# Crafting Quality in Design: Integrity, Creativity, and Public Sensibility

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## ABSTRACT
This paper aims to enrich the design research community's notions of quality by turning to the techniques and values of master craftspeople. We describe and analyze interviews conducted with elite craft practitioners in the US and Taiwan to consider how they perceive and produce quality. The crafters articulate a consensus view of interaction with integrity. American participants tend to frame their understanding of quality in terms of self-expression through a creative interaction with materials, while participants from Taiwan emphasize the role of communities in establishing—and benefitting from—craft quality. As HCI continues to turn to design approaches on account of their strengths producing works of socio-cultural relevance and value, our study sheds light on the qualities of interacting with integrity, the pleasures of self-expression through creative interaction with materials, and the practical benefits of positioning creative work in relation to the material resources, aesthetic tastes, and socio-economic needs of a public.

### Author Keywords
Craft, interaction, aesthetics, everyday life, social impact.

### ACM Classification Keywords
H5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous.

### General Terms
Design, Human Factors.

## INTRODUCTION
Design qualities are, perhaps counterintuitively, hard to grasp. A professional designer often has much more to say about the design qualities of, say, a coffee grinder or a typeface, than a non-designer does. Members of a comparatively new design field, with quickly changing materials to work with, interaction designers today seek to design for qualities that we are struggling to understand or even recognize—even when they are right there in front of our eyes. Because there is no normative good to design to, designers must exercise good judgment, which is constituted by such things as "imaginative capacity, penetrating insight, good memory, poetic disposition, [and] good taste" [33]. Such capacities are cultivated in part by means of a professional design community's sustained critical engagement with cultural exemplars, including their materials, effects, symbolic meanings, social reception, and cultural situatedness.

To investigate questions of quality, we turned to master crafters, people for whom a concern for quality is primary. We draw from two sets of interviews, one in California, USA, and the other in Caotun, Taiwan to examine how and why notions of quality are put into play. Inspired by research on craft [e.g., 12,25,28,31], we believe that research on the expert sensibilities of master crafters can contribute to designers' ability to perceive, understand, and create quality in interaction design. Specifically, craft is widely recognized as a pleasurable form of interaction, connected in meaningful ways to self-expression, livelihoods and leisure, creativity and innovation, heritage, and sustainability—all major themes in recent interaction design research.

Indeed, craft research has already influenced interaction design. A recent study of restoration bookbinding [30], for example, suggests technologies might be designed to sustain specific forms of authenticity and value much like leather and cords. Craft concerns are also shown to merge with networked information systems, enabling a range of symbolic investments. These include strengthening social bonds [17,37], sharing expertise and feedback [36], and inspiring new creative outcomes [29]. The quality of "well crafted" is clearly applicable to interaction design, and it should include a holistic sensitivity to material, social, functional, and aesthetic qualities.

Issues of quality are also not new to interaction design. Since the late 1980s the socio-cultural agenda of design research has expanded and reframed our approaches to evaluating design. Rather than limit our gaze to usability, we turn to understandings of usefulness [13]; no longer constraining our work to verification and validation, we accommodate diverse assessments of confidence and relevance [7]; and beyond statistical measurements, designs undergo critique [38]. Design research also seeks to explore qualities of good design from different perspectives, e.g., [2,3,4,11] in ways that are meaningful to people [20]. This


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amounts to a sophisticated form of subjective expertise [13] that comprises creativity, reasoning, communication skills, as well as ethical and aesthetic sensibilities [0,23]. Yet what the assessment criteria entails and how such criteria are reached continues to complicate the project of design.

The contribution of this paper is to inform how we approach the evaluation of interaction designs by turning to the critical sensibilities of master craftspeople and explicating their understandings of quality. In particular, we turn to the double meaning of the term: quality as *attribute*, wherein distinct features become recognizable through practice; and a more holistic notion quality as *craftsmanship*, wherein a community's shared notions of quality are developed, appreciated, and refined. As we will argue, the two notions are not distinct and separable such that the former (attributes) are embedded in the latter (craftsmanship). Rather, we find that the two understandings of quality are mutually constituted as an ongoing social accomplishment. We then delineate three strategies of framing an understanding of quality with specific relevance to the design research community's broadening research agenda: *sociomaterial quality*, *creative-expressionist quality*, and *public quality.* Each framing suggests a specific form of evaluation that calls attention to features of "good" work, such as pleasure in engagement with materials, innovation, and cultural significance in everyday life. It is also grounded in a detail-rich, exemplar-heavy, and culturally specific account of craft.

## RESEARCH APPROACH

The present work offers a critical synthesis of about 30 hours of interviews with master crafters and government officials involved with craft in both the US and Taiwan. We refer to interviewees as crafters to primarily highlight how their work was perceived as part of craft traditions. Open-ended questions were intended to encourage our interviewees to discuss the dimensions of their work they felt were most important as influential leaders in San Francisco's and Caotun's craft scenes. As conversation guides we asked our interviewees to tell us about their life experience with craft. Specifically, the questions centered on four threads:

- *Background*: Education, life trajectories, cumulative craft experiences, motivation, creative processes, etc.
- *Personal craft identity*: Inspirations, tools, materials, working with fellow crafters, etc.
- *Perceptions of craft*: Characteristics of good craft, market perspectives, relationships with art and design.
- *Influence of government policy on craft*: The role policies play in the development of craft, how they impact the individual and the community, etc.

### Caotun, Taiwan

In March of 2011, two researchers from the research team conducted 10 interviews, with a total of 11 interviewees, in Caotun township in central Taiwan. Six of our eleven interviewees were inducted by the Taiwanese government into the "Taiwan Craftsman Guild," the highest honor for crafters, and awarded the title of "大師" (*i.e.,* Master); only 137 crafters have ever been given this distinction in the entire country. The 11 interviewees (3 female, 8 male, including 2 participants with doctorate degrees in craft-related fields) all reside in Caotun, Taiwan's craft hub, and were recruited initially through the recommendations of National Taiwan Craft Research and Development Institute (NTCRI). A snowball sample was subsequently developed from the original participants. Participants had the choice of remaining anonymous or supplying their identities, and all consented to identify themselves.

The interviews were all conducted in Mandarin Chinese, the official spoken language in Taiwan. Interviews took place at the master crafters' studios and the offices of the government officials. Neither interpreters nor translators were used; one researcher is a native speaker of Mandarin and the other has basic conversational competence.

### California, USA

In the summer of 2011, a third researcher from the team conducted eight interviews, with a total of 10 interviewees in San Francisco, California, US (6 women, 4 men). This included seven interviews with professional craft practitioners, recruited through local leaders in the San Francisco craft scene. Prior connections through previous research <<removed>> pointed us to well-regarded practitioners working in one or more craft genre(s): pottery, woodwork, mosaics, jewelry and metals. Our interviewees have exhibited in and been included in the permanent collections of a range of museums throughout the United States, including the Smithsonian Institute and the Museum of Fine Arts Boston. In addition to shows, their recognition in the local craft scene was sustained through ongoing teaching commitments and online activity such as blogging. Whenever possible interviews were conducted inside practitioners' workshops and included tours of their facilities (7 out of 8 interviews). Two interviews were conducted over Skype prior to an in-person meeting. Interviewees also included the director of the American Craft Council (ACC), the primary professional craft organization in the US. All interviews were recorded through digital video or a combination of digital audio and images. US participants' identities have been anonymized.

### Data Analysis

We transcribed all video and audio content, and key passages from the Chinese transcriptions were translated into English for the purpose of this paper. The data analysis was conducted through a procedure known as *explication de texte*, or close reading, an analytical method that originated in the humanities [26] and which involves the careful examination of diction, rhetorical devices, style, and other formal and thematic elements in a text. Two researchers involved in the study have doctoral training in the humanities and have used this approach in prior research <<removed>>. In the data interpretation phase, two researchers conducted their close readings independently of one another to identify an individual set of themes. Subsequently, the entire re-

search team collaborated to combine, refine, and distinguish among themes before arriving at the critical synthesis of quality, described in the ensuing sections.

## A CONSENSUS VISION OF QUALITY

Across both sets of interviewees we found some common concerns for the experiential aspects of material engagements and what distinguished "good" work in the eyes of these expert crafters. As documented in prior research [16,31], handwork involves intricate sensory adjustments that enable makers to adopt and develop specific understandings of their materials. As we will see, the ways in which participants talked about these material interactions also opened up different ways of seeing quality.

### *Quality of embodied activity*

The satisfaction of physically working with particular materials and tools was a key feature of skilled handwork. Here Penny, a Californian potter, tells us how she uses a metal wire brush to create coarse textures on the inner surface of her pots:

> *"Oh yes. I wanted to come [up] with another way of putting texture without using glaze. So I started just using the wire brush. I could hold it on the inside and brush away clay when it is leather hard, and then I can feel how close I am getting to going all the way through without going all the way through. So that gave me you know another way to make the pot thin without having to trim so much off of it."*

This technique is applied to "functional" pottery (pots with the capacity to hold water). For the pottery to remain functional, however, Penny cannot puncture the clay as she works with the surface. To ensure the impermeability of the vessel, Penny describes "feeling" her proximity to the surface as she moves her hand over the clay. While applying the wire brush, she prefers to work with hard dry clay since a wet surface does not provide the same sensitivity. Feeling, in this sense, involves not only engaging with the tool, but also understanding interactional characteristics of the clay.

### *Quality of material-driven innovation*

As craft progresses, our participants described the process of finding their way. A ceramicist describes producing a wall installation out of clay:

> *"[I]nstead of having this preconceived idea of how it's going to look on this large piece, one item… I wonder how I can change the configuration so I actually have an interesting collection of work that's related but not the same. It was a little hard for me to make ten swirl pieces and I don't want them to be all the same size and the same color and everything. I want there to be some interest. So, that's where again I sort of let my material help me to figure out how I'm going to make the piece work."*

This excerpt from our interview transcripts reveals a few important aspects of handwork practice. First, we find that Jill seems unsure how she should change the "configuration" of her work to produce a desired result. Jill does not have a "preconceived idea"; she does not have a clear vision of what lies ahead. Instead she is using the materials and tools to *think with*: deciding what she wants them to do and how. This speculative and indeterminate progression is reminiscent of what Tim Ingold [16] terms *wayfinding* in comparison to *navigation:* feeling one's way rather than using a map. We also notice how Jill appears to listen to the material. She allows her materials to "help" her and become collaborators in the production process.

Master potter Tseng Ming-nan also describes his interaction with materials in profoundly aesthetic terms:

> *"I am a strong believer that all material has its own unique quality. A good crafter recognizes that uniqueness in material, respects it, and strives to convey and represent that quality in her/his work. All my life, I have made it my primary pursuit to reveal the unique quality of my material—clay—in such a way that people can appreciate its beauty. There is an ancient Chinese idiom: "miraculous hands heavenly made" [妙手天成, meaning that one's hands are so skilled that their works seem nature-made]. That is my lifelong pursuit."*

Inverting a rather conventional hierarchy between artist and materials, Tseng, one of the most renowned and celebrated potters in Taiwan, aspires to be worthy of the clay with which he works. And if he is successful, he hopes that his public will also come to appreciate clay—not his work, but *clay itself*—as a beautiful material. His attitude and the Chinese idiom he references are self-deprecating: his aspiration is almost to disappear as an individual and instead reveal the existing natural glory of his material.

### *Quality of tradition: Craft lives and evolves*

Craft often carries connotations of tradition and even bygone eras. However, echoing recent cultural heritage research [18], our interviewees frequently stressed that craft is not a dead skill from the past to be preserved, but rather that craft participates in everyday life and evolves over time. As master lacquer crafter Huang Li-shu puts it,

> *"While most people tend to fixate on techniques when it comes to craft, techniques are after all only one aspect of craft. To me, craft is technology. As such, craft is situated in and shaped by a particular era and is embedded in that era's everyday life. It's neither practical nor desirable to use objects from bygone years because life changes into new eras."*

Matt, a Californian ceramic crafter, told us very concretely how he revisits and reimagines techniques from the past:

> *"It's not at all like thinking, well, just out of the blue: I would like to make something that looks like this. It doesn't work that way at all. It's more like: what can this technology do for you. You know, so exploring and mapping out what the salts the metals can do and then trying to figure out ways to take advantage of that rather than the other way … it's more about you know the process of the technology and what you can pull out of it."*

Like Jill, Matt recognizes that he does not anticipate what something will look like before it is made. He explores what he can "pull out" of the material and what materials "can do" for him. This process of mutually shaping the outcome reveals personal contingencies as well: figuring out what he wants his piece to become. As Matt learns to un-

derstand and "take advantage" of the salts and metals, he discovers the constraints and affordances of his "technology" as well. He identifies possibilities for manipulation and assembly, and uses the recognized potential to configure his desired result. Through manipulation, he figures out what he would like to make. When Matt attends to his materials, he is also evolving his technique.

*Quality of professional satisfaction & workmanship*

As a verb, craft signifies a way of seeing and working with materials involving integrity and respect, as Penny says, *"I don't really care if people think it's craft or art. It doesn't matter. What matters is that it has integrity."* The concept emanates an abstract "seamless" quality that is articulated clearly "*and not encumbered by bulky craft*," as Luke puts it. Through this open inscription and symbolic investment, craft both forms and performs meaningful interactions. Craftsmanship, in this sense, involves perceivability: removing the unnecessary elements of work so that only the "honest" materials and techniques remain.

Crafters in both nations exhibit a shared sociomaterial vision of quality: they discuss pleasure in engagement with materials as well as considerations for everyday cultural significance. Concerns for sociomaterial quality involve understanding the meaningful sensory relationships that develop between material arrangements and social actors.

## TWO FRAMINGS OF CRAFT QUALITY

We have so far seen how participants in both sets of interviews expressed shared concepts of embodied handwork, craft tradition and extension, and appreciation for particular qualities of "honest" workmanship. In nearly all our interviews, understandings of material engagement as creative expression emerged in parallel to sociomaterial and sociocultural concerns. However, crafters in the United States tended to frame their understanding of this process in ways that differed from the framings offered by the crafters in Taiwan. We wish to stress that 19 interviewees hardly constitute a sample of two nations' populations, so we do not mean to imply that we are speaking of American versus Taiwanese theories of craft as symptomatic of American versus Taiwanese culture; we simply seek to characterize how two groups of interviewees expressed their understandings of quality.

### California, USA: Innovation and Self-Expression

Our Californian interviewees tended to frame their craft understanding in terms of uniqueness, invention, and resistance to conformity. These concepts were expressed most clearly through their relationship to their goals as practitioners. Whether commenting on gender relations, consumerism, or the environmentalist movement, our interviewees often prompted others to "*pay attention to my message,*" as Jill said. The crafters did not aim to reproduce a cultural pastime or collective ideal; they instead reinscribed "traditional" techniques (raku, screen printing) to suit their desire for self-expression and provocation. Carving out new domains for craft practice meant taking risks, and inviting new audiences and outcomes. California crafters sought to find their own identity in their work. Jill expresses this simply:

> "*It's just it's sort of like now this is me. This is for me*," she says about her clay installations, later elaborating: *"Don't even think that it's never been made before. It's unique to you though and that's what's important is—that it's unique to you."*

*Re-inscribing formal qualities of craft*

For a piece to be unique to the crafter it must be uniquely associated with the crafter's experience of creation. Appreciation for this characteristic of interaction was highlighted in attitudes toward artistic conventions in formal training. Rather than "*go around in circles*" in his Fine Arts masters, David preferred to work as a mosaicist for Paige, engaging more directly with the surprising characteristics of physical materials (stone, glass and hand tools). De-emphasizing technique and echoing Tseng Ming-nan (quoted earlier), Jill says, "*my goal was to influence people to see clay in a different way*." This emphasis on intention exposes a theory of quality in which personal views are purposefully expressed. Henrietta and Jill emphasize the symbolism of their processes over the genre of the craft in which they were formally trained (jewelry, furniture, pottery). Such ideas of proper proportion were accompanied by self-critique, such as in Penny's description of her pottery:

> "*Well I criticize myself all the time. I criticize the forms first of all, the proportion. I criticize where I place say the wire, how does that work with the form. Texture; how does it work with that, color. My own judgment but I'm not really sure where that comes from. It's just you know when it's right; it just feels right. I'm not sure how to describe that*."

Relying on what "just feels right" was a common theme among interviewees. It was difficult to express successful interactions, but rather their expressions surfaced through continued handwork engagements. Attendance to color, texture and form revealed certain intuitive understandings of desired aesthetics. Penny is "not sure how to describe" what she sees and knows is successful but she is able to work through relationships between different properties of the material. As Paige explained:

> "*It depends on what your goal is. I don't have a holier than thou, thou shall not … This would look stupid if it was all beat up right? That would look cold, so if it wasn't, so it has to balance*."

Concerns for balance expose how participants view the substance of their goals in relation to the forms they are making. The products of handwork cannot look too geometric, nor should they appear too sloppy or unkempt. Amber tries to make her screen prints seem less "graphic" after default functions in her graphics software produce clean lines far easier than lines that appear hand-drawn. Work that demands less skill is seen as easier to accomplish and, thus, less interesting. The quality of work thus depends on the balance between efficiency and uniqueness and how sensory interactions between the crafters and their tools produce evidence of workmanship.

*Crafting Independence through Invention and Risk*

Through its performance, craft entails independence — from home life, from consumer culture, and from the hustle and bustle of the modern workday world. Distancing handwork from more typical contemporary work takes the form of physical isolation as well as expressions of creativity and artistry. In Luke's words:

> *"[B]eing able to scribe out your own time... [B]eing able to live that lifestyle. Being able to kind of choose the way that you live your life and I don't think it comes without risk."*

The ability to choose, for Luke, is key to working as a sculptor. Luke is self-employed and able to flexibly arrange how activities develop in his studio. He describes being able to go surfing when the waves are at their peak, dedicate sculptures to ending relationships, and fund his artistic practice through architectural commissions. He values the possibilities for experiencing his "own time" through deliberate choices. In his eyes the work of an crafter offers a free and precarious way of life—an element of risk missing in other professions. For some this sense of risk was achieved, at least in part, through innovative use of materials. Take Henrietta, a charismatic crafter who enjoys reusing scraps of tin, such as old lunch boxes and pop cans. She describes a tin UPC code that she applied as the clasp for a clutch, a small purse.

> *"I am a risk taker. I think that's what it is, if I have to say why do I do it. I work really hard but I am just a risk taker. I'm just really not willing to stay in safe territory. Working with recyclable materials is not safe territory and making, stepping out like this is definitely not safe."*

Henrietta's risk taking is not the final product *per s*e; she is instead interested in the labor of laminating plastic and the innovative repurposing of material. What has become unsafe is her act of leaving the collective to be alone: using unconventional materials such as the UPC code as commentary on consumerism. She sees herself as a "misfit"—someone who thinks differently about her environment and seeks to share her views with others. Each piece is intended to show and communicate something new. Alongside this interest is a fondness for the aesthetics of (re)invention.

Matt was proud of developing a glazing technique for pottery that mystified other potters. Having trained in chemistry, he and his wife Laura applied rather dangerous chemicals to produce particularly brilliant and aesthetically unique colors. The colors were invisible upon application, but appeared luminous after heat according to the shape and size of the piece. Predicting colors was therefore rather complicated and skilled endeavor, and Matt enjoyed its demand for clever problem solving. If that meant exhibiting new and innovative work, all the better. Innovation in this way was realized through careful engagements with material; it was appreciated as an emergent conditioning of success rather than a fixed outcome.

*Temporality as resistance: timelessness and transcendence*

Interviewees also expressed a sense of moving beyond. As Penny described in reference to housework: *"Like I try and keep it [the house] neat, but I can just like transcend things and it's bad sometimes."* Transcendence entails rising above that which is directly in front of the maker and her surrounding environment. If this is not accomplished in daily activity it could perhaps be invoked through handwork and skill, as Luke explains: *"For my actual definition of what fine art would be, for me it would be the art work has to kind of transcend."*

Although participants saw something appealing in reducing the time it takes to make things (or, as one said, "*making something that is being made while you're sleeping*"), when it came to purposeful production, they valued investing and transcending time. Timelessness relates to ideas of making something last: stabilizing form and interactions over time. Luke describes this succinctly:

> "*I think a lot of the digital mediums are soulless and in most cases, I would say in every case the digital medium has to be massaged somehow to make it a viable product for media.*"

Through human engagement digital products exhibit humanness and creativity. It is only "massage," or human sensory engagement, that develops successful workmanship with digital tools. The fact that digital work otherwise demonstrates a "soulless" condition suggests "viability" depends, in part, on skilled human intervention. Where quality is associated with intervention we find more emphasis on traces of work. Yet this was in tension with the sense that the digital medium cannot be inscribed by human hands. As Luke continues to explain:

> *"I don't know how much you could look at a graphic image created by a computer and hang it on your wall and be happy looking at it, whereas being made by hand has a certain kind of timeliness to it, not timeliness, timelessness to it and I don't think computer stuff can do that."*

Things made by machines or computers do not surface the same "timeless" characteristic as human-manipulated metal or wood. When erosion and decay are seen to add value, a concern for sustaining traces of interaction becomes important.

In summary, identity and materials-driven making are understood as key features of aesthetic interaction. This concern for self-expression and personal satisfaction exposes a creative-expressionist vision of quality.

**Caotun, Taiwan: A Socio-Cultural Perspective of Craft**

Taiwanese crafters also expressed considerable interest in the relationships between materials and innovation, the value of handwork, and the role(s) of audience. However, they tended to frame these concerns with more emphasis on audience and reception, as opposed to creative self-expression, than the California crafters. What the Taiwanese crafters helped us understand was that craft quality is not merely intrinsic to a well-made artifact, but is also rela-

tive to communities of appreciation. Our interviewees generally situated their work—both craft work and craft education—within an approach to cultivating a community of appreciation, especially at the regional and national levels. Developing the public's appreciation for craft raises quality of life both aesthetically and economically.

*Crafting from, in, and for a local community*

In 1993, the Taiwanese government released the "Community Craft Cultivating and Development Plan" (CCCDP) as part of a nationwide community development initiative, which seeks to support craft through activities related to the daily lives of the community with the ultimate goal of developing local micro-economies (*e.g.*, based on local, 'natural' resources and active community member participation) [22]. Our interviewees, all nationally recognized master crafters, became key to the implementation of the goals outlined in the CCCDP. With government grants and elite professional networks, these master crafters seek to contribute to the perpetuation and revitalization of regional craft, and in the process, help cultivate the appreciation of craft among community residents.

Taiwanese crafters' deep respect for local materials was a powerful theme throughout the interviews. It was not an aesthetic fetish: local materials imply local know-how, and are thus implicated in both the natural and industrial conditions of local life. Dyeing master crafters Ma Yu-xiu and Chen Jing-lin show how local materials, local skills, craft aesthetics, and social good are all interlinked. The couple conducted annual 2-4-month ethnographic studies of ethnic minority tribes in the Yunnan and Guizhou provinces of China throughout the 1990s. Observing traditional weaving, dyeing practices, and embroidery techniques, Ma and Chen cultivated their appreciation of natural dyeing—that is, using what's available in the environment, often from plants and minerals—as an alternative source of fabric dyeing. When they returned to Taiwan, they embarked on a lifelong project they described as "*the search for the colors of Taiwan*"—identifying and cataloging native plants of Taiwan and their dyeing properties [7]. Their work reverberated nationally, helping shaped the revival of dyeing craft and the awareness of natural dyeing in the country.

Another interviewee, lacquer master Huang Li-shu, also described a decade-long process of coming to understand a local material: bamboo, used extensively in her work today:

> *"My knowledge of bamboo came from living in Chu-Shan [in central Taiwan] 20 years ago…. Every weekend, I went deep into the mountains in Chu-Shan where my students and their families lived and ran around and played in the mountains with them. These mountains were known for bamboos in the country, and I learned a lot about them from my students by observing how they distinguish different varieties and how they interacted with every part of bamboo in their daily lives… there is a cyclical and mutually dependent relationships between bamboo and people of Chu-Shan… At that time there were many bamboo export companies in the region that employed local residents. I would spend days weeks and months on end visiting and apprenticing at those companies to learn from the locals how to craft with bamboos, such as weaving and tying knots."*

Ma, Chen, and Huang all offer examples of crafters' commitment to local materials, a commitment that is situated within an awareness of community needs. For decades master ceramic crafter Tseng Ming-nan has offered a rigorous and competitive 5-year curriculum involving children from the local community where they learn about the chemistry of clay, creative techniques, and kiln-making. In his words:

> *"The only way to perpetuate craft and cultivate local cultures and craft talents is to work closely with the communities. I've done it since the 60s with tangible success… we need to instill craft knowledge and appreciation to our youngsters when they are young… the objective of my 5-year ceramic training is not necessarily to teach our children how to make a living through ceramic craft. I am more interested in helping them develop a lifelong interest and expertise in ceramic craft, one that will stay with them for the rest of their lives and betters their mind and body…"*

Tseng understands that the qualities in his ceramic works do not speak for themselves; it takes a community to perceive and appreciate them. Creating a strong craft community entails both creating quality crafts and creating a community that can recognize and benefit from quality crafts.

Dye masters Ma and Chen tell another story in which a commitment to local materials led to creative innovations with tangible economic benefits to a local community. Sinpu, a township in northern Taiwan, has suffered because imported fruit and changing lifestyles have drastically cut demand for persimmons, which grow in the region and had been an economic mainstay of local farmers. Working with community leaders and local farmers, Masters Ma and Chen taught residents how to extract persimmon juice and reuse discarded persimmon skins for fabric dyeing. Since 2005, their curriculum not only has helped farmers stimulate new demand for their persimmons, but it has also been credited for the success of local cultural and economic revitalization in Sinpu [6]. Craft is also used as a means of local community solidarity in Taiwan. In 1999, an earthquake in Taiwan literally sheared off the sides of mountains of Nan-Tou, scarring the landscape for miles and causing severe economic damage. In those difficult days, crafters like Masters Ma and Chen rallied around the community, not only creating works to commemorate what happened, but also to teach suddenly unemployed and impoverished citizens how to craft—and earn a new kind of living.

These narratives help us understand how quality craftwork is embodied in strategies to leverage local resources for aesthetic and economic value creation. It is important not to overlook a key implication in this: craft quality is characterized by our Taiwanese interviewees as a culturally and locally contingent ideal; we saw little evidence of a totalizing or universal theory of craft.

*Craft as a national heritage: Preservation vs. innovation*

Craft is not only a local phenomenon. At the national scale, Taiwanese craft is simultaneously considered a national heritage, resource, and problem. Master potter Lin Gua-long indicates how this presents practical challenges:

> "*If you make it too Taiwanese, it may not have a market, because few understand or know what Taiwanese culture is... It's important for crafters to remain sensitive to modern lifestyles and fashion trends… the future of craft in Taiwan is about carving out a market and managing it like a business*."

Interviewee Ling Jeng-yi, Director of NTCRI, concurs:

> "*The survival of Taiwanese craft depends on branding, promotion, and business strategies… at stakes are our cultural tradition… the past needs to be able to speak to, remain relevant to, the present…Taiwan needs to emulate the Japanese, which increasingly positions craft as a form of design*."

The success of craft thus involves finding an appropriate balance between cultural authenticity and global market demand. Interviewees responded differently to the dilemma of being culturally authentic and commercially viable. In contrast to Master Lin's emphasis on commercial viability, dyeing craft Masters Ma and Chen prioritize cultural authenticity, saying that Taiwanese crafters need to "*search from within, to return to our roots as it is the only way to withstand the impacts of globalization and preserve our craft tradition*." Master potter Bai Mu-chuan likewise emphasizes cultural authenticity, telling us "*what a crafter makes has to reflect her/his national identity… I cannot make something that is not distinctively Chinese because that is not who I am.*" Master Bai's position is embodied in his work, which is culturally Chinese in his choice of colors, lines, shapes, forms, and the facial structures of the figurines, etc. Master Bai also finds inspiration in the everyday life of rural Taiwan, and he often uses common Chinese verbal idioms as organizing themes for specific groupings of pieces or scenes. Thus, these master crafters preserve and propagate cultural authenticity through their work, constructing a *Taiwanese* craft expertise that links their cultural ties with China with more local cultural practices.

The interviewees agreed that Taiwan is witnessing a reevaluation of craft, a reevaluation that is making room for craft as a legitimate mode of production and a legitimate consumer good qualitatively different from both industrialized design and capital-A "Art." The government, through the work of NTCRI among others, encourages people to think about craft as a form of *design*, in the sense of understanding markets and consumer demand, rather than a form of *art*, which emphasizes authenticity of self-expression more independently of the marketplace. Conflicted responses to this in our interviews suggest that it is unclear whether this reevaluation is merely a repositioning of craft in the modern world or an abandonment of traditional craft in favor of a new formulation in which craft is subsumed within design.

The policy of aligning craft with design has a complex relationship to the injunction to reposition craft in the global marketplace. The long-term and deeply personal commitment to materials that is the hallmark of craft often leads to notions of craft as self-expression, a position that makes it akin to Romantic notions of art. Yet when globally distributed to countries that lack a sensibility for Taiwanese craft traditions, crafters' unique voice or local perspective sometimes is sometimes misread as "third world," several of our interviewees noted. The dilemma between ideas of authenticity and commercial viability is also a challenge for the California craft interviewees; however, whereas this problem was framed as an individual dilemma among California crafters, it is seen as a national problem (with, by implication, a national solution) in Taiwan. The characteristics of authenticity are thus seen as critical to the quality of craft; quality is linked to characteristics of cultural and national identity, commerce and demand, and globalization.

*Cultivating a national aesthetic sensibility for craft*

Government intervention in support of Taiwanese craft inevitably becomes entangled in these dilemmas. In 1997, the Taiwanese Council for Cultural Affairs (CCA) began promoting the "Taiwan Life Aesthetic Movement" (TLAM). The movement was meant to reshape Taiwan's cultural image, build the foundation of art aesthetics on the national level, and improve the aesthetic literacy of its citizens. Key initiatives included cultivating local aesthetics by training professionals; establishing cultural identity and national pride by holding regular workshops and themed fairs; building "art cities" with international reputations; and promoting arts, creativity, and aesthetic sensibility throughout the country. In all cases, TLAM seeks to make aesthetic living "an intimate part of every citizen's daily life" [33].

A national aesthetic sensibility cannot simply be legislated; they must be implemented throughout the country. Crafters in different regions of Taiwan have contributed by developing local and regional craft aesthetics, providing "a mold of contemporary intellectual and cultural bearings" [21, p.6]. One such implementation strategy is curricular, according to master potter Tseng:

> *"It's the government's responsibility to teach its citizens what should be considered beautiful and valuable about a craft object. This can be achieved in two parallel but related ways. First, there needs to be a systematic curriculum on aesthetic philosophy in schools. Secondly, we need to help our citizens appreciate two values associated with craft: the tangible (i.e., commercial) value and intrinsic value."*

To Master Tseng, the intrinsic value of craft is more important than its commercial value. Appreciating the intrinsic value of craft requires educational intervention: citizens must be taught to perceive and appreciate its material, formal, textural, and culturally meaningful qualities. A benefit of boosting citizens' ability to appreciate craft is to help them respect the skills and efforts of crafters, raising crafters' social status and cultural capital. But such training does not merely help crafters: it contributes to the national quali-

ty of life, as Master Tseng explained, "*the use of government power to help elevate crafters' social status ... also enhances citizens' overall aesthetic awareness*." To Master Tseng, an informed appraisal of the value of craft benefits and aesthetically enlightens the public. Tseng's perspective is thus very much in line with the public policy goals of the Taiwan Life Aesthetic Movement.

However, the government's approach to supporting craft and cultivating a national aesthetic sensibility also has its controversies. Master of lacquer art Huang, for example, is critical of governmental policies, arguing that they pursue short-term, unsustainable gains with insufficient follow-up.

> *"I never consider myself a master crafter. I am a philosopher of everyday life [生活家] foremost. The value of craft lies in enhancing the quality of one's life…. Unfortunately, the government is all for fast results at all costs. The focus should be placed on how craft helps cultivate everyday aesthetics. To me, one learns about everyday aesthetics not from schools but from early on in one's own family, by observing one's mother make a home, clean, cook, and care for the family…"*

Everyday aesthetics are reflected in everyday actions—cleaning, organizing, repairing, organizing—through which people discover and perceive the uniqueness and sensuousness of life. Master Huang is worried about high-speed nature of modern life, which she feels is antithetical to everyday aesthetics and craft. Craft is long-term, slow, and temporally irregular, making it difficult for people to cultivate an everyday aesthetic sensibility. Without that sensibility, it is hard for craft to flourish. Government needs to be more patient, she argues; current policies fail to address the deeper problem, and efforts to improve the symptoms have not made any progress. Master Huang is pessimistic about the future of craft. She says that everyday aesthetics is learned from a slow lifestyle—cooking a nice meal, spending time with family, etc.—and that this lifestyle is all but disappearing in modern Taiwan: the fight is over before it even has a chance to begin. It is possible to infer that the respective positions of Tseng (male) and Huang (female) reflect traditional gendered visions of craft, with the former advocating the use of government authority to mold society, while the latter sees the agency of change as emerging from domestic labor and care done well.

To summarize, the crafters from Taiwan demonstrated that crafts only have quality when they contribute—aesthetically and socially—to a public. Public sensibilities can and must be cultivated, in processes that can unfold at different scales: regional, national, and global.

## A SENSE FOR DESIGN QUALITY

We have so far seen how valuation is complicated by the specificities of the sociopolitical and sociocultural conditions within which practices unfold. Since the late 1980s design researchers have drawn on particular epistemologies—such as "design thinking" [9]—that complement more established approaches to technology development and assessment. Design epistemologies generally emphasize synthetic, compositional knowledge practices over analytic, rationalist ones [9,26,32]. What such approaches offer design is a broader understanding of technology development that emphasizes not only the widespread appropriation of design methods in a community, but also the tacit knowledge and skills that designers have.

Key in this treatment of interaction is how notions of quality are produced and asserted through both creative and appreciative practices. In [23], for example, Löwgren and Stolterman describe the cultivation of design ability through, among other activities, developing a "sense of quality." This sense of quality includes an insightful appreciation for and ability to create quality. Not a skill some are just born with, this "sense of quality has to be developed, continuously challenged, and improved" [p. 58]. Developing such a "skilled vision" [14] involves what Gowlland [12] would call, "more than simple visibility" [p.242]. As he notes in the context of *zisha* pottery production,

> *[I]n Dingshu, training of the senses is more than about training one's senses to recognize differences in techniques; it its also about learning to replicate certain values. [p. 243]*

This view resonates with Lave and Wenger's discussion of "ways of seeing" through *legitimate peripheral participation* wherein novices pick up new abilities—specific techniques in addition to manners of talking and acting—that facilitate their eventual membership in a community.

Building on this work, we suggest that the trained sense for quality is not conditioned independently from those for assessing workmanship or social effects. Each sense of quality is instead mutually enacted through its entanglement in practice and use. Our analysis identifies three framings of craft quality. One shared *sociomaterial* framing of pleasure in engagement with materials, one *creative-expressionist* framing of linking innovation to personal identity, and one *public* framing linking skilled use of community resources to community aesthetic sensibilities. Each vision appears to speak to interaction design in different ways.

### Interaction With Integrity

American and Taiwanese crafters both articulated concerns for sociomaterial quality, the meaningful sensory relationships that develop between material arrangements and social actors—namely, *interaction with integrity*. This vision helps us clarify how craft might contribute to concepts of quality through an under-theorized interaction design characteristics that stress the respectful material collaboration within any type of digital interaction. As such, it expands the field's critical vocabulary for reasoning about the types of culturally dense problem situations in which interaction designers now find themselves intervening, e.g., in creativity support software, in user experience design, and in tangible and embodied computing, among others. As is widely recognized, craft was appreciated for the pleasures of material engagement and social solidarity. Yet crafters also demonstrated an acute sensitivity to surrounding activities. In appreciating the integrity of workmanship we recognize

and anticipate interactional honesty and sensory pleasure, qualities that may enrich the community's capacities for critical and imaginative perception of the "particulars" [26] of a design problem space or situation and how they relate to the whole.

### The UX of Making

A framing that foregrounds creative-expressionist qualities involves ideas of identity, personal pleasure, and materials-driven emergent making. We find that understanding aesthetic interaction is an enrichment of HCI's examination of creativity software, ideas of "user" and the "self," and leisure technologies. Broadly speaking, this view allows us to theorize the user experience of making, or how people create satisfactory expressions through production.

Whether repairing broken technology or using Adobe Photoshop, a concern for creative-expressionist quality entails attending to experience, emotion, aesthetic interaction, and engagement as qualities of making. This might include diversely theorized accounts of experience [23,11], emotion [6], individual identity [37], and aesthetic interaction [0]. The creative-expressionist vision of quality focuses our attention inwards to the independent, provocative, and expressive user experiences of making.

### Socio-Cultural Productivity

In HCI, researchers are considering broader framings of stakeholders as the appropriate level of analysis, moving beyond the individual user and even teams and groups as the level of granularity for user research. Along these lines, HCI research has taken on difficult social issues, e.g., domestic violence [9]. Sustainability research in HCI combines these trends by including all of humanity present and future as a stakeholder in interaction design (i.e., because of its global ecological implications) while positioning HCI as a constituent member of the difficult social issue of environmental change [3].

As these diverse research threads come to constitute an HCI subcommunity committed to massive-stakeholder socio-cultural considerations, contributing to a repertoire of constructive concepts and examples is a short- to medium-term way of constructing theory. Insights about the relationships between making, interaction design, and the public good expand our sense of stakes and stakeholders, provide more concrete notions of long-term implications, and yield insights linking local skills to aesthetic and economic value.

## CONCLUSION

Moving forward, we offer these contributions as another step in unpacking quality in interaction design. No individual paper—nor likely even a generation of papers—can adequately account for the personal fulfillment, socio-cultural contribution, cross-cultural values, creativity, self-expression that comprise such a state. We do not seek to offer here a coherent theory of "quality" or craft. Neither do we offer a normative theory on what HCI should do, e.g., in the form of implications for design. We argue, instead, that interaction designers' best strategy for moving forward amidst this socio-cultural density is to heighten our sensitivities, to refine our perceptual capacities, and broaden our stores of useful examples.

Such an approach fits well with the increasingly complex use-situations that began emerging in the 1990s as computing increasingly participated in everyday life [20]. A practical benefit of a sense for quality is that it supports the skill of problem framing. Problem framing is the ability where designers "*name* the things to which we will attend and *frame* the context in which we will attend to them," which has the effect of "imposing] a coherence" on a design process [32, p. 40; see also 9]. Another benefit of a sense for quality is the ability to develop design solutions synthetically, using not merely reason and data, but also (expert) intuition and exploratory play with "materials, technology, and design precedents" [18, p. 43].

The present work is only one such example. By studying crafters we have begun to elucidate how deeply situated understandings of practice produce not only meaningful artifacts but also useful descriptions of their composition, appreciation and usefulness. A key aspect of this work involves recognizing that both material properties and notions of "good" workmanship are comprised and conditioned by such cultural forms. From experimenting with salt and metal techniques in the craft studio to revitalizing a local tribe of persimmon farmers, our interviewees have offered glimpses of the sociomaterial pleasures possible in interacting with integrity, the creative self-expressive possibilities of interaction, and the potential of interaction to strengthen communities in meaningful and pleasurable ways. In attending to how people make their lives "better" we may come one step closer to understanding "what that better might be" [35, p.10].

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