



# Design Education Can Change the World

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## Insights

- An enduring technology-design curriculum needs to focus on the verbs, not the nouns, of the practice.
- A full-bodied compassionate approach to education—hands, head, and heart—can support students to find their expressive courage and agency.
- When designing an educational program, understanding the greater social context and developing intended student outcomes can make it have a more significant impact.

It's a beautiful day in September 2016, the first day of our new senior Interaction Design Thesis class in San Francisco. An intense discussion moves around the room, each student sharing their aspirations for the year. Our whiteboard shows two overlapping circles labeled "What's important to you?" and "What's important to the world?" with the intersection, labeled "thesis."

"I have learned so much here," says a soft-spoken young man named Sergio Burgos. "I'd like to give back by doing something for my home country, Peru."

When Sergio starts his thesis research on Peru that week, he

discovers countrywide protests on violence against women. Drawing on inquiry lessons from his Design Research course, he asks for stories on Snapchat, and in under two weeks has gathered more than 300 stories from women, and a few men, about their experience with violence. Sergio quickly prototypes a site offering advice and support, and reaches out to a Peruvian politician he met through his research. Together they discover the greater need is a site to aggregate all the existing information services.

Two years later, Sergio is a full-time designer at LinkedIn, and also working with Peruvian feminist leaders to

secure funding for the site with plans to launch at scale in 2019. For Sergio, the project represents a powerful opportunity to transform the lives of the more than 700,000 Peruvian women annually who report domestic violence. That a thesis project could have such meaningful intention is a testament to the power of today's technology and a student's heartfelt, creative ambition. I believe every interaction designer can create social impact if they are taught to ask not just *what* and *how* they design, but *why*.

## THE POWER OF A SOCIALLY ENGAGED ART COLLEGE

In 2010, Mark Breitenberg, then provost of California College of the Arts (CCA), alongside president Steve Beale, commissioned me to establish an innovative interaction design curriculum. The intention was to reinvent the century-old institution with deeper technological relevance and to position the college as a leader in this new field. In this article, I'll reflect on the journey we took creating the programs and accomplishing the transition. I'll focus on the challenges and share some lessons that I hope can be applied elsewhere.

We knew we wanted to create something different—a potent combination of our small, socially engaged San Francisco art college and the technological design culture of Silicon Valley. CCA was already known for excellent craft and for curricular engagement with the local community, making it seem natural to offer students an experience combining the best of art-college training with the teaching potential of local professional designers. For students, the major would enable rewarding and potentially lucrative careers while also fulfilling the college's mission of creating positive social change through the arts.

Not many programs get to start from scratch, but this greenfield approach gave me the latitude to work as a human-centered startup inside the college. In doing so, I stepped away from a decade-long career as a digital innovation and business leader at IDEO to begin my new career as an “educational intrapreneur.”

***A design process to create a design curriculum.*** While developing the curricular vision, I quickly learned that most successful interaction designers followed idiosyncratic paths. There was no obvious curriculum to emulate, and no singular faculty or designer who could simply reteach what they had learned. Design historian Barry Katz reminded me that the Bauhaus created the contemporary discipline of design by bringing together an ensemble faculty that united formal elements of art with practical hands-on craft. Our aim, too, became bringing together a diverse specialist faculty to create something larger and newer than the sum of its parts—but first, we had to better define the discipline and the curriculum.

I convened several sessions with dozens of leaders from the corporate, academic, and nonprofit worlds to strategically map out the most challenging problems of today, the most significant problems of tomorrow, who the most successful designers were, and what industry would need from the next generation of interaction designers. These sessions included leaders from Apple, Google, IDEO, Stanford, Berkeley, CCA, and beyond. Some were group sessions, others one-on-one to understand their paths and perspectives. My curricular goal was to combine creative, technology-shaping practices from film, animation, graphic design, industrial design, HCI, and architecture, while also identifying and defining new

skills not yet taught in any of those programs.

Within six months, we'd produced our program goals, learning objectives, and the core principles of our curriculum for what was, in 2011, one of the world's first undergraduate interaction design programs. We structured the program around four elements: *context*, *curriculum*, *classroom*, and *culture*. In 2015 we used a similar process to establish the Master of Interaction Design program, learning from the successes of the BFA program, with a goal of craft-shifting studio-based designers, and a few engineers, from legacy disciplines into interaction design (Table 1).

## CONTEXT: GOOD DESIGN STARTS WITH INTENTION

*Always design a thing by considering it in its next larger context.* —Eliel Saarinen

A curriculum is derived from an understanding of context, and from setting the intention for real-world impact. Many of us were drawn to design or HCI because we foresaw the increasingly profound impact of technology on people's lives, yet the acceleration of change seems to have taken even us by surprise. Today technology increasingly shapes our experience of the world, including how we communicate, govern, learn, travel, trade, and manage vital parts of our lives.

The implications of decisions made by engineers, technologists, and designers are all around us at an unprecedented scale. At Facebook alone, design decisions made by the interaction team will be experienced by more than 2 billion users every month. Given this critical intersection of technology and impact, it has never been more important that designers understand their power and both their intended and unintended potential consequences.

In his book *Grunch of Giants* (1983), Buckminster Fuller wrote that real transformation comes not from political innovation but rather from technological innovation. That is because political change is too slow and is often only a response to disruptive technological change, which implied to me that the capacity to humanize technology is primary. And there is increasing urgency not

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only in the issues we need to address but also in the speed with which technology is impacting society.

The industry faces increasingly complex ethical challenges in its decision making, whether over the use of personal data and machine learning, the implementation of self-driving vehicles, or the consequences of businesses built around the attention economy that, we now know, impact both our family relationships and even our democracies [1]. Advancing into the next decade with so-called exponential platforms such as robotics, machine learning, virtual reality, and blockchain will open up vast new business opportunities, displace millions of jobs, affect culture, and ultimately change policy.

Many engineering schools, including MIT and Stanford, are still debating whether technology education needs to accommodate ethical concerns [2]. But a new program at a social-justice college doesn't have this historical burden. It seemed clear to us to ask: Just as architects help ensure the safety of buildings, shouldn't interaction designers today help ensure the safety of technologies?

## CURRICULUM: DESIGNING FROM SCRATCH

After defining our intention to humanize technology, we just needed a working definition for the discipline. In 2010 we could not find a formal definition of interaction design that could help us create the curriculum, and there were only a few exemplary studio-based interaction design programs in existence. Thus we created our own definition from the research we did on successful designers: *Interaction design is a new human-centered collaborative design discipline with deep skills in systems and behavior, with just enough technical skills to demonstrate and just enough visual skills to communicate.*

This definition helped to distinctively map out our new curriculum. We are not graphic designers but need some of those skills to communicate. We are not engineers, but we need enough coding knowledge to prototype and demonstrate. Our deeper skills are design for technical and social systems, and for human and machine

IXD MASTERS OF DESIGN				
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SPRING	Systems IXDGR-640	Prototyping IXDGR-630	Social Change Lab I IXDGR-710	Elective
SUMMER	Story IXDGR-650	Experience IXDGR-660	Social Change Lab II IXDGR-720	Leadership by Design IXDGR-616

Table 1. The IxD master's curriculum focuses on what is not taught in traditional design disciplines.

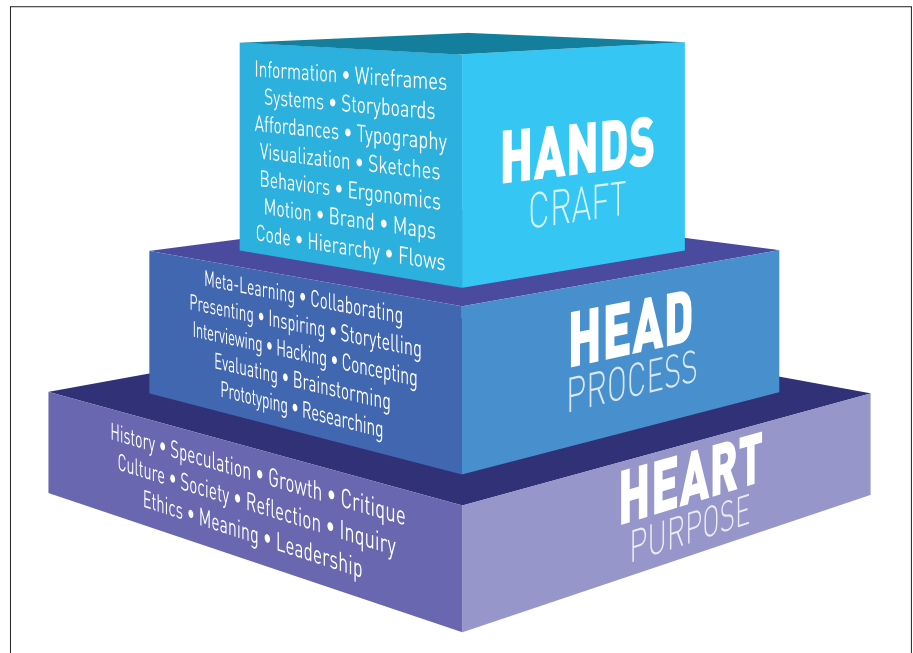


Figure 1. The whole body learning curriculum framework. Each group of learning objectives is supported by what's below.

behavior. No other traditional design discipline laid claim to that, and the definition has served us well.

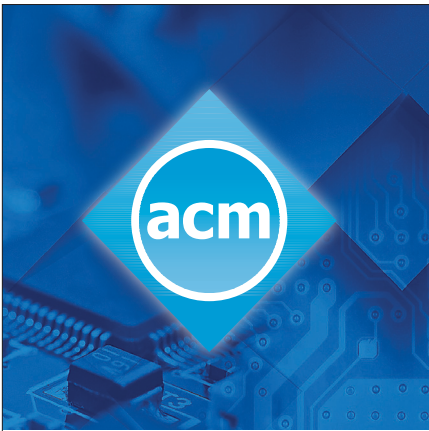
"Technology changes too fast," Bill Moggridge, IDEO cofounder and my mentor, once told me. "You need to educate students in the stuff that changes slowly—those things that are fundamentally human. Verbs, not nouns."

We built Moggridge's advice into the program's learning objectives, focusing on the timeless, human-grounded verbs that underpin good interaction design such as prototyping, researching, collaborating, systems thinking, and storytelling, with a deeper understanding of core human capacities (such as those from cognitive science). Further, a recognition that technology design tools and techniques are in perpetual evolution brought focus to developing our students' individual growth-oriented process and craft skills, such as meta-learning, reflection, creative hacking, and inquiry, thus

helping enable a student's ability to continually approach and integrate new tools and techniques (see Figure 1 for a more extensive list).

It is important to question what is. Victor Papanek's 1973 book *Design for the Real World* advised readers not to accept the status quo: "Design, if it is to be ecologically responsible and socially responsive, must be revolutionary and radical." Two generations later, with exponential technologies, democracy under threat, and climate change threatening life across the globe, the need to increase capacity through education feels even greater.

Design is about deliberate change, often of systems; a capacity to reflect is critical. In his classic 1989 book *Educating the Reflective Practitioner*, MIT's Donald Schön encouraged reflective learning as a way of helping students deepen their inquiry. "The reflective practitioner allows himself to experience surprise, puzzlement, or confusion in a situation which he finds uncertain or unique," Schön wrote.



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Figure 2. Students creatively shaping technology in the Hybrid Lab.

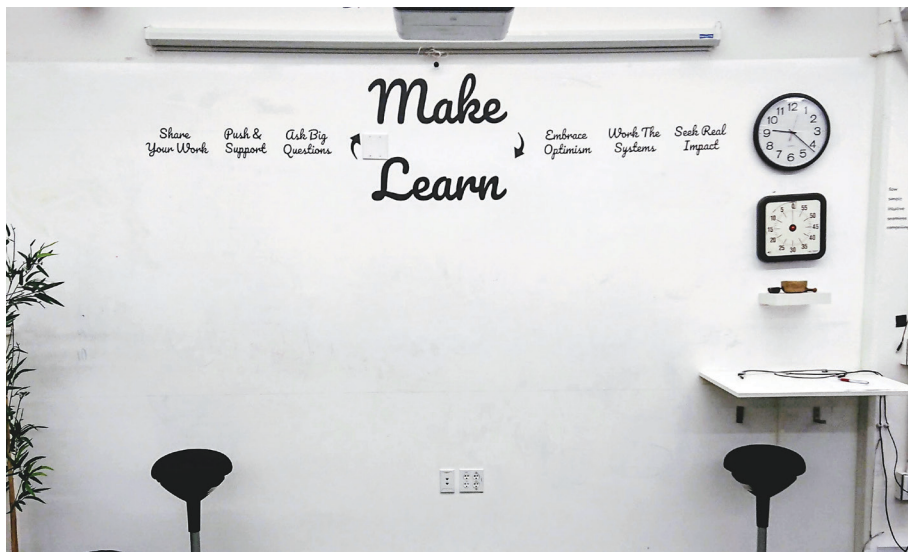


Figure 3. Whiteboard at the front of the design studio with the cultural values in applied laser-cut vinyl.

Reflection helps us handle ambiguity and see connections. It also helps to keep us from accepting the power limitations granted by those who commission our work.

Beyond the research findings and advice, the curriculum is heavily influenced by my own path in design leadership—a humanist technical education rooted in Scandinavian cooperative design [3]—and my full-bodied design explorations pioneered at IDEO [4]. Combined together with the hard-craft-based foundation of art college, where students spend nearly all their time working with their hands, I call this *whole body learning*, which consists of three parts: hands,

head, and heart (Figure 1).

**Faculty follows curriculum.** In the fall of 1984, I was an engineering freshman at Columbia in NYC. My physics class was led by a well-known physicist from the Eastern Bloc who would read aloud from a textbook in his impenetrably thick accent, deriving equations for two hours on nine blackboards, chalk splintering under his heavy hand. I gathered 80 signatures from students who agreed the course did not meet our expectations for one of the best universities in the world. The dean's response: "He is a Nobel laureate nominee and needs to teach a course to fulfill his teaching requirement."

Having worked in it, I now know that academia moves slowly and often has a longer-term mission. But while I understand, I never wanted to subject my students to that kind of experience. The most inspiring teachers are those with not just the experience, credibility, and energy to engage their students but also the compassion to inspire and support them.

With curriculum in hand, I just needed to find the right people with both a vibrant professional practice and a growth mindset to bring the curriculum to life—teachers who were up for taking a shared learning journey with their students. Fortunately, many of the designers defining interaction design today live within a few miles of our CCA campus in San Francisco. Through close connections to industry, our program has been able to attract and hire more than 75 design leaders as adjunct faculty since the program began in 2011, many of them with experience at Google, Facebook, Apple, IDEO, Frog, and smaller agencies and startups.

Art college as a making-based education is inherently constructivist, and nearly all courses are project based. While most potential teachers had decades of studio-based practice and industrial workshop experience, few had formal teaching experience, and in many ways, that was a better fit for our model. Educational pioneer John Dewey's three-part experiential learning model (theory, activity, reflection) inspired how we teach our curriculum [5]. To turn an experienced workshop facilitator into an effective interaction design teacher, it often took little more than a mini-lecture on Dewey's model and a co-creation session to identify several inquiry arcs that would create a 15-week, semester-long sequence of workshops.

## CLASSROOM: HOW AND WHERE WE TEACH

At CCA, our learning and exploration take place in at least four spaces: the physical classroom, our maker's lab, the virtual workspace, and San Francisco itself.

Art colleges and design studios have always understood the importance of a rich and stimulating physical workspace. We teach in spaces that encourage flexible, uninhibited practical work, which

means movable furniture, writable walls, sticky notes, and the ever present foamcore boards for pin-ups, collaboration, and sharing. It is not uncommon to find sawdust alongside trimmed insulated wire on the studio floor.

There are few tests in art college but lots of critiques and discussion. Critical thinking is one of the most powerful, transferable disciplines of a robust art-college education. Working with a teacher, small groups of students are encouraged to talk about their own work and intentions, and explore questions and observations of other students' work. Students also receive individual attention from their teachers each week, often benefiting directly from faculty with 20 years of professional practice in class sizes of a dozen or so. Teachers can know each student and their backgrounds, aspirations, successes, and struggles.

In this way, art college is more intimate and personal than research-based universities, attracting different learning objectives from different kinds of students. Students are largely international female people of color and include significant (over 30 percent) first-generation college attendees. Nearly all report wanting to change the world for the better and favor meaning over money. My colleague Haakon Faste often refers to his goal of creating a compassionate classroom. Indeed, teaching a growth mindset and working with complex social challenges often require individualized student support from skillful teachers in a small group setting.

In our Social Change Lab course, with the theory that nearly all the world's important challenges can be found within a mile of campus, we use the vibrant and often challenging city of San Francisco as the classroom and design domain. In this form of service learning, students see homelessness and mental health problems firsthand. Responses include 2016's Project Dahlia, in which three female graduate students researched, prototyped, and delivered monthly hygiene kits to women on the street and then partnered with a nonprofit to design and distribute these at scale.

*Workshop: What is the material of interaction design?* Each discipline in an art college has traditionally

## HCI AND IxD— DISCIPLINE SIBLINGS

Human-computer interaction (HCI) and interaction design (IxD) might seem similar in practice, but they are expressed and taught in different ways. HCI programs have typically developed out of computer science departments, with a worldview that often assumes computers are central to the solution. IxD has grown out of industrial and graphic design programs, positioning human interactions as central to design practice and therefore holding digital expression more lightly.

One IxD project during my time at IDEO exemplifies this process. In 2002, Kaiser asked us to help design the UI for nurse knowledge exchange as part of its \$10 billion effort to digitize medical records—something that was intended to set a pattern for a broader rollout. After studying the nurses' work patterns over several days, we observed that critical information was lost as nurses and crews changed shifts, and that other information was often held by family members outside the official system.

Our solution was based not on the screen UI but rather in the redesign of the workflow and context. We prototyped staggered shifts so that nurses' knowledge overlapped more effectively, put whiteboards in patients' rooms so that families could share in the handover process, and gave nurses knowledge-capture booklets to more effectively share information when their shifts changed.

The broader rollout, instead of being an interaction pattern language, was the design and creation of the Garfield Innovation Center, an off-campus mock hospital near the Oakland headquarters built to explore and institutionalize patient-centered innovation practices throughout the Kaiser system, including a new digital innovation team.

These broader and arguably more appropriate analog responses can be developed if designers 1) are confident enough to look to the greater context, 2) see processes such as nurse-shift schedules as within their design scope, and 3) are trained in enough making-based design to create sufficiently professional analog prototypes.

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Figure 4. Danielle Forward, Sheryl Sandberg, and Annita Lucchesi at a Natives Rising gathering organized by Forward.

had its own physical workshop—a place of physical tools and making. Accordingly, we were invited to build one for our program. We knew it would not be a computer lab. Defining the workshop forced a definition of the “workable material” for interaction design. After some deliberation, we defined our material to be technology, which made the workshop focus “to enable the creative workability of technology in a similar way that a ceramicist uses clay” (Figure 2).

We met this need by creating the Hybrid Lab. The lab offers generous operating hours and has large, welcoming doors and bright lights that invite students in. Curated shelves of projects, drawers of electronic parts, 3D printers, soldering stations, and helpful student assistants create an atmosphere of experimentation and exploration. The project brought together faculty from all four college divisions: architecture, fine arts, humanities and science, and design. Enthusiastic support from the president and board of trustees gave us the resources and funding to expand

the lab into a college-wide effort available to all students.

The lab is devoted to interdisciplinary, collaborative curricular and extracurricular experimentation using agile technologies like Arduino. Design students create interactive environments; fashion students make wearables; fine arts students create fire-breathing robots; architects make walking buildings. It was a significant achievement to establish the practical and conceptual importance of interaction design in our college and unify multiple disciplines around the creative potential of technology.

## CULTURE: SEVEN VALUES THAT DEFINE

The culture of our program is strongly influenced by every new intake of students and the natural annual turnover of faculty. While we are heavily influenced by the design-thinking movement, we also feel the need to push further beyond that label and delve into design craft.

Over the years we developed and

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posted a collaborative manifesto of our shared values that provides focus, inspiration, and momentum for the playing, learning, and working we do together (Figure 3):

- *Iteratively make and learn.*

Designers are makers and learners. Great designers find ways to iteratively ask the right design questions, and they iteratively respond toward the right designs.

- *Share your work.* Our practice is fundamentally collaborative. We openly share our work, seek and value integrity for our designs and others, and are confident about our contribution.

- *Push and support.* As designers, we must take risks if we are to make an impact. We are coaches to one another, pushing and supporting each other to do our best work.

- *Ask big questions.* We question the status quo and we aim high. Our questions expose opportunities for which we can be inspired and challenged to reach our collective potential.

- *Embrace optimism.* Technology is a tool, and it takes humans to guide progress. We seek bravery, hope, and connection. We inspire each other toward making the world better.

- *Work the systems.* Everything is connected. By exploring systems, we design for positive impact while minimizing harmful outcomes. When the status quo does not support our work, we seek and celebrate creative hacks.

- *Seek real impact.* We must reality test with real people. We ask the world what is most important; we show the world our design responses; and we learn, measure, and improve.

## HANDS, HEAD, AND HEART: TOWARD A MODEL OF SOCIAL CHANGE

By designing the curriculum around a holistic approach of the hands, head, and heart, we are able to connect our practical teaching approach with our aspirational theory of social change. To effect change from within the industry, we want to give our students three things: 1) the handcraft skills to earn a seat at the table of the most impactful organizations in the world, 2) the leadership skills to develop a

voice at that table, and 3) social impact skills, gained through work with the community, to bring compassion and heart to the table. If we do this right, we will increase the number of human-centered-technology-shaping designers and leaders who will increasingly help frame social challenges as design and business problems.

Annually we receive 250 international graduate applications for a few dozen spaces, and we have celebrated more than 140 graduates of our bachelor's and master's programs. Our graduates now work at Google, Amazon, Facebook, Airbnb, Adobe, the United Nations, nonprofits, and many other companies across the technology industry, where their knowledge and compassion will be the foundation of their professional practice for the next 40-plus years.

In 2017, design research by our BFA student Danielle Forward revealed that only a small fraction of Native Americans graduate college with a four-year degree. A northern California Pomo Native American herself, Danielle developed the site Natives Rising to support Native Americans in the tech industry through mentorships and by celebrating their achievements. In September 2018, her first mentee made a connection through Natives Rising and started work at Pandora. Now a product designer at Facebook [6], Danielle organized an internal Native American design group and brought activist Annita Lucchesi to speak on campus in November 2018. After attending as a guest, Facebook COO Sheryl Sandberg lent her support to Lucchesi's campaign highlighting the epidemic of missing Native American women across the U.S. (Figure 4).

Danielle's story illustrates the kind of positive social impact we want to achieve with interaction design education. Our students graduate with expressive courage and compassion along with the skills and understanding of the full design process. It's an education of the hands, head, and heart. And a combination that I believe can help change the world.

## ACKNOWLEDGMENTS

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## ENDNOTES

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