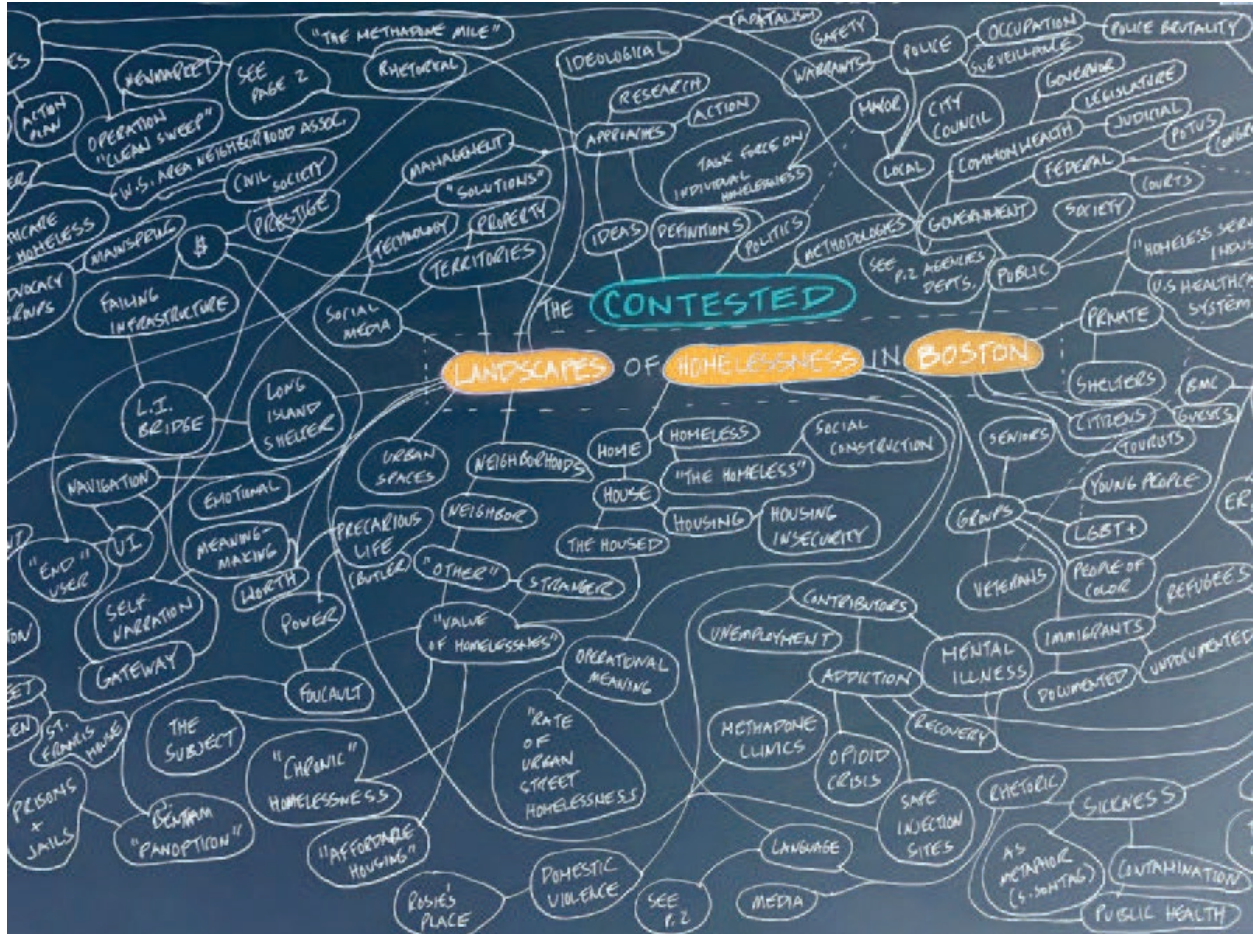


Figure 3: Contested interests.

According to student Jason Peoples, “To reveal systems, places, and forces that shape the narratives of ‘Mass and Cass,’ webs of influence were created. Beginning with a ‘contested’ scenario, we were able to map relationships between organizations and recognize the large multitude of different principles, affects, and capabilities that impact the current environment.” (Image by Jason Peoples, BAC, Fall 2019.)

As noted by the undergraduate landscape architecture student Scott LeBoeuf, the conventional tools of the drawing, the diagram, or the map “allowed for the findings to be understood at a broader scale, but in peculiar ways.” An awareness of the multiple ways of situating and defining a problem allowed students to ask more critical questions not only of their work, but also of the motivations that catalyze many of the city’s planning decisions being actualized in Mass and Cass (Figure 4).



Figure 4: Contested boundaries.

Scott LeBoeuf writes, “Territory is an area which connects power to land. Occupation, militaristic measures, or social and political processes determine territorial boundaries. The enforcement of power on territories often defines its owner. Often a territory is defined by outside political and social forces rather than its occupants. The maps provide a geographic understanding between Mass and Cass and the city of Boston. The maps contest boundaries of space. They reveal how the impact of events in one location is not restricted to its formal borders, and its consequences can extend beyond the legally drawn lines of territories.” (Image by Scott LeBoeuf, BAC, Fall 2019)

These critical inquiries spurred conversations about the roles and responsibilities of the architect in the public realm. Reflecting on the semester’s journey, LeBoeuf argues,

As designers, we are responsible for the inherent relationships and interactions with the built environment. The decisions designers make place them in positions of advocacy that promote the interests of people or an organization. To better understand how this responsibility can contribute to further problems or potential solutions, designers should be aware of society’s injustices within the social, economic, and political context. We also have to be better advocates for recognizing how design thinking can bring positive change. The

process of design is an iterative one that is most effective when it's interdisciplinary, incorporates multiple points of view, references professional expertise, and understands the desires of its end users. It is through this process that designers can show injustice, understand its context, and be better advocates towards constructive change and creating environments that are inclusive and socially conscious.

The work of *Contested Territories 2*, in the spring of 2020, evolved from these expanded notions of architecture's roles and responsibilities. With grounding in the conceptual frameworks established in the first semester, the cohort of collaborators grew to include the City of Boston's Office of Recovery Services, the Mayor's Office of New Urban Mechanics, and the Boston Society for Architecture.

2.2 Spring 2020: Situated Engagements

In the late fall, the mayor's office released a planning document, "Melnea Cass/Mass Ave 2.0," as a measure intended to address an increasingly audible public discourse around Operation Clean Sweep and the murky territories of competing interests in the Mass and Cass area (Walsh 2019). The plan reflects residents' frustrations about the responsibilities of municipal actors. The plan attempts to balance multiple civic agendas, yet effectively positions public health strategies at odds with public safety and quality of life concerns. It suggests a familiar pattern of "event-response" that perpetuates a way of operating through request fulfillment or unilateral problems often being solved without the time for reflection necessary to clearly articulate the complexities of the problems.

The Office of Recovery Services (ORS) was one of ten city departments tasked with operationalizing the Mass Cass 2.0 plan and, along with the Mayor's Office of New Urban Mechanics (MONUM), became partners in the continuation of the fall Gateway project (Figure 5). Students were tasked with aiding ORS and MONUM in the creation of a resource guide for providers and individuals seeking services in the ecosystems of social services in and around Mass and Cass. Students cataloged and analyzed service providers across the city to assess their capacities to match client needs with resources and to identify relationships, trends, and omissions. The conceptual and contextual frameworks from the fall semester helped students recognize the complex social and cultural overlays that affect those seeking resources for harm reduction, treatment for substance use disorder, and navigation through the quagmire of housing insecurity. Again, students used their critical thinking and representational tools to reframe and rearticulate geo-social-spatial narratives to offer alternative routes to redefining, reframing, and resolving the "problems" of Mass Cass 2.0.

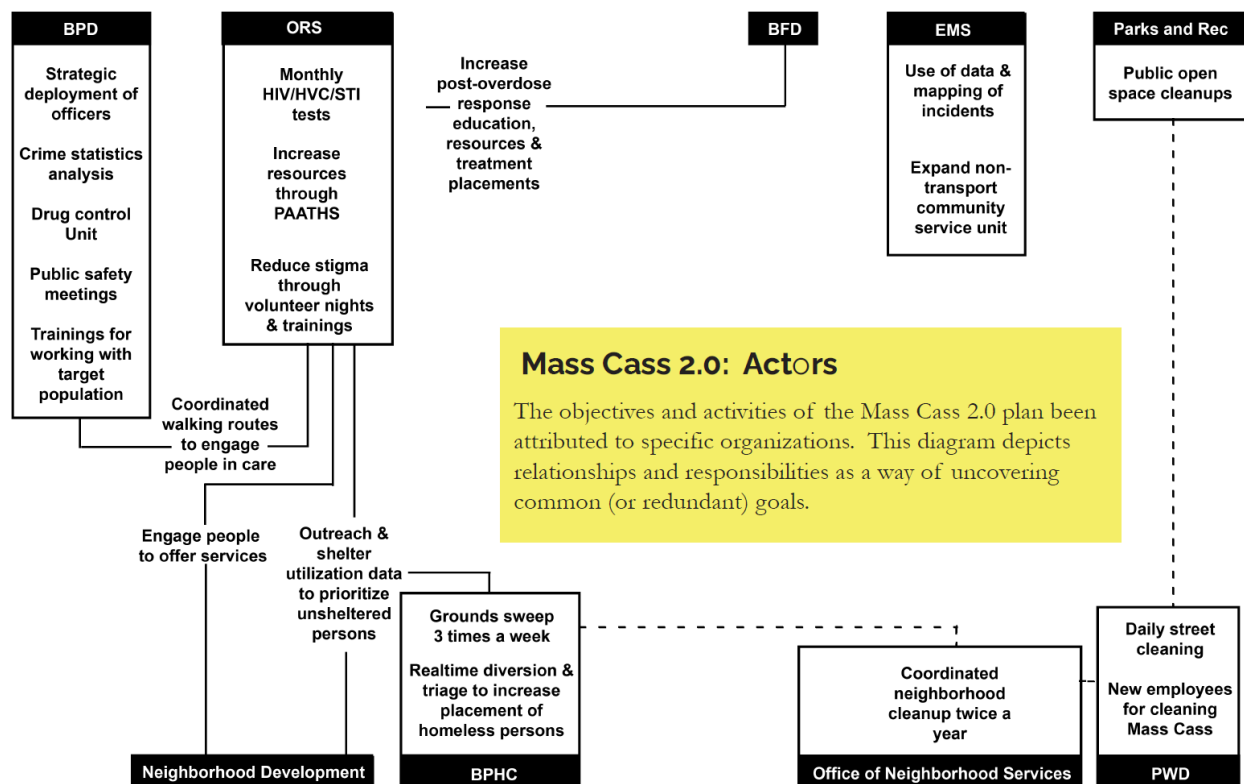


Figure 5: Alignment of Mass Cass 2.0 organizations and actions.

According to our partners from the Office of Recovery Services and the Mayor's Office of New Urban Mechanics, the analysis provided by the students has allowed for a valuable visualization of the otherwise opaque roles, responsibilities, and relationships among the city departments tasked with coordinating Mass Cass 2.0. (Diagram by Yasmine Badawi, BAC, Spring 2020.)

The undergraduate architecture student Yasmine Badawi writes in the research project document the team delivered to ORS and MONUM:

We hope that through these investigations, we can help improve experiences and reduce barriers to stabilization and recovery. This book does not propose an *answer* or framework for how to address these complexities; rather, this book aims to bring fresh critical insight to Boston's Mass Cass 2.0 plan. Additionally, there is a strong emphasis that no matter what services are available to individuals seeking help, *the opportunity to choose* must exist to recognize a person's need to be in control of their life and actions. Agency is key.

The semester's document, and its affiliated resource guide, is still in process. It is migrating laterally from academia into the world of advocacy, supported by the Boston Society for Architecture. Through this process, students have developed a growing clarity and confidence in their voices and have generated new connections and new directions for the work that keep them invested (Figure 6).

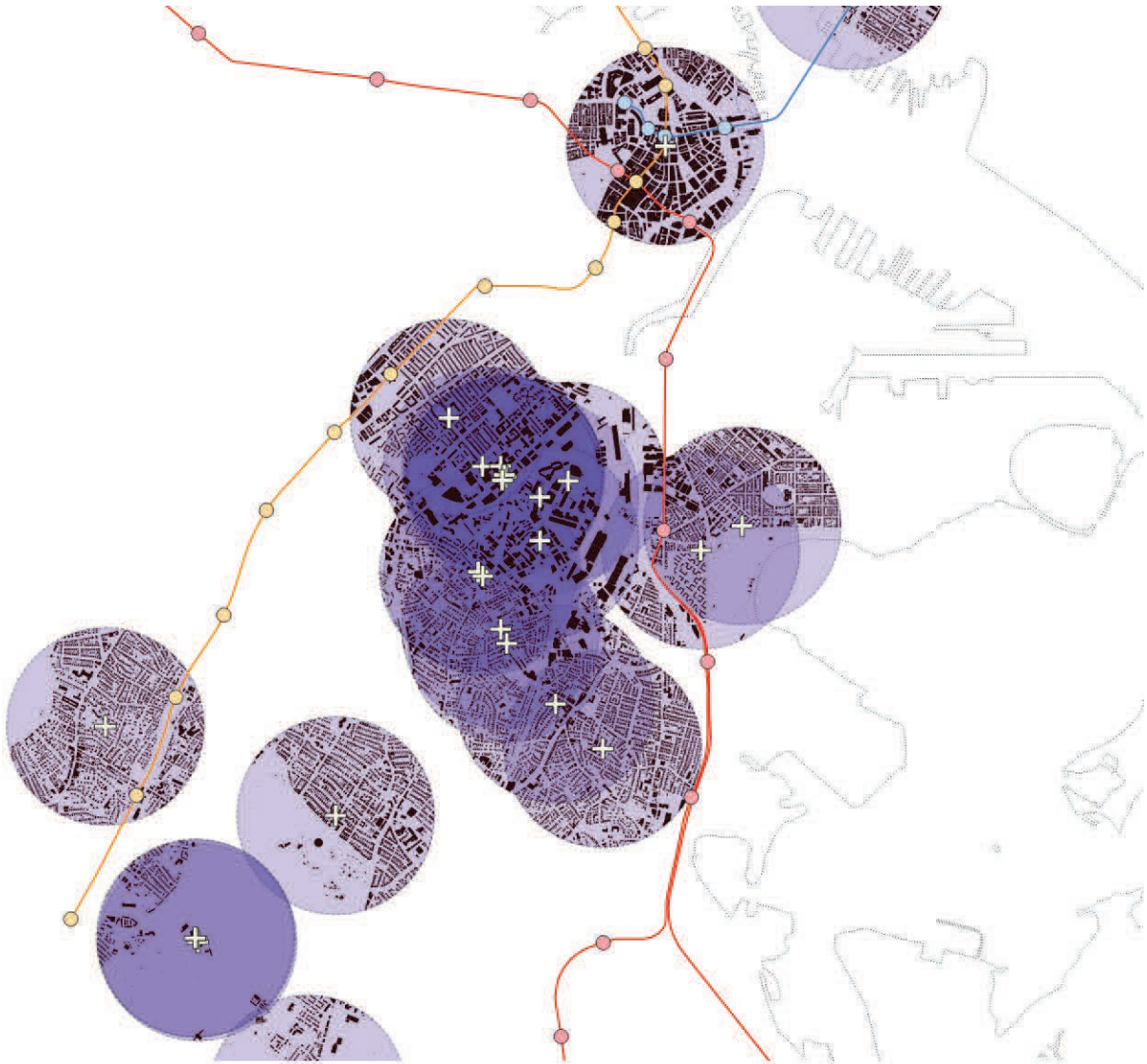


Figure 6: Mapping access and transportation to support services in Boston. Students utilized the familiar tools of GIS, Adobe, and CAD to translate spreadsheets of data about service providers and their affiliated services. Coupling this information with other city infrastructures, notably transit, layers information in a way that might help those seeking services make more informed decisions about their support service engagement. The project of mapping also offers alternative readings to the perceived “burden” of service provision often expressed by residents of surrounding neighborhoods. (Map by Ben Peterson and Kyle Warren, Fallow, March 2020.)

3. PEDAGOGIES OF APPLIED LEARNING, CIVIC ENGAGEMENT, AND CRITICAL SPATIAL PRACTICES

As the work continues to evolve from semester to semester, we are actively documenting and developing methodologies that account for dynamic social systems and shifting collaborative networks. Reflecting on the project of Contested Territories to date helps identify recurrent and emergent modes of working. A definitive pedagogical approach has not yet crystallized (and may never, to leave open the possibilities for deconstruction and experimentation), but we have attempted to prioritize methods of teaching and learning that

- center student experiences by contextualizing learning at various scales from the personal to the political;
- explore and experiment with interdisciplinarity; and
- include communication, translation, and collaboration as critical competencies for architects and designers.

Considering how these models of learning migrate from the academy into practice and the profession may suggest ways to redefine the roles and responsibilities of the architect and to recast the value of architecture. Altogether, the work has called into question a variety of ideas worthy of reevaluation: pedagogy, discipline, notions of engagement and community, and, ultimately, the agency of design and designers in the messy intersections of these “contested territories.”

3.1 Students as Publics

Community-based or civically engaged design practices often refer to an ambiguous public “outside” of the classroom as if the “beneficiaries” and “benefactors” of design processes exist in separate realms. As teachers and co-participants, we underscored that each of us (intentionally or unintentionally) encounter, belong to, or collide with any number of multiple publics. The classroom should not protect, nor sever, an individual’s relationship to communities beyond its walls. Recognition of a shared publicness opens a space where designers may challenge themselves to welcome and invite dialogue beyond their comfort zone.

The population of the Boston Architectural College represents a multitude of ages, identities, and pathways to design education and the design professions. According to its mission, the BAC offers a design education “accessible to diverse communities.” Through the mechanism of open enrollment (there are no admissions requirements), the college attempts to remove the barriers to entry that have effectively maintained the white, male composition of the profession. BAC students are largely first-generation college students, international students, or are members of underrepresented populations in design education. Demographically, 44 percent of the college’s current student body identify as female, and 44 percent identify as people of color. In comparison, according to statistics from 2019, 90 percent of those who have successfully attained NCARB’s licensure certification identify as white (NCARB 2019).

Licensing and accrediting bodies aside, Gateway projects and their affiliated Practice curriculum, while tethered to the satisfaction of degree requirements, are not bound by accreditation criteria. Moreover, participation in Gateway is voluntary and frequently self-selected. Without the obligation of demonstrating how the course satisfies standardized

“student performance criteria,” the semesters’ syllabi offer nimble structures for emergent processes. Over the two semesters, student needs and questions determined specific lines of inquiry for research. A loosely bound set of frameworks has also allowed for the accommodation of new collaborators and their shifting project desires, directives, and deliverables.

3.2 Traveling in Other Territories: Interdisciplinarity

In the closing panel discussion of March’s Schools of Thought conference, Sharon Sutton, FAIA, noted that “removing some of the disciplinary boundaries that we’ve constructed around ourselves would be a way of not just becoming more research-based, but having a broader palette for how to (re)solve problems. We have much too narrowly defined ourselves” (Sutton 2020). Sutton’s comments support several arguments for an interdisciplinary approach to design pedagogy at the intersections of civic engagement and spatial practices.

Investigations in design technologies, materials, and practices have generated new approaches to representing, fabricating, and constructing the *products* of architecture. However, the processes that contextualize and condition architecture’s adventures in the public realm—ideas about “the client,” community engagement, and social responsibility—have not received a similarly prolific or critical reframing. Those considerations benefit from outside disciplines such as the humanities and encourage literacy in other extradisciplinary discourses.

Additionally, the complexity of current issues, such as homelessness and climate change, to name a couple, requires sophisticated multidisciplinary approaches. Socially and politically minded designers do not have the luxury to remain specialists if it means they are ill prepared to engage meaningfully with shifting political climates. Interdisciplinary engagements encourage the learning of new languages and celebrate the difficult conversations that might arise with new fluencies. Contextualizing architecture and architectural education through other lenses allows for a rethinking of discipline that recognizes its limits and liberties simultaneously.

3.3 Communication and Collaboration

So much architecture training is rooted in *dialogues* that hover around the work: between student and instructor, student and student, the academy and practice. The work of Contested Territories asks how these dialogues might be made accessible to wider audiences, particularly where spatial design intersects with policymaking. In the translation and visualization of otherwise opaque planning agendas, design’s communication tools might be considered vehicles for community or civic engagement. The work of the Center for Urban Pedagogy and Interboro Partners offers references for how these tools are deployed in professional practice. Broadening access to the records of decision-making reveals the curiosities, frictions, and desires that frequently emerge in a project’s development, but often remain veiled behind “official” documents.

If architects can expand access to the messiness of process and decision-making, they may provide entry points for critical engagement about the places we share. If architects can encourage dialogue with consultants and experts from outside of the design and construction disciplines, we might more genuinely situate architecture’s role as an actor within com-

plex ecological, political, and social systems. We might be better communicators and collaborators. We might make more allies who recognize the value of architecture as a public good.

4. CONCLUSION

The tools of spatial designers combined with conceptual frameworks from other disciplines help locate, understand, and contextualize the forces at play in the city as a precursor to problem solving. Through critical inquiry into the sociocultural contexts that characterize the spatial narratives of Mass and Cass, students (and city agencies as knowledge holders and collaborators) sought to identify moments when design or designers act, through intervention or nonintervention, among these contested territories. This experiment in teaching and learning is emergent and should not be read as offering any definitive resolutions for best practice. These insights have generated, and ideally will continue to generate, more questions than answers.

We advocate for approaches to design and teaching that equip students with the tools necessary to engage processes and events with a critical eye, as an alternative to responding to problems or agendas that are “client-driven.” In our experience, the latter become encoded in language and ideas that obscure motivations and make other bodies, and other livelihoods, problematic, that is, things to be “solved.” Rather than working uncritically and accepting the role of designers as problem solvers, students have sought to interrogate the construction of the problems themselves, acknowledging both the limits and liberties of design’s engagement in these complex scenarios.

The experiences of Contested Territories suggest opportunities to rethink and reconfigure the fundamental relationships that Gateway projects (and professional relationships) accept as conventional. Committing space and time to begin the work without a “client” (or patron or partner) might encourage a reconsideration of design’s service-oriented utility in the contexts of civic engagement or critical spatial practices. If designers are to participate in resolving wicked problems, they might value time to reflect, to reframe, and to reiterate the nuances of the “problem” instead of hastily working toward a solution. The offering of design might become valued as one of instigation rather than reaction. Designers, as members of (and not apart from) a multitude of communities and publics, might not have to wait for someone else to ask for the work to be done.

The spring of 2020 has been characterized by unprecedented, intense, and rapid changes to the routines of daily life. The public health crisis of COVID-19 uprooted the ability for students and teachers to convene in proximity. Many of the BAC students left Boston to return home, often across continents and time zones. Transitioning online challenged us to consider new ways of doing community-based or civically engaged design, but it also allowed for a different kind of relationship between teaching and learning. Telecommunication tools offered shared platforms for communication. Conversations between students, partners, collaborators, and experts happened from afar, each broadcast from home bases. Opportunities for shared dialog became more immediate, more accessible, and less stymied in the vertical pipelines of communication through student-teacher-expert. If a student wanted to reach out to a partner, an author, a stakeholder, she could . . . and did.

Moreover, as cities across the country wrestle with the murders of Black and Brown bodies at the hands of police, the notion of precarity is no longer admissible as a purely academic or abstract idea. Structures of white supremacy, racism, and oppression have been

systemically operationalized and weaponized, frequently in public spaces that serve as the backdrop for violent and fatal encounters with police. Recently, in one of Boston's public spaces, a community of medical professionals and frontline healthcare workers knelt in protest and solidarity with communities of color (Griffin and Adams 2020). Recognizing that these protests are happening in Mass and Cass, we might revisit the "coordinated policing" of Operation Clean Sweep that catalyzed this work, not as the consequence of a public's safety at odds with a public's health, but as a striking example of the inflammation of their conceptual and spatial intersections.

As design education moves into design practice, the currencies of critical thinking, deep contextualization, and collaboration should endure as critical components of a designer's toolkit. These tools may be deployed in potent ways as designers engage directly with the vulnerabilities, injustices, and inequities that precede and persist beyond the inflection points of crisis. Acknowledging the persistence of conflict in specific places and among multiple publics might encourage broader contexts for inquiry: the educational, professional, and institutional frameworks that structure design's engagement with the world are themselves contested territories.

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COMMUNITY ENGAGEMENT AND SERVICE-LEARNING RECIPROCITY

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ABSTRACT

As part of the University of Oklahoma's Christopher C. Gibbs College of Architecture, the Urban Design Studio prepares graduate students from diverse backgrounds in its Master of Urban Design program to practice as urban design professionals. The studio uses a reciprocal community engagement and service-learning approach that benefits cities and residents of Oklahoma and provides students with meaningful educational experiences. Four case studies of studio projects are considered here. Each case study focuses on a different type of project, including creative urban design practice, participatory action research, community-based planning, and real-life, real-time placemaking. The studio regularly collaborates with communities on urban design studies and interventions. One such project focused on the revitalization of a three-mile stretch of Route 66 running through the heart of Tulsa. Participatory action research is represented by Tulsa Photovoice, an example of how studio faculty and students collaborate with communities to discover knowledge. Working in a more traditional framework, studio students led a community-based planning process for the downtown plan of the city of Muskogee, Oklahoma, entitled a Landscape of Hope. Finally, placemaking activities like the one for the Chapman Green illustrate how students learn by making. Each case study explains how the project was initiated, what community engagement techniques were used, and how students participated. Project outcomes are also summarized.

Keywords: Case Study, Community Engagement, Photovoice, Placemaking, Urban Design, Service-Learning

1. INTRODUCTION

With over half of Earth's 7.63 billion inhabitants now living in cities, the design of urban areas, particularly their public space, is an ever-increasing need for human safety, utility, and comfort (United Nations 2019, 9). Urban design should not be viewed as a separate discipline, but as an intersection of disciplines involved in the design, building, and management of cities. This intersection includes not only the design professions of architecture, landscape architecture, and civil engineering but also city planning, real estate development, construction, public administration, and many others (Figure 1). The vision of the University of Oklahoma Urban Design Studio is to create a community of urban designers speaking a common language to work together at this disciplinary intersection to improve the quality of life for Oklahomans and city dwellers everywhere.



Figure 1: Urban design disciplines



Figure 2: Reciprocal model

(Figures by author)

We believe that the best way for urban design graduate students to learn is to gain practical experience by tackling urban issues with community partners in a realistic setting. To facilitate this approach, the Urban Design Studio uses a reciprocal community engagement and service-learning model (Figure 2). Based on a model described by Michael Rios for evaluating community-based design, this method asks community partners to provide community engagement and learning opportunities for students in exchange for technical assistance, capacity building, or policy and decision-making support (Rios 2006, 52). The exact nature of each partnership depends on the goals of the project as expressed by the community partners. While most projects have a primary community partner, interventions in urban environments, systems, and organizations require engagement with multiple stakeholders, partners, and communities. We follow the cardinal rule of placemaking that the community is the expert (Project for Public Spaces 2000, 35). The inhabitants of the communities we engage with know the most about the environments where they live, work, and play. Community partners must be open to collaboration with these constituencies and other partners so students are exposed to the trade-offs required in design. Their work must reflect consideration for multiple points-of-view.

To elucidate how this reciprocal model works, four case studies of Urban Design Studio projects will be examined. The case studies represent four different types of projects, including creative urban design practice, participatory research, community-based planning, and placemaking. Each case study begins by describing how the studio was engaged by the primary community partner, and introduces other stakeholders involved in the project. The different engagement techniques used in the project are then outlined, followed by a description of how students were involved throughout the process. Lastly, outcomes and impacts of each project are discussed.

2. URBAN DESIGN: ROUTE 66—A STRING OF PEARLS

2.1 Community Partners

Like many Urban Design Studio efforts, this project was requested by a community partner. In this case, former Oklahoma state legislator Russ Roach, a tireless advocate for urban redevelopment and a devoted Route 66 fanatic, asked the studio to explore urban design alternatives along a portion of Tulsa's Route 66, known locally as 11th Street. The project focuses on a three-mile segment of 11th Street, starting at the edge of downtown and stretching east to Yale Avenue.

A common element of our urban design projects is to engage diverse viewpoints to guide the students in their work. An effective way to do this is to empanel a steering committee to meet regularly with the students and one another. In this case, the panel consisted of Panel Chair, Hon. Russ Roach; the Community Development director of the University of Tulsa; the Business Development and Inclusion Officer from Bama Pie Corporation; the District 4 City Councilor; the Director of Planning for the city of Tulsa; Michael Wallis, a renowned author and historian; and Kevin Anderson, a commercial real estate broker and Urban Design Studio adjunct faculty member.

The committee quickly settled on project goals. First, create an authentic cultural experience, a challenge for an area famous for kitschy folk art. Second, integrate disengaged institutions into the streetscape by removing barriers and wrapping blank walls. Third, strengthen weak nodes at intersections, encourage transit-oriented development by rehabilitating historic buildings, and add new moderate density mixed-use development on vacant lots. Lastly, redesign the street, incorporating complete street principles and using road diets.

2.2 Engagement Techniques

The steering committee formed a foundation for engagement with its many community connections with stakeholders. They met monthly to review project progress and to guide the students' efforts. The students supported the committee by preparing agendas, running the meetings, preparing materials, and keeping meeting minutes—all useful skills for their future professional practice.

To reach citizens and property owners along the corridor, students conducted asset mapping sessions, like the one conducted at the historic Campbell Hotel. The students created an eighty-foot-long map with accompanying photographs. Students asked participants to use Post-It Notes to enumerate assets and identify opportunities. The event was held in a festive environment with hors d'oeuvres, a cash bar, and music. This setting attracted more participants than would be expected at a typical town hall meeting. Many lingered and had deep discussions with the students and steering committee. One of the surprising findings was how resident reactions differed depending on how they were asked about the image of the street. If you refer to the street as Route 66, the image described is positive, kitschy, and nostalgic. If you refer to it as 11th Street, the image described is negative, rundown, even unsafe. The irony is, this is the same public space being described, sometimes by the same individual. It may seem like semantics, but this type of contradiction may expose differences between different groups of individuals. Although we did not see a correlation in this case between different groups based on geographic location, race, age, or ethnic group, asking the same question in different ways can be a useful technique.

The city of Tulsa was also beginning to rehabilitate the street using its newly adopted Complete Streets policy and guidelines. The students received a grant from Tulsa's transportation planning organization, the Indian Nations Council of Governments (INCOG), to design and host a Complete Streets workshop. Aimed primarily at city of Tulsa planners, civil engineers, public works officials, and their consultants, the workshop was designed to engage them in the many issues of streetscape design. The workshop featured the urbanist Gil Peñalosa from 8 80 Cities, who led a walking tour and gave a public lecture that attracted an audience of more than sixty. The urban design students created several Complete Streets models for the next portion of the workshop. The models consisted of design elements representing a variety of street lane configurations, parking, buildings, and street furniture. Participants were split into teams that collaborated on design schemes for Route 66 (Figure 3). Each team shared their results with the entire group at the end of the workshop for discussion and critique.



Figure 3: Complete Streets workshop (Photograph by author)

2.3 Student Involvement

Early on, while performing research and analysis, the urban design students came to the counterintuitive conclusion that the main intersections along 11th Street were weak nodes. Where you would expect high real estate values and intense use, there were instead vacant lots and blank walls. The students decided to stage a design competition to host teams of architecture and landscape architecture students from the college's main campus in Norman to develop design alternatives. They wrote a competition brief with design objectives and rules for the multidisciplinary teams to follow. The Signage Foundation, Inc., signed on as the competition sponsor and brought an interesting new aspect to the competition program by asking students to design commercial signs for the corridor.

The urban design students then organized the competition. The first step was to bring the Norman-based student teams to Tulsa to visit their intersections. When the students arrived in Tulsa, they were randomly divided into seven teams, one team for each major intersection. They were treated to lunch at the Tulsa Historical Society, where they heard stories from Representative Roach, Cyrus Stevens Avery II, and Michael Wallis. A Tulsa

Transit bus then took the teams to their designated sites for walking tours, sketching, and informal interviewing.

Once back at their studios, the teams had two weeks to create and present their visions in written, visual, and model form. A jury of design professionals, chaired by Wade Swormstedt, editor of *Signs of the Times* magazine, provided critiques and awarded scholarship prizes to the winning team.

2.4 Outcomes and Impacts

After the completion of judging, all the entries were displayed at a public exhibit hosted by the Urban Design Studio and the Lobeck-Taylor Foundation at the Numbered Car Building near the intersection of 11th Street and Lewis Avenue. Models of each intersection were displayed on the large-scale map. Bill Lobeck's vintage car collection provided a stunning backdrop for the over three hundred visitors who attended opening night. By coincidence, the winning design focused on this intersection. The design team proposed that the Tulsa Farmers' Market relocate here from their Cherry Street location. While that did not happen, the Lobeck-Taylor Foundation subsequently renovated the Tulsa Produce Market and opened the Mother Road Market and Kitchen 66, Tulsa's first food hall. It has been a smashing success, catalyzing new development and rehabilitations nearby.

Some of the students commented on how they realized that the connection between private buildings as containers of space and the public place of the street come together to create urban design. The ambiguity of the signs they designed in that space challenged many of their perspectives on what is architecture and what is landscape architecture. The innovative signage created by the design teams also attracted the attention of Councilor Ewing and the City of Tulsa Planning Department, leading to a signage overlay district. Believe it or not, the city's sign code did not allow the alluring neon and kinetic signs that helped make Route 66 famous.

3. PARTICIPATORY RESEARCH: TULSA PHOTOVOICE

3.1 Community Partners

One of the things that makes the Urban Design Studio unique is its location at OU-Tulsa with health sciences programs that do not exist at the main campus. The School of Community Medicine has been innovative in focusing its programs on community health outcomes and reducing health disparities in the state. A feature of their curriculum is the annual Summer Institute, bringing together faculty and students to take a deep dive into the communities they practice in. From the start, twelve years ago, the Summer Institute has included students and faculty from all programs, not just the health sciences. The Urban Design Studio has been involved from the beginning. At the first institutes, small student and faculty groups visited healthcare offices, nonprofit organizations, and community institutions to interview executives and providers. It soon became apparent that a resident or patient perspective was needed to balance the other perspectives. The studio was thrilled when it was asked by the School of Community Medicine to lead an effort with faculty from the Anne and Henry Zarrow School of Social Work to develop a community-based action research project for the Summer Institute.

One of the first questions to answer was how to identify which residents to interview. It was desirable to have residents from a variety of backgrounds who were geographically

distributed throughout the city. A chance conversation with leadership from the Tulsa Community Service Council led to an ideal solution. The Council's Tulsa Area Community Schools Initiative (TACSI) assisted fourteen Tulsa Public and Union Public Schools to become community schools. As community schools, they are hubs of their neighborhoods. The schools were geographically dispersed as desired. Furthermore, TACSI places site coordinators at each school who are trusted by parents and residents. The site coordinators were ideal research partners for us to recruit as participants for the Summer Institute interviews.

3.2 Engagement Techniques

We chose a powerful technique known as photovoice for our study. Photovoice is a community-based action research method based on the axiom that the community is the expert (Wang et al. 2004, 911). Four residents at each community school were recruited to take photographs of their built environments and daily routines (Figure 4). They received digital cameras as an incentive to participate. The urban design students collected the photos and mounted them on photo tiles provided to the interview teams from the Summer Institute. The interview teams were trained in appreciative inquiry before interviewing the participants at the schools. All fifty-three participants who submitted photos arrived for their scheduled ninety-minute interviews. All the interviews were conducted on the same evening simultaneously at the school sites with researchers and the TACSI coordinators present. The interviews were recorded, and participants were asked to write captions for all their photos.

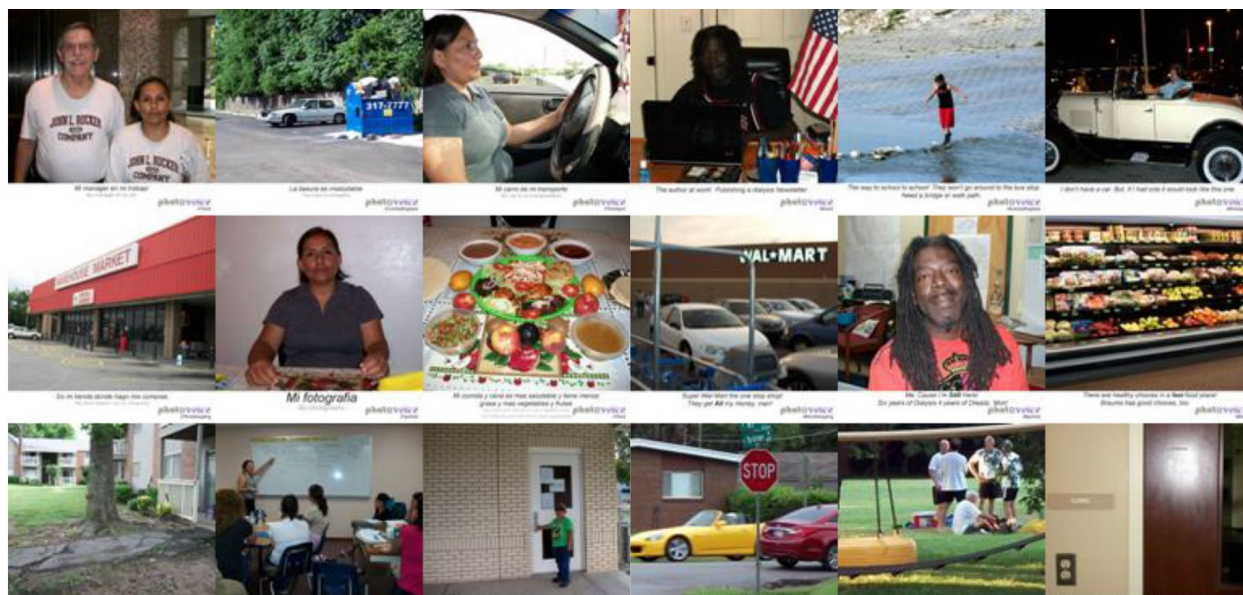


Figure 4: Gallery of Tulsa photovoice tiles (Photograph by author)

3.3 Student Involvement

Students from the Urban Design Studio and the School of Social Work were involved in every aspect of the study's design and implementation. They devised the research protocol and protections for participants. They also trained the TACSI site coordinators how to recruit and instruct participants taking photos. They developed a curriculum for appreciative inquiry that

was used to train faculty and student interview teams. They collected and processed the photos, recordings, and written notes. Finally, they organized a public exhibit with over seven hundred photographs at the Summer Institute.

After the completion of the institute, the students anchored an effort to analyze the data using qualitative analysis. A two-day workshop with faculty, arranging and rearranging photo tiles, led to a coding key to be used to classify the photos and interview transcripts. Each transcript was coded twice using the NVivo software package. The coding results were checked for inter-rater reliability. The results of the analysis became a technical research report that led to several scholarly publications and conference presentations.

3.4 Outcomes and Impacts

The Tulsa Photovoice project succeeded in providing an in-depth view into the lives of residents for the 140-plus students and faculty attending the Summer Institute. Many commented on their emotional responses to the interview sessions. Others demonstrated a better understanding of the lives of patients. Almost all were appreciative of the experience. A surprising outcome was the reaction of some of the medical faculty, many of whom had become accustomed to only interviewing sick patients in short encounters in their exam rooms. The students involved tended not to be affected by these biases and actually became model interviewers for the more seasoned faculty.

Perhaps even more meaningful were the reactions of the community participants. They were invited to the appreciation luncheon at the conclusion of the Summer Institute. The luncheon also served as the opening of the Photovoice Exhibit. Despite having to take time off from work and travel to the university, almost every participant came, and they brought their entire families! They were extremely proud of their contributions to the exhibit. Many had us take their pictures in front of their photo tiles, and many wanted photographs with the students and researchers, as well. Even more impressive were the comments we heard from the TACSI coordinators that the photovoice participants had gained confidence and were becoming involved in the activities at the schools. Some who had been invisible for years started coming more frequently and were taking leadership roles.

4. COMMUNITY-BASED PLANNING: DOWNTOWN MUSKOGEE—A LANDSCAPE OF HOPE

4.1 Community Partners

The architect Matt King's love of old buildings led him to Muskogee in search of historic preservation and rehabilitation projects that might be funded with tax credits. He found a once-grand downtown desperately in need of revitalization. The city planner, Gary Garvin, said the city had just completed updating its comprehensive plan and was looking for an urban design master plan for the downtown. As a friend and supporter of the Urban Design Studio, King arranged a meeting with Garvin and city manager Mike Miller. The Urban Design Studio was soon engaged as a community planner. Because this was a large-scale project, OU's Institute for Quality Communities, or IQC, became an equal partner.

A steering committee was formed. Former Muskogee mayor Wren Stratton chaired the group that included elected officials, downtown business leaders, members of the Muskogee Community Foundation, community activists, journalists, and city staff from Economic Development, Parks, Public Works, and the Planning Departments. Frank Cooper,

the manager of the struggling Arrowhead Mall, also joined the group and became a significant partner as the project unfolded.

4.2 Engagement Techniques

The urban design students were thrust into the project on the first day of class when they traveled to Muskogee to staff a booth at the Muskogee Farmers' Market. Students visited the market several times during its fall season to engage market vendors and customers. As the market is centrally located in the parking lot of the Muskogee Civic Center, many customers walked to it from downtown apartments or homes in adjoining neighborhoods.

Preliminary findings from the sessions at the market and work with the steering committee resulted in the decision to host a planning workshop at the Martin Luther King Jr. Center (Figure 5). Over one hundred community members attended the event, which was structured as an open house, complete with a barbeque dinner. Participants provided feedback in a variety of ways. A thirty-foot-long wallpaper collected over three hundred written comments. Students from the IQC constructed a scale model of downtown that let participants develop future scenarios as part of a design game.

The workshop was open to all Muskogee residents and notably attracted a number of African American and Native American participants, two groups that represent a significant proportion of the population of neighborhoods near downtown. The Martin Luther King Jr. Center has a robust after-school program for children in the area, and its choice as a venue helped attract workshop participants, as it was a familiar and trusted community institution. The community comments from the workshop were sorted into categories by the faculty and students. Many of the workshop participants remembered a more vibrant downtown with many more options for housing, shopping, and entertainment. But they also reflected on the effects of segregation and the erasures caused by urban renewal. These recollections led to the community's five goals: increase downtown activity, make better connections, restore historic buildings, introduce green spaces, and revitalize or reimagine the downtown shopping mall.



Figure 5: Planning workshop at the Martin Luther King Jr. Center (Photograph by author)

The workshop was also used to launch the Muskogee Collective Hope Survey. The survey was developed with the help of Chan Hellman, a professor of social work at the OU-Tulsa Hope Research Center. Hellman's work revolves around the cognitive psychology of hope. He defines hope as “the belief that your future can be brighter and better than your past and that you actually have a role to play to make it better” (Gwinn and Hellman 2019, 9). C. R. Snyder's theory elaborates further to explain that hope consists of three elements: goals, pathways, and agency (Snyder 2000, 9–10). The Muskogee Collective Hope Survey aimed to measure hopefulness in Muskogee. It also examined the support for the project goals developed at the workshop and the level of trust of local officials. The survey was used by the planning team to develop pathways and identify agents to implement the plan.

4.3 Student Involvement

The goal to revitalize Arrowhead Mall became one of the most pressing needs identified in the engagement efforts. Built in the early 1980s as part of an urban renewal project from another downtown plan, the property struggled to keep tenants and compete with newer big-box development along the Shawnee Bypass on the outskirts of town. As for the Route 66 project discussed earlier, the Urban Design Studio students decided a design competition could be a vehicle to explore pathways to transform the mall.

Four teams consisting of architecture, landscape architecture, and interior design students started the competition with a daylong visit to Muskogee that included a tour of the mall, a strategy meeting with mall management, and a treasure hunt downtown. They received guidance from guest lecturer Ellen Dunham-Jones, director of the Urban Design Program at Georgia Tech and a leading expert on retrofitting malls. Students learned about three frameworks for mall conversions: adaptive re-use and retrofit, replacement by new urban fabric, and reversion to a nature state. Dunham-Jones also chaired a professional jury that included Matt King; Ron Drake, author of *Flip This Town*; the landscape architect Tim Presley; Cristan Robertson, marketing director for Arrowhead Mall; and Johni Wardwell, representing the Muskogee Community Foundation.

4.4 Outcomes and Impacts

As part of an official planning process for the city of Muskogee, the most important outcome was to produce a document to guide future downtown development. The plan was adopted unanimously by both the Planning Commission and the City Council. At the same council meeting where the plan was adopted, the City Council accepted a \$1 million gift from the Muskogee Community Foundation to establish the downtown improvement grant program recommended in the plan. As of this writing, all the funds have been allocated and tangible results are visible along Main Street, Broadway Street, and in the Depot District, where construction of the Depot Green has begun. Changes are also happening at the Arrowhead Mall, where the main post office has relocated to an empty anchor store location.

The success of the project has also led to additional work for the Urban Design Studio and Institute for Quality Communities. We recently completed the Muskogee Comprehensive Housing Analysis and are currently working to create a Community Pattern Book for the Founders' Place Historic District.

5. PLACEMAKING: CHAPMAN GREEN

5.1 Community Partners

One day Bob Sober walked into the Urban Design Studio and said, “Hi, I am from the Urban Core Art Project, and I have a project I think would be perfect for your students.” The Urban Core Art Project (UCAP) is an ad hoc group of current and former Tulsa arts commissioners. Their mission was to bring temporary, interactive art installations to downtown Tulsa. They had completed several successful but small public art works, and now had an Art Works grant from the National Endowment for the Arts for a much more ambitious project. They had commissioned the internationally acclaimed artist Patrick Dougherty to build one of his *Stickwork* sculptures in the Chapman Green (Dougherty 2010, 17).

The Chapman Green is a one-acre park located in the core of downtown's Art Deco district. It was built in 2007 for the Oklahoma Centennial, but funds were inadequate to complete all the envisioned improvements. The park was subsequently underused. UCAP saw their work as an opportunity to activate the park and catalyze street life in the area. As we discussed the concept of placemaking as an incremental process during which the community undertook its own design and construction, the UCAP Team became excited and asked, “How do we start the placemaking process?”

Recognizing that the first step is to identify stakeholders and interested parties, UCAP and the Urban Design Studio began a stakeholder discovery process that would eventually engage a multitude, including the City of Tulsa Parks Department, Tulsa Parks Friends, Up with Trees, Tulsa International Mayfest, Land Legacy, the University of Tulsa School of Art, the Deco District, Meridia Development, Price Family Properties, Garden Deva, Project for Public Spaces, the H. A. Chapman Foundation, TYPROS Foundation, Art Alley, Kitchen 66, and others.

5.2 Engagement Techniques

The urban design students once again led the way by conducting regular stakeholder meetings and workshops. They borrowed a technique from Candy Chang called *I Wish This Was* (Chang 2010). Students posted stickers in the lobbies of apartment buildings and restaurants near the Green, asking residents and diners to share their visions for the park. Results from the stickers filled out by residents indicated a need for shade, places to sit, and better accommodations for dogs. There was also a desire for activities in the park, including exercise classes, live music, movies, and festivals. It was quickly recognized that the need to accommodate dogs, particularly their biological needs of elimination were in direct conflict with the desire for activities using the same grassy lawn. The introduction of new residents in rehabilitated office buildings around the park was driving both trends, something we might have missed without the feedback from the apartment dwellers. The director of Tulsa Parks and her staff provided expertise to propose doggie go-zones based on designs found at airports and other areas with limited green space. These designs were then modeled on a scale model that was easy to manipulate, so that stakeholders could test these and other design interventions quickly during the ideation phase.

5.3 Student Involvement

In addition to coordinating the engagement activities, the students were busy assisting UCAP with the *Stickwork* sculpture. Not only did they work directly with the artist to build the

sculpture, but they also recruited and scheduled over one hundred community volunteers to help with the construction (Figure 6). They got their feet wet in organizing and managing an event by hosting a Picnic in the Park with live music, food trucks, and art activities. Learning that management is at least as important as design, the students set out to write a grant to fund park programming. The H. A. Chapman Foundation Trust granted their request, providing funds to Tulsa International Mayfest for a series of activities and festivals on the Green.



Figure 6: Students and community volunteers with the artist Patrick Dougherty and members of the Urban Core Art Project in front of *Prairie Schooners* (*Prairie Schooners* is a work created by the artist Patrick Dougherty with the help of community volunteers. It was sponsored by the Urban Core Art Project and funded by a National Endowment for the Arts Design Works Research Grant. Photograph by author.)

The students also conducted field research using direct observation and time-lapse video cameras to record park usage before, during, and after the park interventions. Their results formed the basis of the evaluation report for the National Endowment for the Arts. Thanks to the generosity of UCAP, the students were also able to travel to St. Louis to survey public art by visiting the City Museum, Citygarden, Souldard Market, and Laumeier Sculpture Park. The trip to St. Louis exposed the students to what a program of public art can do to transform a city and expanded their thinking beyond the focus of one site and one sculpture.

5.4 Outcomes and Impacts

The opening of the *Stickwork* sculpture dubbed *Prairie Schooners* by the artist garnered much attention for the park. Park visitors came to see the work and walk through it. Other artists photographed and painted it. UCAP did not rest on its laurels but immediately commissioned another sculpture, *Be the One*, conceived by faculty at the University of Tulsa School of Art and executed by the local artist Chris Morphis at Garden Deva. Other artwork was installed across the street at Art Alley, spearheaded by the studio alumna Kelly Cook and the restaurateur Libby Billings with a grant from the TYPROS Foundation. TYPROS followed up by hosting their annual tactical urbanism event, StreetCred, at Art Alley.

Events staged by Tulsa Mayfest have also been highly successful. As another local art organization with experience staging the annual Mayfest celebrations, they are a perfect strategic partner. They have hosted numerous events at the Green in the last year, including the Fairy Festival. One unanticipated impact was the adoption of the park by the fairies who kept showing up at subsequent unrelated events. Students also became deeply attached to the park, with two of the students actually finding a residence across the street.

6. CONCLUSION

The case studies presented here demonstrate how a reciprocal approach can successfully meet student learning objectives while creating significant community impact. Student reflections and assessments from these projects indicate that the students acquired knowledge, obtained skills, and developed values, helping them grow as urban design professionals. Specific learning outcomes noted in student reflections include increased knowledge of urban structures and frameworks, appreciation of cultural heritage, and a better understanding of the use of implementation methods by planners and policymakers. They also demonstrated increased skill using urban design analytics, improved three-dimensional creativity, and higher levels of confidence and agency. Urban Design Studio graduates consistently report in alumni surveys that they use what they learned at the studio every day in their firms and offices.

Community partners also report benefits from the technical assistance, capacity building, and policy support received from these projects. The projects led by students have been rated to be of as high a quality as those performed by professional consulting firms. Furthermore, community residents have shown great enthusiasm for the students' work and higher levels of trust of officials willing to work in an open collaborative partnership where many viewpoints are presented and respected.

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OBLIQUE PEDAGOGICAL STRATEGIES: IMPROV AND SPECULATIVE REALISM IN SUPPORT OF SOCIAL JUSTICE DESIGN EDUCATION

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ABSTRACT

This paper acknowledges the extent to which the majority of people who work in the field of architecture are white, examines the way that whiteness in the prevailing charity-service model of community-engaged design undermines meaningful social justice design, calls for dismantling white cultural dominance in architectural education, and outlines a pedagogical method that has shown some promise in uncovering blind spots caused by dominant culture belonging that commonly prevents architects from understanding the experiences of others during design analysis, especially where asymmetrical privilege exists, such as in the field of community-engaged design. With roots in improvisational theater tactics and a thinking framework from speculative realism that helps undermine defaulting to traditional hierarchies, these oblique pedagogical strategies appear to expand student capacity for open inquiry and self-reflection, revealing previously invisible biases, and may point to more meaningful social justice design with community. The hope is that this is an entry to providing transformative education in undergraduate architecture studios that creates unfettered creative space for students of color and productively reveals bias to white students. The concern remains that the tactic persists in centering white feelings of comfort in a way that erases BIPOC distress in the studio. Early experiments with this pedagogical approach showed promise in a fifth-year undergraduate capstone studio at Jefferson University focused on how architects (a largely privileged population) can form alliances with communities experiencing gentrification (a largely marginalized population) and again in a second-year undergraduate studio deployed within a design fundamentals curriculum at the University of Wisconsin–Milwaukee School of Architecture and Urban Planning.

Keywords: Community-Engaged, Improvisation, Pedagogy, Site Analysis, Social Justice Design, Speculative Realism

1. INTRODUCTION

An often-repeated statistic where I live is that there are only eight black people licensed to practice architecture in the entire state of Wisconsin. Upon checking the *Directory of African American Architects*, I see that seven are listed today. Wisconsin is not alone in this distinction, with twenty-four states in the directory listing ten or fewer African American architects licensed in the state. Five states list *no* African American architects (Mann and Grant n.d.). Wondering if this could possibly be an anomaly of our state rather than the result of a federally regulated profession, I used NCARB's "Licensing Requirements Tool" to confirm that the five states with no African American architects do regulate the profession of architecture through licensure, required work experience, and the completion of the ARE

(NCARB n.d.). A comparison of the total number of licensed architects across all US jurisdictions (115,316) to the total number of licensed African American architects (2,325) reveals that 2 percent of licensed architects are Black (NCARB 2019, 23; Mann and Grant n.d.). Several reports confirm what is obvious, that African American and all BIPOC architects represent a small fraction of licensed architects, a little more than one-quarter overall (Griffin and Yang 2015; AIA 2016). Acknowledging that the number of licensed architects in a state does not account for all people engaged in architectural labor (who might be labeled designers, academics, artists, unlicensed professionals, or licensure candidates), these data give a very clear picture: that most people who practice architecture are white.

Architecture's entanglements in white cultural dominance in the United States are many, and in this paper I work on uncovering some ways that the whiteness of architecture undermines the field of community-engaged design, call for dismantling white cultural dominance in architectural education, and outline a pedagogical method that has shown some promise in uncovering blind spots that can prevent architects from understanding the experiences of others during design analysis, especially where asymmetrical privilege exists, such as in the field of community-engaged design.

As designers and educators, we must do a great deal of work to overcome the training that instructs us not to see the value in the aesthetics of the marginalized communities we seek to engage. One thing I offer here is a way that design pedagogy rooted in improvisational theater (improv) and scholarship around nonhuman entities can serve to sensitize students to their own blind spots and architecture's Eurocentric bias. To achieve equitable community-engaged design practice, students need oblique strategies to overcome a near-inescapable design culture and human point-of-view biases. In other words, indirect or apparently tangential approaches to design practice may offer new perspectives that are impossible to see when we are committed to our habitual ways of working.

Scholarship that decentralizes humans in the field of speculative realism and object-oriented ontology (OOO) makes space in architecture for exercises in which students invest in exploring the point of view of a nonhuman entity. Exposure to this ontological value framework within explorations that privilege nonhuman points of view are also instructive in the ways that many humans are treated as less than or not fully human in practice.

Structuring undergraduate studio assignments using improv tactics provides levity and medium unfamiliarity that engenders trust among classmates and dilutes student instincts to perform correctness by traditional architectural means. References to theater in general amplify the understanding that we are playing a role—and the performance of one role (nonhuman entity in the neighborhood) momentarily eclipses the performance of another role (preprofessional architect) that often confounds open exploration in studio.

Early experiments with this pedagogical approach showed promise in a fifth-year undergraduate capstone studio at Jefferson University focused on how architects (a largely privileged population) can form alliances with communities experiencing gentrification (a largely marginalized population) and again in a second-year undergraduate studio deployed within a design fundamentals curriculum at the University of Wisconsin–Milwaukee School of Architecture and Urban Planning.

Most of my students have been white. Much as in the profession as a whole, BIPOC architecture students make up about 20 percent of the total population (Griffin and Yang 2015). I would not hazard a guess as to what percentage of the white students I teach have a willingness to examine the ways that they are complicit in systemic racism, but I can say

that all of them, like me, require education and experience to overcome the blindness conferred by belonging to the dominant culture. The oblique pedagogical methods I am developing in design studios appear to help reveal blind spots so that students can engage more meaningfully in self-reflection and equitable community-engaged design practice. My hope is that this is an entry to providing transformative education in undergraduate architecture studios that creates unfettered creative space for students of color and productively reveals bias to white students. My concern is that the tactic remains white-centered and may cater too generously to the notion of white fragility (DiAngelo and Dyson 2018) as Barbara Applebaum describes in her exploration of supporting without comforting white students as they confront race in the classroom (Applebaum 2017).

2. PATERNALISTIC CHARITY ENCODED AS COMMUNITY ENGAGEMENT UNDERMINES SOCIAL JUSTICE IN DESIGN

The terms “community-engaged design” and “public interest design” are used interchangeably by practitioners to refer to design work done in the service of “people and communities who cannot afford to pay for architectural and related services and design for the broader public good” (Feldman et al. 2013, 4). The inability of the client to pay for design services is part of what defines community-engaged work as such and renders the delivery of services charitable. Community design organizations report that they work mostly for “underserved” and “urban” communities (ACSA 2015)—codes for poor, Black, and Brown.

The Association of Collegiate Schools of Architecture’s “Community Design Directory” tells us that community-engaged design services are rendered by privately owned firms, design organizations in academia, and design nonprofits (ibid.). Public interest design services are often rendered pro bono by privately owned firms (OnePlus n.d.), and “very few community design organizations offer services at a market rate, with the majority operating on a negotiated fee or pro bono basis” (ACSA 2015).

Most community-engaged design practices are small academic groups of one to five part-time staff (often including faculty) that rely on student workers who are compensated through academic credit, a stipend/wage, or internship hours or who are not compensated.

Academic organizations that offer services on a negotiated fee basis are most likely to pay participants a stipend or wage, while those offering pro bono services are more likely to offer participation through elective courses for credit. In the nonprofit sector, volunteer participation is the most common regardless of client fee structures. (ACSA 2015)

Private firms also engage in public interest design through pro bono work, noticeably through Public Architecture’s OnePlus program, “the largest pro bono design marketplace in the world,” which connects nonprofits to architecture firms that have committed at least 1 percent of total billable hours to pro bono work. Firms who participate in the program are encouraged but not required to compensate employees who work on pro bono projects (OnePlus n.d.). Of 2019’s top fifty architecture firms acknowledged by *Architect* magazine for excellence in design, business, and sustainability, forty-eight of fifty affirmed that they do pro bono work at up to 5 percent of total billable hours, with the median number of billable hours dedicated to pro bono work at 1 percent (Karlin Research 2019).

Predesign, organization, visioning, strategy, and ideation labor is emphasized across community design organization types. While technical services might be offered at the

discretion of the firm, the OnePlus FAQs for nonprofits (i.e., those who would be clients) advises starting with predesign and early-stage strategic planning or “request[ing] visualization and graphic communication service to support capital campaigns” (OnePlus n.d.). Among nonprofit and academic community design entities, the most commonly listed services include design, workshops, community organizing, research, sustainability, planning, and programming (ACSA 2015). Technical services, including construction documentation, construction/fabrication, and engineering, which are most commonly situated in later design phases and are those that carry the heaviest liability, fall to the bottom of these lists. The OnePlus FAQs for designers suggest that doing early design work well can lead to more work: “For example, a firm may be retained to create a pro bono sustainability analysis and then later hired to implement the plan on a full-fee basis” (OnePlus n.d.). The creative and relational engines that power the early stages of design are more commonly offered for free than the technical products of the later design phases, especially when the sacrificial labor of the former might lead to full compensation for the latter.

The charitable model described above for rendering community-engaged or public interest design services and education is problematic because it persists in putting an overwhelmingly white group of people in the position of delivering design “to” rather than “with” poor communities of color. As Paolo Freire argues in *Pedagogy of the Oppressed*, the oppressor cannot also be the liberator without participating in the racist structures that marginalized these communities in the first place. Freire also notes the dehumanizing impact of “false generosity” in a paternalistic system (Freire 2002, 54), which resonates strongly with the marketing and positive PR motivators latent (and sometimes explicit) in the world of public interest design work. For community-engaged design to become a robust part of conventional practice that does not participate in white supremacist systems of oppression, we have to both rebuild the field of architecture so that its practitioners reflect its participants and immediately transform the way that white architects engage in design with oppressed people. We should do away with the codes that hide the paternalistic nature of the charity-service model in architecture, reflect on the ways that racial inequity neuters the possibility of authentic social justice design, and push for new modes of practice that support long-term sustainable transformation of the relationship between design and community.

I do not suggest that charitable activities should cease in design altogether and agree with L. N. Badger’s point that “charity-based paradigms may be supportive in critical direct service-based tasks, such as those necessary to operate community food pantries”—perhaps analogous to emergency shelter design and fabrication in architecture. I agree, furthermore, that the place to begin “reset[ting] student expectation toward democratic collaborative practice and away from alienating charity paradigms” is by increasing opportunities for self-reflection and placing an emphasis on collaboration with community and long-term relationship building that may resist neat alignment with academic structures like grades and semesters (Badger 2017, 372–73). I would add that practices of self-reflection in the classroom, as I discuss shortly, must be integrated into nonelective courses such as design fundamentals studios at the undergraduate level. If we intend to transform the field of architecture such that it supports students and practitioners of color, then it cannot be optional for white students and practitioners to do the work to uncover blind spots, entitlements, and complicity that arise from belonging to the dominant culture.

3. OBLIQUE STRATEGIES FOR SOCIAL JUSTICE-ORIENTED SELF-REFLECTION IN THE ARCHITECTURE CLASSROOM

Architecture students cannot begin to unpack their entitlements and complicity in the way that the built environment contributes to oppression until they understand that a difference exists between their experiences of place and others. Since the last time I taught studio, the protest movement in response to the murder of George Floyd has put white people, marching in solidarity with Black people, in neighborhoods that many have likely never experienced at a walking pace. I am hopeful about the influence this lived experience and physical encounter with Black space will have on architecture students and curious about the ways this will weave into the work of self-reflection in studio I describe below.

I am working with undergraduate architecture students on shifting the tendencies that make the charity-service paradigm outlined above so problematic: an overeagerness to solve perceived problems using information from an unexamined white perspective, confidence that dominant cultural expression is the right cultural expression for everyone, and the conviction that product is more valuable than process, as evidenced by the practice of giving away process labor much more freely than product (or technical) labor in academic, nonprofit, and private pro bono community-engaged design work. How might architects and architecture educators, an overwhelmingly white group, work with an overwhelmingly white student population to meaningfully shift the ways that whiteness impacts our work, especially in the direction of liberated social justice design practice, while building an inclusive learning experience for all architecture students?

In undergraduate architecture studios, I am developing oblique strategies to help architecture students uncover blind spots created by their belonging to the dominant culture, ease tension around productively admitting ignorance, practice empathizing with others, and develop what I hope are more meaningful social justice design practices whose value arises from the integrity of the process instead of a constant drive toward product. An oblique strategy in an architecture studio, like those offered in the eponymous card deck developed by Brian Eno and Peter Schmidt as an “intervention into the artistic process” (Eno and Schmidt 1979; Mitchell 2011), prompts students to engage communities and contexts by unobvious means. Where Eno and Schmidt might, for example, suggest “gardening, not architecture” (1979) in music composition, I do this by incorporating elements of improv into the studio exercises I design and, increasingly, offering intersections with nonhuman entities using a framework for thinking provided by speculative realism throughout the studio learning experience.

Being white in a white supremacist culture causes blind spots. This is well described by the Johari model, in which the four quadrants of a square (like panes of a window) represent the possible combinations of self-knowledge and the knowledge of others. The two relevant squares are those that represent blind spots (information that is known to others but not to oneself) and the unknown self (unknown to both self and others); the aspects of one’s self that are “unknown to many people, because they have never had reason to engage it” (Carragher and Smith 2017, 222). The majority of current architecture students, who are white, will not have had reason to experience the consequences of race in the built environment as a result of their belonging to the dominant culture. White architecture students, as all white people, including me, are not exposed to the racial stress that people of color experience regularly (DiAngelo and Dyson 2018, 1). We do not experience the distress that contrast with the dominant culture encoded into the built environment constantly causes. We do not experience much “othering” or difference at all, except where

matters of taste or style (often driven by economic class) come into play. In a population that is blind to all but the most superficial experiences of difference, how might the parts of the design process that are explicitly about observation acquaint us with what it might feel like to be an “other”? The process of analysis, often taught as being exclusive to the beginning of a design project, has two qualities that make it opportune territory for blind-spot hunting: it is endemic (if anemic) in architecture, and it is the only part of the design process devoted completely to carefully observing existing conditions.

Pedagogical methods for teaching analysis rooted in both improv and speculative realism afford oblique approaches to questions of race that can be difficult to confront head-on both because the blind spots we are looking for are in the “unknown” Johari window territory of things we don’t know we don’t know, and because inquiry that threatens to expose white complicity in racist structures can shut down curiosity for fear of being labeled a bad person (DiAngelo and Dyson 2018, 71). As I continue to develop these oblique strategies in undergraduate design studios, I seek to transform the ways that this approach centers my and my white students’ feelings by softening direct encounters with complicity in racist structures.

I noticed the confluence of white racial bias and the productive uncovering of blind spots in a studio I designed in 2017–18 with fifth-year undergraduates in the B.Arch program at the College of Architecture and the Built Environment at Jefferson University in Philadelphia. The studio, called *Betwixt and Between*, examines ways that theories of ambiguity can help architects shift from a product- to a process-oriented approach in support of communities experiencing gentrification while also acknowledging that the designed proposals will not constitute solutions. To do this, we investigate concepts of liminality and ambiguity through seminar-style discussion of a limited set of readings, multisensory media work, and architectural drawing like the large-scale axonometric drawings shown here by students in the 2017 studio (Figure 1).

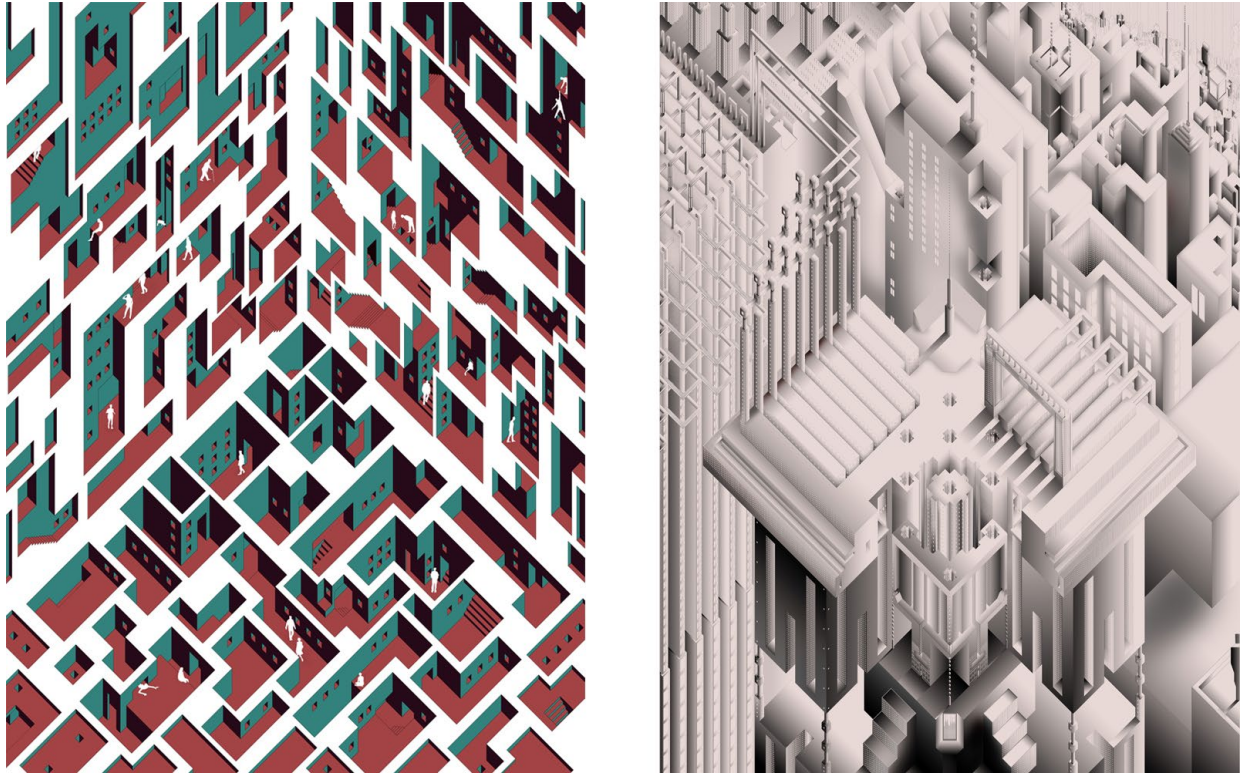


Figure 1: Axonometric liminality drawings (left by Jason Trutner, 2017; right by Yonatan Levi, 2018)

The studio is sited in a mostly African American, low-income, environmentally marginalized neighborhood on the banks of the Schuylkill River in Southwest Philadelphia called Kingsessing that is rapidly experiencing expanding gentrification spreading south and west from University City (the neighborhood that includes the University of Pennsylvania and Drexel University) and historically diverse and financially stable nearby West Philadelphia neighborhoods such as Cedar Park to the north. Very few of the students in the studio had ever ventured to this part of the city.

At first, I used improv as a pedagogical tactic instinctively as a way to prolong a state of ambiguity and inject a loosening levity during the early phases of an architecture project—that is, during the site analysis period when students are getting to know the Kingsessing neighborhood and its inhabitants. I adapted the improv game “Party Guest,” in which one actor plays the host and other actors are each given a secret identity, which they must act out in the setting of a party and which the host must endeavor to guess based on behavior. Just as in Party Guest, each student in the studio adopts a new secret identity for the duration of the site analysis exercise—I generate many possible nonhuman entities, and we pick them randomly out of a hat. Each student must then represent the neighborhood from the perspective of this entity using as many senses as possible and preferably using time-based media such as comics, film, or performance.

For example, the still below from Kelsey Donato’s short animation (Figure 2) depicts Kingsessing from the perspective of an invasive plant persisting along a neighborhood street, even as gloved hands appear repeatedly to suppress its growth. Even a still frame of this animation is notable for its quiet, nonjudgmental observation of the relationship

between plant and neighborhood, and although it overlays the value of undesirability on the plant itself via the frustrated efforts of the gloved hands, it does not attempt interpretation by demographic statistical means, a common analytical default in undergraduate site observation exercises.



Figure 2: Still from stop-motion animation exploring the perspective of an invasive plant in Kingsessing, Philadelphia (by Kelsey Donato, 2018)

The improv roots of this exercise, clearly outlined with students, provide levity that engenders trust, builds willingness to experiment, and dilutes students' instincts to perform correctness by traditional architectural means. Almost none of the students had ever been asked to work in the medium of improv, and very few had ever been asked to work in time-based media that incorporated many senses. This leveled the playing field and produced an array of deliverables, from comics to short films, acoustic experiences, interpretive dance, and small installation prototypes. No student defaulted to drawing alone or to charts and graphs describing the demographic makeup, average economic means, or educational achievement of people in the neighborhood. The neighborhood is not an objective set of data points to be listed, a tragedy to be healed through charity. It becomes, through the make-believe window afforded by the assigned nonhuman role, rather more like the experiential field it is in reality.

I propose that the capacity this exercise builds to experience the neighborhood rather than to see it as a series of dehumanized data points to be solved comes from the affirmative nature of improv, the humanizing influence of humor in the classroom, and a framework for thinking that undermines traditional hierarchies, specifically object-oriented ontology (OOO) and transcendental materialism (both schools of thought within speculative realism).

The classic improv phrase "Yes, and . . ." summarizes improv's tendency to lubricate and build up rather than hone by removal. This affirmative quality, used famously by the Stanford

d.school in its experiential education programs and described by Robert Poynton in his book *Do Improvise*, does not eliminate difficulty but has students “engage with it instead of struggling *against* it” (d.school 2020; Poynton 2014). Improv also comes along with expectations of humor and flexibility. Humor, an underappreciated pedagogical tool, changes the stakes of the conversation, humanizes all participants, and builds trust—the most influential factor impacting team effectiveness (Google n.d.).

Simply put, laughter shared can draw groups together. This is especially true in classrooms where there is much that separates, where diversity is the norm, or where the subjects studied confront students with depressing facts. (hooks 2010)

Speculative realist theories that decenter human ways of being provide a means to practice decentering whiteness. It is easier for most of us to understand that we experience the world differently than a cat or a snowstorm than it is for us to understand the magnitude of the experiential difference between ourselves and another human being. Asking students to adopt the identity of a nonhuman entity lowers the stakes in asking a very difficult set of questions: What is it like to be this other entity? How is it different from what it’s like to be me? And what does that tell me about how to go about my design work? At a time when many human beings are still treated as less than such, pretending to be animals and objects can help students understand that there are huge experiential differences to detect in their understanding of others that are often obscured by assumption, stereotype, and systemic structures like racism that prevent us from seeing one another clearly.

Timothy Morton’s theory of hyperobjects (2013) has accompanied this exercise in the past, helping students conceive of how nonhuman entities like climate change constitute our reality in ways that are as important as the ways humans do. James J. Gibson (1986) has also offered students a way to de-label the environment and evaluate it for its relational capacities rather than only filtering through what it offers to humans. In future iterations of this exercise, Ian Bogost’s *Alien Phenomenology* (2012) could provide an OOO viewpoint on complexity, humility, and a relationship between a notion of messiness in the world of things and the way ideas heap upon one another in improv. Offering another model for flattening prevailing ontological hierarchies, Jane Bennett’s explanation of the concept of vital materiality to both things and humans in *Vibrant Matter* (2010, 112) “draws human attention sideways” and might provide a more tangible, proximate framework for undergraduate design students practicing novel forms of undermining hierarchy both from an ecological and a racial perspective.

Using this improv- and speculative realism–informed technique, a productive failure showed me that this exercise had the potential to uncover blind spots produced by general stereotypes and by most students’ belonging to the dominant culture. A certain student, assigned the role of a newspaper, had carefully constructed a narrative in advance of visiting Kingsessing, wherein the ubiquitous newspaper gets bought, read, cast aside, and then goes for a jolly ride on public transportation, an adventure all its own. But when the student visited the neighborhood to document the experience of the brave little newspaper, there was little evidence that newspapers circulated as expected in this neighborhood at all. Frustrated, the student returned to the studio empty-handed. Rather than dismissing the student for bringing nothing to class that day, however, we were able to have a studio-wide discussion about how the expectations about newspapers were coming from stereotypes about

media use not informed by open observation of the neighborhood itself. The student eventually returned with a set of short transcribed interviews that document brief conversations with Kingsessing residents about the ways that newspapers really do (or don't) operate in the neighborhood. The work took an important first step: open listening.

3. INTEGRATING OBLIQUE STRATEGIES INTO DESIGN FUNDAMENTALS AND FUTURE WORK

Over the course of two years, this exercise changed what the students ultimately proposed in the final project for the semester: a micro thesis in which each student pitched a system, process, or structure that amplifies, undermines, or articulates conditions of gentrification found in Kingsessing. Many iterations are necessary to confirm the effects I claim this exercise has in undergraduate architecture studios, but the shift from recognizable charity-service products to a more diverse set of empathetic social justice design responses is legible in the chart below that catalogs the students' final project topics from 2017 (before I fully implemented the Party Guest analysis exercise) to 2018 (Figure 3).

Student proposals 2017-2018	
BEFORE PARTY GUEST (2017)	AFTER PARTY GUEST (2018)
Transit hub + park	Space for listening
Community college	Community forum / food hub
Market / cafe	Speculative fiction examining the power of monuments
Biophilic factory	Zoning code revision
Holistic wellness center	Phytoremediation farm
Transit hub + market	XR social hub
Modular development system	Art gallery / artist studios
Neighborhood museum	
Child care + study center	

Figure 3: Catalog of final project proposal topics in Betwixt and Between studio, 2017–18

I continue to incorporate these improvisational values and abilities, recently adapting “Party Guest” into site analysis drawing exercises in a design fundamentals studio I coordinate at the sophomore level at the School of Architecture and Urban Planning at the University of Wisconsin–Milwaukee (Figures 4 and 5), where the students are not grappling directly with gentrification. Here, I am beginning to see evidence of this exercise’s tendency to apply student abilities to set aside traditional hierarchies (the primacy of human perspective, for instance) in order to meaningfully discover something about another entity’s point of view that was previously invisible to them. Benjamin Zerrien, a student in the Spring 2020 sophomore studio, said this about the difference between drawing from his own perspective and then switching to the Sun’s (Figure 4):

Composing the first drawing required me to prioritize which aspects of the site I wanted to explore. The resulting composition reinforced these hierarchies in my mind. These hierarchies, which were established from a human point of view, were

subverted by the second drawing, which required a nonhuman perspective. One “aha” moment for me was realizing that the sun doesn’t see shadows. This realization led me to think more critically about what the sun does experience.

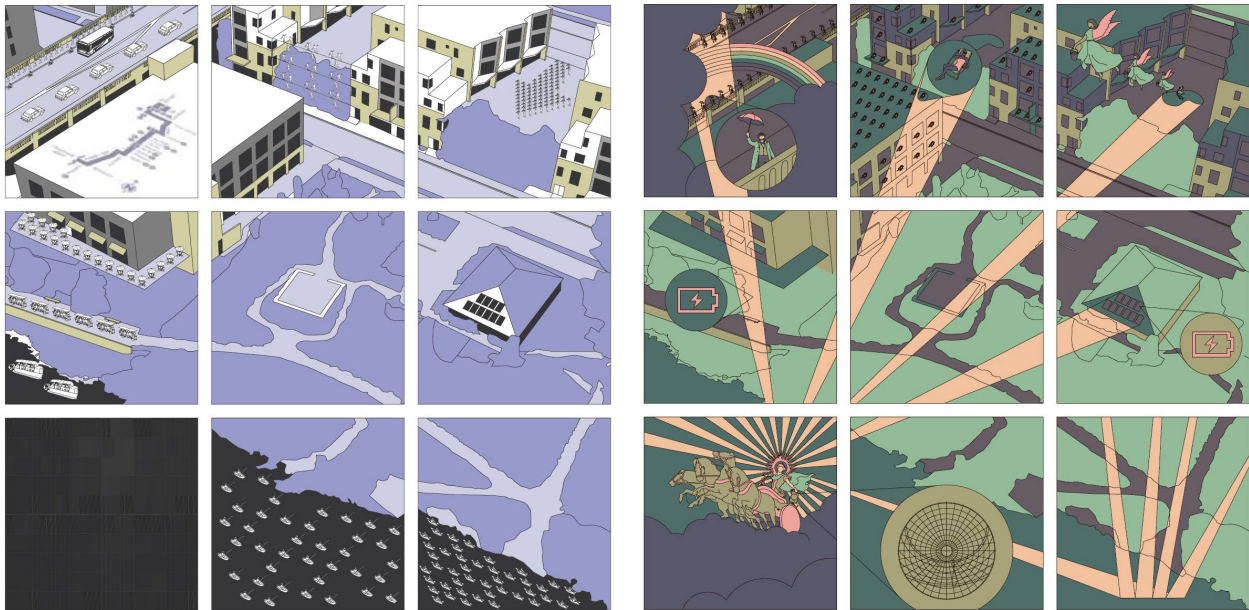


Figure 4: Point-of-view drawings: Human POV (left); Sun POV (right) (by Benjamin Zerrien, 2020)

Although there is still a lot of work to do to make explicit connections between my students and social justice design practice, my claim is that their exposure to improv-based analytical exercises that explore nonhuman points of view can reveal blind spots caused by belonging to the dominant culture, increase openness to others, and loosen fixed mindsets about the nature of architectural deliverables (especially for upper-level students). These oblique pedagogical strategies also seem to produce projects rooted more in process development, relationship building, and empathetic listening to design *with* community than in traditional, product-based approaches to solving perceived problems *for* populations who are disadvantaged by systemic forces like racism in which architecture is complicit. It will be important as this work evolves to constantly evaluate the ways that the oblique strategies themselves might become acceptable code for what Barbara Applebaum calls “white calming techniques that provide absolution from guilt” (2017, 865). Consistent curiosity in this area must be cultivated, especially as the essential work to dismantle white cultural dominance transforms all parts of life, presenting ample temptation for white people to seek the comforts of low-stress environments it has long been our privilege alone to enjoy.

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