

Title: Safe Agua: A Collaboration between *Un Techo Para mi País* and Art Center College of Design

Themes: Sustainability & Social Innovation

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Authors: Penny Herscovitch, Dan Gottlieb, Liliana Becerra, Mariana Amatullo, and David MocarSKI.

Abstract

This panel discussion brings together the lead creative team of Safe Agua, a social innovation collaboration between Designmatters at Art Center College of Design and Chilean NGO *Un Techo Para mi País* (Un Techo). This unique combination of design education, design research, and social entrepreneurship aims to help families in Chile's campamentos (slums) break the cycle of poverty by developing new products and systems of storing, utilizing, transporting, and conserving water. Un Techo is run by university students and young professionals dedicated to eradicating poverty throughout Latin America via social inclusion processes and housing solutions. The partnership between its Innovation Center and Designmatters, Art Center's social impact department, provided a multidisciplinary team of faculty and students the opportunity to conduct field research with families living in Santiago's campamentos. Art Center students then designed innovative solutions at a range of scales—from product to system, to community spaces to campaign—to address specific water-related needs identified through that research. Six prototypes are currently in various stages of testing, in preparation for real world implementation. Projects such as Safe Agua are changing design education by integrating dynamic social entrepreneurship and community activism to realize a more sustainable future.

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Introduction

In both their pursuit and execution, projects such as Safe Agua reveal the future of design education in a brilliant new light.

Led by the Department of Environmental Design under the aegis of Designmatters, Art Center's social impact department,ⁱ Safe Agua brought together students from five majors (Environmental Design, Product Design, Graphic Design, Transportation Design, and Graduate Broadcast Cinema)ⁱⁱ under three faculty members: Penny Herscovitch and Dan Gottlieb (Environmental Design), and Liliana Becerra (Product Design).

The result of a Designmatters partnership initiated in 2008 with the nonprofit group *Un Techo Para Chile* and its umbrella organization, *Un Techo Para mi País* (Un Techo), Safe Agua addresses the quotidian challenges of safe water access for the families of Campamento San José, one of the transitional slum developments on the outskirts of Santiago, Chile. Felipe Berrios, a Jesuit priest who also happens to be a social entrepreneur, founded Un Techo, which translates as "A Roof for my Country," in 1997. Berrios set about to improve conditions of poverty in Chile's slum communities with a sustainable and inclusive model for housing and development that has produced outstanding results in addressing systemic poverty by flattening social barriers and discarding an "us versus them" view of the world. Embracing the motto, "Youth building a Latin America without poverty," the best and brightest university students were mobilized to volunteer and meet the needs of slum residents by building transitional housing as the first stage of a comprehensive program integrating a series of long-term skill development services focusing on empowering individuals, families, and communities to take charge of their own future. Today, Un Techo serves 15 countries throughout Latin America, recruiting young professionals and university volunteers to assist over 200 million people living in extreme poverty.ⁱⁱⁱ

Un Techo's model is fundamentally not about parachuting handouts of aid, but connecting often divided sectors of society, and ultimately building the commitment necessary for a more humane and prosperous outlook for all. As first articulated by Berrios, this mission is aligned with prevailing views in sustainable development best practices, which argue for proactive and co-participatory creative problem-solving models across boundaries to tackle environmental and social challenges. It is a transformative agenda for collaborative social change that also resonates with contemporary organizational learning theories, including that of MIT scientist Peter Senge: *"The vast changes required for creating a regenerative society...will require inspiration, aspiration, imagination, patience, perseverance, and no small amount of humility. They will require networks of committed people and organizations who not only learn how to see systems shaping how things work now, but also create alternatives."*^{iv}

The Safe Agua collaboration is a key exemplar of the national and international alliances brokered by Designmatters that enrich the educational curricula with meaningful outside engagement in order to promote cross-pollination of expertise, new forms of knowledge, and an immersive and experiential learning process that allows students to develop tangible, "real-world" outcomes.^v The project also reflects a socially ambitious approach

to contemporary pedagogy that is redefining the role of artists and designers as potent catalysts for social innovation. With a critical shift toward ethical design gaining momentum, projects such as Safe Agua demonstrate how design schools have the unique opportunity to become vital laboratories for best practices in human-centered research and creative engagement, and play a critical role in shaping a more equitable society.^{vi}

As the ensuing sections of this paper attest, the extensive field research undertaken at the inception of the project was a paramount in gaining a richer understanding of the project's challenges and opportunities. This immersion allowed the students to gain experience with the community and make personal emotional connections that proved instrumental not only in their understanding of the depth of their creative process, but also in their ability to integrate design, business, and culture factors into their proposals. Both the research methodologies and initial outcomes of the project, as presented herein, clearly stand at the opposite spectrum from utopian, "blue sky" and style-driven design briefs. In seeking opportunities to improve the quality of these families' lives through design, the rigor and constraints of the field research and the multilayered community interactions together stand out as a foundational stepping-stone for the Safe Agua student teams.

Design Challenge

Safe Agua is a unique combination of design education, design research, and social entrepreneurship. Such projects are changing design education and the design process itself to integrate field research as the driving component. Beyond responding to a preconceived design brief, students now are learning how to identify design opportunities and evaluate their largest potential impacts.

Our team of teachers, students, and nonprofit partners integrated multiple professional backgrounds and design disciplines. This new model deeply connects people across cultures and forges alliances across borders.

Our design challenge began by asking the question: How can we work with impoverished communities (campamentos)^{vii} in Santiago to develop new tools for using, storing, and transporting water in order to help families overcome the conditions of poverty?

"We are designing real, actionable solutions to help improve the daily lives of people living in the campamentos. This is a serious challenge to create real social change. Social entrepreneurship is not about charity, it is about reaching out to others, addressing real problems in their lives, and empowering them to bring about the change they desire." — Jacqueline Black, Product Design student

The Context: Water in Campamento San José, Santiago, Chile

Globally, 1.1 billion people^{viii} do not have access to safe, clean water for drinking and daily use. The challenge in Campamento San José is not the absolute lack of water, but rather the physical and mental burden of living without running water. It is easy for people who have running water to take it for granted. We bend water to flow through our

lives — it appears at the turn of a knob and disappears down the drain. In the campamentos, people bend their lives to accommodate the realities of water.^{ixx}

Families in Campamento San José receive water from a municipal truck one to three times per week. They live with the uncertainty of whether or not the water truck will arrive. When the water is delivered, they store it in barrels outside their homes.^{xi} Without running water, women must hand carry water for each daily task. Bathing becomes an arduous chore rather than a relief; laundry can take a full day of physical labor; and a glass of water can make a child sick. These perpetual burdens consume people's time, diminish their quality of life, impact health and dignity, and become an obstacle to earning a stable income and overcoming poverty.

“In many countries, the water problem is the primary reason people are unable to rise out of poverty. When used properly, nothing drives growth and eliminates poverty more effectively than water.” — Blue Planet Run^{xii}

Field Research

In order to understand and gain insight into another culture and ultimately identify design opportunities to help families overcome the conditions of poverty, we established different strategies and methodologies to gain empathy and to guide the students throughout the research phase.

Exercise in Empathy: A Day Without Taps



We believe that at the root of all design is empathy. Therefore, one of our initial goals in the research process was seeking to understand people whose lives differ in many ways from our own. Establishing personal connections between students and families shifted our process from designing *for* people to designing *with* people.

For many of us, this was the first time we visited families of lower socioeconomic status, and likewise our first experience living without running water. One of the things we take for granted is convenient, unlimited water from plumbing and faucets, yet the communities we worked with in the slums of Santiago only have water delivered (as infrequently as once a week) by truck.

To better understand this limitation, we conducted an empathy exercise called “A Day Without Taps.” The Designmatters team in California and our partners from Un Techo, in Chile, participated in this exercise together, helping us bond as a group and setting the tone for a truly collaborative project.

In order to experience the challenges that families living in the slums face on a regular basis, each student and instructor lived for a day using only five gallons of water, taken either from our nearest hose or from a previously filled five-gallon (19-liter) container — the average amount of water that a family in Africa consumes each day.^{xiii} We committed ourselves to use that limited water for all our daily activities (bathe, brush our teeth, cook, wash, drink, flush toilet, etc.).

We each kept a detailed visual journal of our Day Without Taps, documenting with photos, sketches, reflections, and questions. We noted how many liters of water we used for each activity, and whenever possible we consulted our water bill to compare how much we otherwise use on average. We often found ourselves changing our behaviors to cope with the challenge: skipping showers, postponing laundry, and coming up with different solutions to carry, store, and filter water.

Once we arrived in the slums of Santiago, we realized that as useful as this exercise in empathy was, our experience of a Day Without Taps was nothing compared to the challenges people in the campamentos had to confront every day.



Research Methodology Cards

In order to prepare ourselves for the field research, we created a tool kit of methodology cards specifically targeting our project objectives. We drew input and inspiration from different design research sources and methodologies, including IDEO’s method cards and their Human Centered Design (HCD) tool kit,^{xiv} and also from our own professional background and experience in the field of design research and insights.^{xv}

The tool kit was fundamental for directing the focus of the field research. It provided our students with the confidence and structure to navigate a completely new territory. It also changed the traditional model of design education by introducing field research as a key

component of the design process.

The set of six cards defined the outline of the research. Each card featured one research topic and posed its fundamental questions with an inspiring image on the front and our recommended tips and strategies for gaining the relevant insights on the back. The cards were pocket size, with waterproof surfaces, to enable students to carry them out in the field as a guideline. We included a blank section on the back of the cards corresponding to the date, so students could decide and mark the order in which they would organize their research.



Broad Research Topics

Rather than focusing only on the functional problems of storing, carrying, using, and re-using water, we also decided to assess the “big picture” aspects of the problem.

Understanding things such as people's core values, aspirations, physical environments, and daily life gave us further insight into the problem, and ultimately engaged our team on a personal level with our partners in the slums.

The three broad research areas we considered were:

1. Aspirations & Limitations

What are people's aspirations, and what keeps people from achieving them? How can we best impact this area?

ASPIRATIONS / LIMITATIONS METHODOLOGIES

Personal Inventory (Emotional):

Document the things that people identify as important to them as a way of cataloging evidence of their lifestyles. (30 min)

Collage or Card Sorting:

Ask participants to build a collage from a provided collection of images and to explain the meaning of the images and arrangements they choose. (30-45 min)

Draw your Past / Future:

Ask participants to "draw the future you want" (if they won the lottery or otherwise had no limitations). Draw a path from the past to now to that future, with the steps and hurdles along the way. (30min)

EXTRA TIPS

- > First, gain people's trust.
- > Gather direct, unfiltered quotes.
- > Plan deep interview questions and practice interview techniques.
- > Ask "why" five times, to get to the real "why."
- > Prepare and print visual cards ahead of time.

2. Materiality & Spaces

What is the material reality of personal and collective objects in the household and neighborhood? How can we best impact this area?

MATERIALITY / SPACE METHODOLOGIES

Behavioral Archaeology:

Look for evidence of people's activities, habits, and values inherent in the placement, wear patterns, and organization of things.

Social Networks & Spaces:

Notice different kinds of social relationships within a user group and map the network of their interactions. In what ways do objects, materials, and spaces express social relationships?

Personal Inventory (Functional):

Ask people to show and describe objects they handle daily — catalogue evidence of lifestyle. (30 min)

EXTRA TIPS

- > How do things wear out?
- > What can we learn from resourcefulness of the material culture?
- > Be aware of materials and spaces throughout Santiago, not just in the slums.

3. A Day in the Life

Catalogue a day in the life of people in the campamentos, with special attention to the role water plays. How can we best impact this area?

DAY IN THE LIFE METHODOLOGIES

A Day in the Life of a Family:

Catalogue the activities and contexts that water users experience throughout a day.

Shadowing:

Tag along with people to observe and understand their day-to-day routines, interactions and contexts. (1-2 hours)

Timeline:

Create a branching timeline of household members' activities. Every person in the household plays a different role. How do the roles of different people relate to each other?

EXTRA TIPS

> Each team member can shadow a different household member.

Focused Research Topics:

To focus on more specific functional, water-related issues that would directly target our project objectives and deliverables, we created the following three research topics:

1. Storing / Containing

How do people store, contain, and protect valuables, food, water, and everyday objects? How can we best impact this area?

STORING / CONTAINING METHODOLOGIES

Error Analysis:

List all the things that can go wrong when storing/containing water and determine the various possible causes. (30 min)

Scenario Testing / "What If":

After your initial research, show users a series of cards depicting possible future scenarios for storing water and invite them to share their reactions. (30 min)

Guided Tour:

Ask participants if you can accompany them on a guided tour of how they contain objects. Why did they choose a specific means of storage? (45 min)

EXTRA TIPS

- > Be aware of cultural biases and preconceptions.
- > Consider differences between storing valuables versus daily objects.
- > How does the house itself serve as a container to keep out rain, store water, etc.?
- > Survey containment solutions that exist on the market and that families have invented.

2. Carrying & Moving

How do people carry objects, water, and themselves around? How can we best impact this area?

CARRYING/MOVING METHODOLOGIES

Behavioral Mapping:

Track the positions and movements of people within a space over time and note what are they carrying or moving around while doing it. (45 min)

Flow Analysis:

Represent the flow of water through all phases of use. Consider water's behavior, not only on a map or plan, but also as it moves up and down.

Fly on the Wall:

In public spaces, such as markets, neighborhoods, or public transit, observe and record behavior within its context, without interfering with people's activities. (1–2 hr)

EXTRA TIPS

- > What do people carry around (wallet, phone, children, jewelry, etc.), and why?
- > Take “what’s in my bag” photos.
- > Survey carrying solutions that exist on the market and that families have invented.

3. Use & Reuse of Water

How is water used over the course of a day and week? What objects have been reused for a function or task different than its original purpose? How can we best impact this area?

USING / REUSING WATER METHODOLOGIES

Storyboard of Water's Day / Week:

Illustrate a character-rich storyline describing the context of water use. Water is the main character; if water could tell its story, what would it say?

Camera Journal:

Distribute a kit with camera, journal, and instructions. Ask participants to keep a diary of activities related to using water. (15 min / 1–2 days)

Narration:

As they perform a task or process, ask participants to describe aloud what they are thinking — to reach users' perceptions, concerns, and motivations. (45 min)

EXTRA TIPS

- > Other documentation methods: Script photos — ask people to re-enact each step of a process; time-lapse video.
- > Ask the family what’s missing?
- > What objects have been re-used for a function or task different than its original purpose?
- > Be sensitive to private activities (i.e. shower).
- > Buy cameras ahead of time.

In the Field



“It was quickly clear to me that my research trip wasn’t just about acquiring raw data, quotes, and statistics. My research was to listen to stories, study faces, sympathize with difficulty, and share in excitement.” — Stephanie Stalker, Environmental Design student

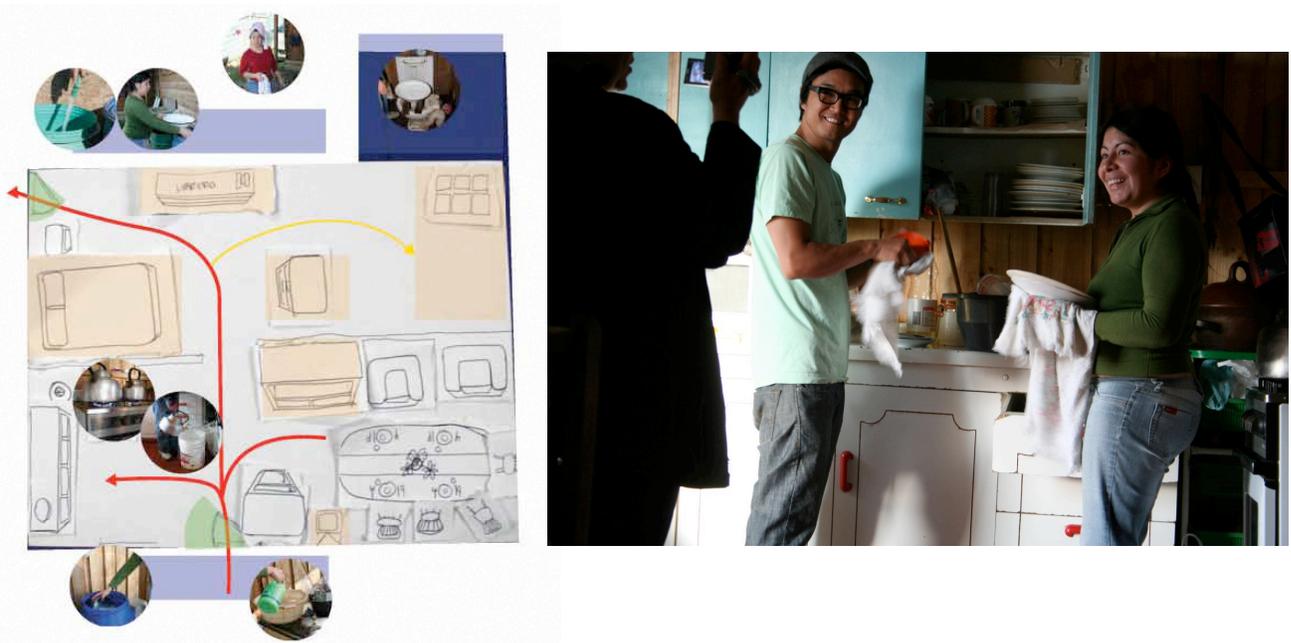
Once in the field, our team spent two weeks of intensive research in Santiago, Chile, with families living in campamentos (slums). During the process, students developed and personalized the guided methodologies, making them their own. This included:



Creating card-sorting exercises to identify aspirations.



Students Diane and Ramon look at the documentation of the research finding they have just created while taking a break in the field. Throughout the entire process, students documented their research findings and created people's profiles and floor plans with flows of water and daily activities.



Students Stephanie, KC, and Nubia created a paper space-planning tool. Maria used this kit to design her ideal configuration for her media agua.

Participating in — rather than only observing — daily activities of the families: doing laundry by hand, helping clean the house, and cooking meals.

Design Process

What made the Safe Agua design process unique? The class proceeded like any other Transdisciplinary Studio (TDS) at Art Center,^{xvi} but with four significant distinctions: first, driven by field research, student designers became opportunity seekers; second, collaboration was essential to the process; third, the studio embraced the ingenuity and resourcefulness embodied by Un Techo's *Minimo* philosophy; and finally, the resulting projects are designed to be rapidly implemented in the real-world campamento context.

Driven by Field Research: From Problem Solvers to Opportunity Seekers

During our research trip, each methodology card asked “How can we best impact this area?” Upon returning to Art Center from Chile, this question became the driving force for the design process. After compiling the field research, we clustered the gained insights into areas of focus, ranging from long-term well-being (health, employment, education, and emotion), to daily water-related tasks and functions (optimizing containing, transporting, and using water for time efficiency and physical convenience).

Unlike many studio classes, in which an instructor or partner company might assign a project brief that defines the problem to tackle for the term, each Safe Agua team embarked on a process to define the problem for themselves based on their observations during field research. This alters the conventional responsibility of the design student to now engage in the process of evaluating *which* (of the dauntingly many) problems to tackle, and then deciding *what* to design.

“What is *the* problem?” probed visiting faculty Adlai Wertman and Abby Fifer Mandell from the Society and Business Lab at USC’s Marshall School of Business.^{xvii} While the constellation of daily and long-term challenges that people in the campamentos face seemed daunting, intertwined, and complex to us, Adlai’s provocation challenged each team to focus on a very specific problem that could be tackled in the remaining 10 weeks.

At one point during this process of problem definition, Environmental Design student Stephanie Stalker asked, “Rather than identifying potential problems to solve, couldn’t we identify opportunities?” Although it might seem a simple question of semantics, Stephanie’s question shifted our view of the problem-solution paradigm toward a much more optimistic perspective: we may have begun by calling ourselves *problem solvers*, but in fact we would come to define ourselves as *opportunity seekers*.

Collaboration: Designing “With” not “For”

“Modern environments and experiences cut across all boundaries of geography and ethnicity, of class and nationality, of religion and ideology: in this sense, modernity can be said to unite all mankind. . . . A struggle to make ourselves at home in a constantly changing world. . . [that] implies an open and expansive way of understanding culture.” — Marshall Berman^{xviii}

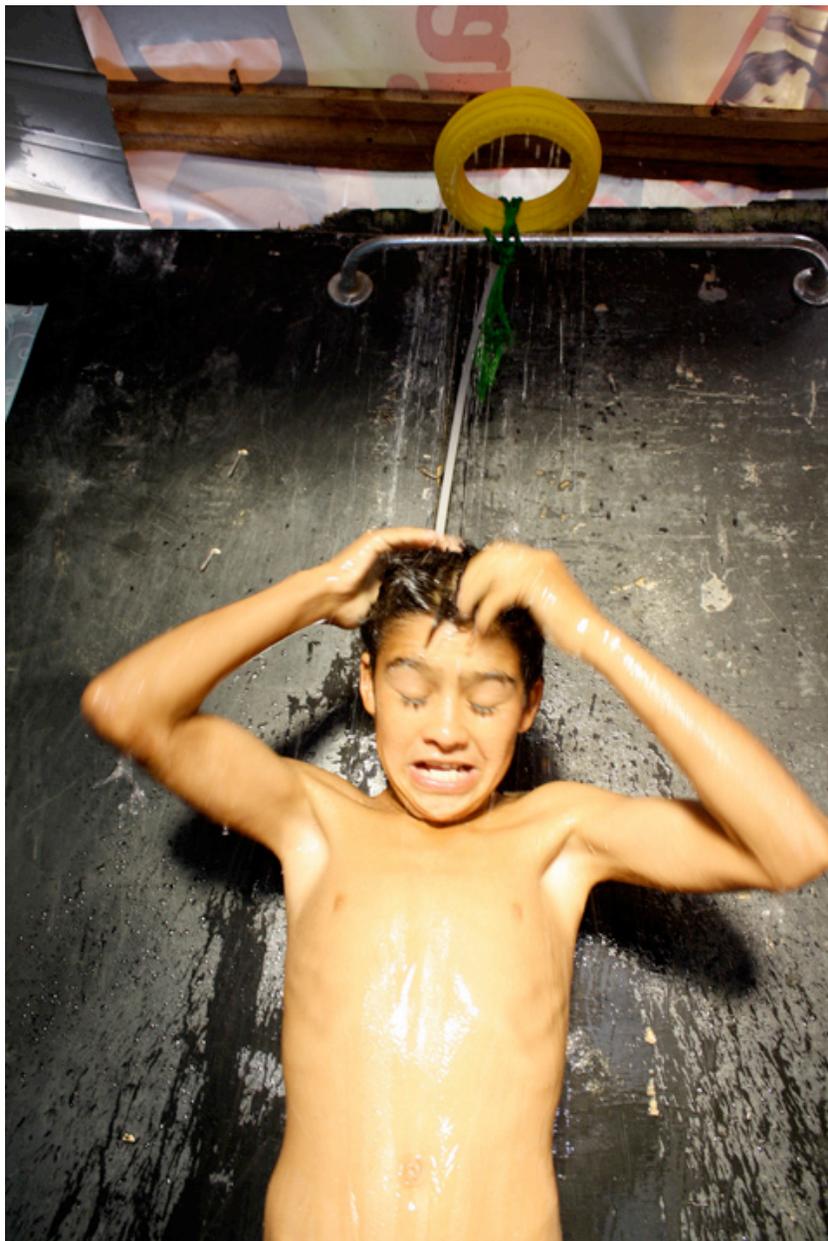
Early in the term, Dirk-Mario Boltz, visiting professor from the Berlin School of Economics, framed Safe Agua in terms of the larger “co-creation” trend. Co-creation, simply put, is designing *with* people, not *for* them. The first step is empathy — moving past a mindset of “us” and “them” to a mindset of “we” — and developing what C.K. Prahalad describes as “a new respect for consumers as co-creators of solutions and not just passive recipients of a product or service.”^{xix}

Our ongoing relationship with the campamento families and our NGO partner, Un Techo, drove the project. At heart, the Safe Agua design process embraced collaboration — an engagement between people of different disciplines, perspectives, and histories.

In Product Design student KC Cho’s words, “No statistic or data replaces direct contact

and feedback from the families. Once we were able to connect with the families, they gave us everything we needed to start the project.”

In practice, bridging the divide of location, culture, and language presented challenges. Yet students stayed directly connected to the families by several means, including email and Skype. Families from the campamento participated in a focus group organized by Un Techo to share their specific feedback on each project. This dialogue between students and families extended to co-testing: as Jessie and Narbeh tested their *Ducha Halo* shower prototype in Pasadena, families were testing it in the campamento. Since the campamento families could not come to Pasadena for the final presentation, our team sent the families a five-foot long banner showing the entire final presentation, a symbolic exchange that extended the personal relationships established during the project.



Minimo: Maximum Impact for Minimal Resources

“Minimo” stands for maximum impact for minimal resources; this is the philosophy of Un Techo’s Innovation Center. Minimo also encompasses the extraordinary resourcefulness and ingenuity that people living in the campamentos have developed out of necessity. The Safe Agua studio adopted the minimo ethos — that design innovation can be driven by a radically low budget. Prahlhad, again, cites not just the poor’s participation in local problem solving, but also in worldwide economic growth: “Four billion poor can be the engine of the next round of global trade and prosperity. They can be a source of innovations....in technology, products and services, and business models,” and result in “sustainable win-win scenarios where the poor are actively engaged and, at the same time, the companies providing products and services to them are profitable.”^{xx}

In practice, this approach influenced every aspect of the studio, from process to presentation to final prototypes. For midterm, teams employed an iterative process of making working mock-ups “Frankensteined” together from off-the-shelf parts (rather than more polished looking but non-functional models). This iterative process of making full scale, working mock-ups continued through to the final, to yield final prototypes intended for real-world implementation.

Real-World Design for the Campamento Context

The context of the campamento was paramount, and communicating the context in which each design was intended became part of the challenge. A particularly inventive student team played a Spanish soap opera on high volume during their research presentation to help the guests understand what it was like inside the homes of many of the campamento families. For midterm and final presentations, the simple rule of “no display pedestals” pushed teams to display their proposals within a context that communicated the feeling of the campamento to the whole school; and teams displayed their projects in the gallery amidst decidedly un-gallery-like wooden slat structures. One cannot remove these projects from their context; they simply do not make sense against a glowing white backdrop, as they are for, by, and of the campamento.

Part of our collective responsibility as a class was to bring the minimo ethos, and our connections with the families of the campamentos, back to Art Center to share with the school and beyond. This is precisely what this paper endeavors to do: connect the reader with the people in the campamentos, the challenges they face, the bigger picture of global water and poverty challenges, the class process, and solutions proposed by Safe Agua teams.



Outcome: Six Interconnected Projects

The six transdisciplinary teams designed innovative solutions at a range of scales — from product to system, to community spaces, to campaign — that addressed specific water-related needs identified through their field research. They coordinated how each proposal would complement the others, producing an outcome in which the whole is greater than the sum of its parts.

Julian Ugarte, director of Un Techo's Innovation Center, envisioned the metaphor of the class as a human body. *Gota a Gota* is the heart of Safe Agua — a gravity-fed system that allows water to flow to all parts of the home. *Agua Segura*, a family-sized kit for water chlorination and filtration, fulfills the physical need to drink safe, pure water. Two projects fulfill the need to be clean: *Ducha Halo* brings the dignity and well-being of a hot shower to people living with no running water, and *ReLava* is an inexpensive kitchen workstation that makes washing dishes in the home sanitary and efficient, and facilitates the reuse of water. The *Mila* community laundry and *lindex* catalog of shared innovations address people's need to communicate and share social support.

Although each project specifically targeted water-related challenges, the entire class worked toward a holistic goal: to make an impact on the lives of families in the campamentos. The projects that emerged are interconnected in a pragmatic sense, in that they collectively fit into the home, to make incremental improvements in the quality of daily life. More broadly, they fit into the longer trajectory of a person's life, and seek to help make the transition from people's current temporary living situation in the campamento toward a better life for their families (with the assistance of Un Techo) in permanent social housing.

Safe Agua provides a case study in a new and necessary approach to the critical importance of empathy-driven methodologies in design education for social impact, and documents the unfolding evolution of design and design education. Considered in isolation, Safe Agua makes a powerful case for specific, direct impacts through a human-centered, collaborative approach to problem solving. Viewed as an example for the execution of socially driven design principles, however, it demonstrates the far-reaching potential for these research methodologies, collaborative processes, and creative solutions to achieve further relevant successes globally. As a template for action, Safe Agua evinces the role of designers as potential change agents for people living in poverty, or otherwise suffering from seemingly intractable problems that have yet to be addressed by the power of design.

ⁱ Designmatters was founded in 2001, inspired in part by a school-wide survey in which Art Center students expressed keen interest in pursuing international educational opportunities and socially relevant projects as part of their coursework. A volunteer task force of staff, faculty, and students worked with cofounder Mariana Amatullo to articulate the original Designmatters mission, establish guidelines for the program to function, and initiate both internal and external contacts to scout for projects and fundraising opportunities. For a comprehensive archive of Designmatters projects and publications, see <http://www.artcenter.edu/designmatters>.

ⁱⁱ The Safe Agua team of students comprised Elizabeth Bayne (Graduate Film); Jackie Black (Product Design); KC Cho (Product Design); Ramon Coronado (Graphic Design); Narbeh Dereghishian (Product Design); Stella Hernandez (Environmental Design); Erica Li (Environmental Design); Nubia Mercado (Transportation Design); Stephanie Stalker (Environmental Design); Will Tang (Product Design); Diane Wei (Product Design); and Jessica Yeh (Environmental Design).

ⁱⁱⁱ The authors are indebted to the commitment, expertise, inspiration, and generosity of Padre Felipe Berrios; Rafael Achondo, Director of Development, *Un Techo Para mi País*; and Un Techo's outstanding Innovation Center team: Director and Founder, Julián Ugarte, Andrés Iriondo, and Askan Straume. For more information about *Un Techo Para mi País*, see www.untechoparamipais.org.

^{iv} Senge, P., Smith, B., Krushwitz, N., Laur, J., & Schley, S. (2008). *The necessary revolution: Working together to create a sustainable world*. New York: The Crown Publishing Group.

^v Art Center students and faculty participate in interdisciplinary studios, elective courses, independent study, special projects, and international internships that focus on the social responsibility of design and business practices. The outcomes and wide visibility of many of the Designmatters projects implemented to date derive from the strength of the educational collaborations that the initiative has brokered. These partnerships focus on four pillars of investigation — human sustainable development, global healthcare, public policy, and social entrepreneurship — and expose students to a meaningful range of

expertise and experience. In 2003, the United Nations Department of Public Information designated Art Center an NGO (non-governmental organization) in recognition of Designmatters' service to society. Other unique affiliations now include civil organization status with the Organization of American States, and another NGO designation by the United Nations Population Fund (UNFPA).

^{vi} For an excellent anthology of the current debates and discussions about what it means to teach art and design in the 21st century, see Buckley, B., & Conomos, J. (Eds.). (2009). *Rethinking the contemporary art school: the artist, the Ph.D., and the academy*. Halifax: The Press of Nova Scotia College of Art and Design.

^{vii} "Campamento" (literally translated as "camp" or "encampment") is the Chilean Spanish word for a slum, including the transitional communities served by *Un Techo Para Chile*. UN-HABITAT defines a slum household as a group of individuals living under the same roof in an urban area who lack one or more of the following: access to improved water; access to improved sanitation; security of tenure; durability of housing; or sufficient living area. In 2010, according to UN-HABITAT, 110.7 million people in Latin America and the Caribbean live in slums, also referred to as *favelas*, *villas miseria*, or *asentamientos*.

^{viii} Estimate for 2002, by the WHO/UNICEF JMP, 2004.

^{ix} For an in-depth discussion of the water crisis and the historical context of the eras of water that the world has experienced, refer to: Gleick, P. H. (2009). Facing down the hydro-crisis. *World Policy Journal*, 26(4), 17-23. Peter H. Gleick is co-founder and president of the Pacific Institute in Oakland, California. A MacArthur fellow and member of the U.S. National Academy of Sciences, he is the author of seven books, including the biennial report, *The World's Water* (Island Press).

^x For a primer on global water issues, refer to: A special report on water. (May 2010) *The Economist*. Retrieved from:
http://www.economist.com/specialreports/displaystory.cfm?story_id=16136302

^{xi} The 20 families of Campamento Fundo San José live in media aguas — which literally translates to "shacks" — transitional homes constructed by *Un Techo Para Chile* volunteers. These prefabricated wooden structures house a family of four in 18.3 m² of interior space (6.1 m x 3 m) — smaller than a typical parking space.

^{xii} For a rich collection of photographs, figures and stories about the global water crisis, refer to Blue Planet Run: Smolan, Rick, Jennifer Erwit, and Robert Redford. *Smolan, R., Erwit, J., & Redford, R. (2007). Blue Planet Run: The race to provide safe drinking water to the world*. San Rafael, CA: Earth Aware Editions. http://www.amazon.com/Blue-Planet-Run-Provide-Drinking/dp/160109017X/ref=cm_taf_title_featured?ie=UTF8&tag=tellafriend-20.

^{xiii} water.org. <http://water.org/> (26 May 2010).

^{xiv} Patrice Martin, Practice Lead and systems designer at IDEO, notes that Method Cards were originally developed "to represent the diverse ways design teams can better

understand the people they are designing for.” IDEO also provides the HCD Toolkit, which is specially adapted for NGOs and social enterprises working with low-income communities in Africa, Asia, and Latin America. It is designed to help understand people's needs in new ways, find innovative solutions to meet these needs, and deliver solutions in a financially sustainable way. The resource is free and available to download at www.hcdtoolkit.com.

^{xv} IDEO’s Design for Social Impact workbook and toolkit for the Rockefeller Foundation is another valuable resource, which is free and available to download at: <http://www.ideo.com/work/item/design-for-social-impact-workbook-and-toolkit/>.

^{xvi} Project-based learning is a key element of Art Center’s educational philosophy. Working in real-life settings tests and enhances proficiency in fundamental skills and exposes students to a wide range of disciplines. Because businesses increasingly require artists and designers from discrete disciplines to work in collaboration, Art Center’s Transdisciplinary Studio (TDS) workshops combine upper-term students from different majors on projects requiring several areas of specialization. By working across traditional boundaries, students achieve fluency in multiple design settings and applications.

^{xvii} Adlai Wertman (Founding Director, Society and Business Lab, Marshall School of Business, University of Southern California) and Abby Fifer Mandell (Director of Education, Society and Business Lab, Marshall School of Business, University of Southern California) are ongoing collaborators in Designmatters TDS projects. Their expertise and perspective adds fundamental value to design studios that focus on design for social impact. For further information about the innovative work done by the Society and Business Lab, refer to <http://www.marshall.usc.edu/sbl/>.

^{xviii} Berman, M. (1988). *All that is solid melts into air: The experience of modernity* (Second ed.). New York: Penguin.

^{xix} Prahalad, C. K. (2009). *The fortune at the bottom of the pyramid: Eradicating poverty through profits* (Revised and Updated Fifth Anniversary ed., p. 15). Upper Saddle River, NJ: Wharton School Publishing.

^{xx} Prahalad, C. K. (2009). *The fortune at the bottom of the pyramid: Eradicating poverty through profits* (Revised and Updated Fifth Anniversary ed., pp. 15, 27-28). Upper Saddle River, NJ: Wharton School Publishing.